

APPENDIX G

COST ESTIMATES

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Models for Economic Assessment

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ECONOMIC COMPARISON OF THE OPTIONS CONSIDERED

Project: Hanna Area Transmission Plan

Date: August, 2009

Prepared By: David Michaud, Manager Regulatory Services

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I
1									
2		Description of Options Considered							
3									
4		Alternative Name	Description					Conductor Size	
5		Alternative 1 A	Double 240 kV AC looped system in Hanna Area					Twin Bundle 477 kcmil	
6		Alternative 1B	Double 240 kV AC looped system in Hanna Area					Twin Bundle 795 kcmil	
7		Alternative 2A	Single reinforced 240 kV AC Loop in Hanna Area					Twin Bundle 477 kcmil	
8		Alternative 2B	Single reinforced 240 kV AC Loop in Hanna Area					Twin Bundle 795 kcmil	
9		Alternative 3A	Single extended 240 kV AC loop in Hanna area					Twin Bundle 477 kcmil	
10		Alternative 3B	Single extended 240 kV AC loop in Hanna area					Twin Bundle 795 kcmil	
11									
12									
13		RESULTS SUMMARY - RANKING OF ALTERNATIVES							
14									
15		Rank	Alternative Name						
16		1	Alternative 3A						
17		2	Alternative 3B						
18		3	Alternative 2A						
19		4	Alternative 1A						
20		5	Alternative 2B						
21		6	Alternative 1B						
22									
23									
24									
25		Present Value of Net Cost							
26		Discounted over a 20 year period to 2012 (\$Million)							
27									
28		Rank	Alternative Name	PV Revenue Requirement	PV Losses Relative to Alternative 3B	PV Net Cost			
29		4	Alternative 1A	\$1,370	(\$26)	\$1,344			
30		6	Alternative 1B	\$1,416	(\$45)	\$1,371			
31		3	Alternative 2A	\$1,350	(\$25)	\$1,325			
32		5	Alternative 2B	\$1,399	(\$33)	\$1,365			
33		1	Alternative 3A	\$1,206	\$6	\$1,213			
34		2	Alternative 3B	\$1,250	\$0	\$1,250			
35									
36									

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		Discount Rate Used in Present Value Calculations											
3													
4		Before-tax Weighted Average Cost of Capital (Before-tax WACC)							7.36%				
5													
6		Variables:											
7		Equity%			33%								
8		Debt%			67%								
9		Cost of Debt			4.91%								
10		After-tax Return on Equity			8.75%								
11		Total Corporate Tax Rate			29%		Federal Corporate Tax Rate			19%			
12							Provincial Corporate Tax Rate			10%			
13													
14													
15													
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HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		RESULTS - Present Value of Representative Annual Revenue Requirement for Each Option											
3		Discounted over a 20 year period to 2012 (\$Million)											
4													
5						Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B		
6		Present Value Revenue Requirement				\$1,370	\$1,416	\$1,350	\$1,399	\$1,206	\$1,250		
7													
8													
9		PRESENT VALUE CALCULATION - Representative Annual Revenue Requirement											
10		Discounted over a 20 year period to 2012 (\$Million)											
11													
12				Present		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
13				Value		2012	2013	2014	2015	2016	2017	2018	2019
14		Alternative 1 A		\$1,370		\$96	\$108	\$106	\$104	\$102	\$132	\$154	\$151
15		Alternative 1B		\$1,416		\$99	\$111	\$109	\$107	\$105	\$136	\$160	\$156
16		Alternative 2A		\$1,350		\$109	\$123	\$121	\$119	\$116	\$130	\$139	\$137
17		Alternative 2B		\$1,399		\$113	\$127	\$125	\$122	\$120	\$134	\$145	\$142
18		Alternative 3A		\$1,206		\$97	\$109	\$107	\$105	\$103	\$116	\$125	\$122
19		Alternative 3B		\$1,250		\$101	\$113	\$111	\$109	\$107	\$120	\$130	\$127
20													
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HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
37		CAPITAL COST ESCALATION (\$million)											
38													
39		ALTERNATIVE 1A											
40				2009	2010	2011	2012	2013	2014	2015	2016	2017	
41		Stage 1	ATCO	\$606	\$636	\$668	\$702						
42			AltaLink	205	215	226	237						
43			TOTAL	\$811	\$851	\$894	\$939						
44													
45		Stage 2	ATCO	\$308	\$324	\$340	\$357	\$375	\$394	\$413	\$434	\$456	
46			AltaLink	19	20	21	22	23	24	25	27	28	
47			TOTAL	\$327	\$344	\$361	\$379	\$398	\$418	\$439	\$460	\$483	
48													
49		ALTERNATIVE 1B											
50				2009	2010	2011	2012	2013	2014	2015	2016	2017	
51		Stage 1	ATCO	\$629	\$661	\$694	\$728						
52			AltaLink	205	215	226	237						
53			TOTAL	\$834	\$876	\$919	\$965						
54													
55		Stage 2	ATCO	\$325	\$341	\$358	\$376	\$395	\$415	\$436	\$457	\$480	
56			AltaLink	19	20	21	22	23	24	25	27	28	
57			TOTAL	\$344	\$361	\$379	\$398	\$418	\$439	\$461	\$484	\$508	
58													
59		ALTERNATIVE 2A											
60				2009	2010	2011	2012	2013	2014	2015	2016	2017	
61		Stage 1	ATCO	\$718	\$754	\$791	\$831						
62			AltaLink	205	215	226	237						
63			TOTAL	\$922	\$969	\$1,017	\$1,068						
64													
65		Stage 2	ATCO	\$143	\$150	\$157	\$165	\$173	\$182	\$191	\$201	\$211	
66			AltaLink	19	20	21	22	23	24	25	27	28	
67			TOTAL	\$161	\$170	\$178	\$187	\$196	\$206	\$216	\$227	\$239	
68													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
69		(Continued) CAPITAL COST ESCALATION (\$million)											
70													
71		ALTERNATIVE 2B											
72				2009	2010	2011	2012	2013	2014	2015	2016	2017	
73		Stage 1	ATCO	\$747	\$784	\$823	\$864						
74			AltaLink	205	215	226	237						
75			TOTAL	\$951	\$999	\$1,049	\$1,101						
76													
77		Stage 2	ATCO	\$154	\$162	\$170	\$178	\$187	\$197	\$206	\$217	\$228	
78			AltaLink	19	20	21	22	23	24	25	27	28	
79			TOTAL	\$173	\$182	\$191	\$200	\$210	\$221	\$232	\$243	\$255	
80													
81		ALTERNATIVE 3A											
82				2009	2010	2011	2012	2013	2014	2015	2016	2017	
83		Stage 1	ATCO	\$615	\$646	\$678	\$712						
84			AltaLink	205	215	226	237						
85			TOTAL	\$820	\$861	\$904	\$950						
86													
87		Stage 2	ATCO	\$131	\$137	\$144	\$151	\$159	\$167	\$175	\$184	\$193	
88			AltaLink	19	20	21	22	23	24	25	27	28	
89			TOTAL	\$149	\$157	\$165	\$173	\$182	\$191	\$200	\$210	\$221	
90													
91		ALTERNATIVE 3B											
92				2009	2010	2011	2012	2013	2014	2015	2016	2017	
93		Stage 1	ATCO	\$644	\$676	\$710	\$745						
94			AltaLink	205	215	226	237						
95			TOTAL	\$849	\$891	\$936	\$983						
96													
97		Stage 2	ATCO	\$138	\$145	\$152	\$159	\$167	\$176	\$185	\$194	\$203	
98			AltaLink	19	20	21	22	23	24	25	27	28	
99			TOTAL	\$157	\$164	\$173	\$181	\$190	\$200	\$210	\$220	\$231	
100													
101		ANNUAL ESCALATION RATES PROVIDED BY TFOS											
102													
103				2009	2010	2011	2012	2013	2014	2015	2016	2017	
104		ATCO		0%	5%	5%	5%	5%	5%	5%	5%	5%	
105		AltaLink		0%	5%	5%	5%	5%	5%	5%	5%	5%	
106													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
107		Calculation of Representative Revenue Requirement Estimates for each Option											
108													
109		Variables:											
110		Operating Expense Factor			1.50%								
111		Depreciation Rate			2.88%								
112													
113		ALTERNATIVE 1A											
114													
115						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
116		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
117		Operating expense				\$14.08	\$14.08	\$14.08	\$14.08	\$14.08	\$21.33	\$21.33	\$21.33
118		Depreciation				\$13.52	\$27.04	\$27.04	\$27.04	\$27.04	\$34.00	\$40.96	\$40.96
119		Income Tax				\$11.00	\$10.76	\$10.44	\$10.12	\$9.80	\$12.29	\$14.70	\$14.22
120		Debt Costs				\$30.66	\$29.99	\$29.10	\$28.21	\$27.33	\$34.27	\$40.99	\$39.65
121		Equity Return				\$26.92	\$26.34	\$25.56	\$24.78	\$24.00	\$30.10	\$36.00	\$34.81
122		TOTAL				\$96.18	\$108.21	\$106.22	\$104.23	\$102.24	\$132.00	\$153.99	\$150.97
123													
124		Additional Calculations:											
125													
126						2012	2013	2014	2015	2016	2017	2018	2019
127		Capital Costs Incurred (\$ISD, \$Million)				\$938.78	0	0	0	0	\$483.46	0	0
128													
129		Plant Capital Costs											
130		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$938.78	\$938.78	\$938.78	\$938.78	\$938.78	\$1,422.24	\$1,422.24
131		End, Plant Capital Costs (\$ISD, \$Million)				\$938.78	\$938.78	\$938.78	\$938.78	\$938.78	\$1,422.24	\$1,422.24	\$1,422.24
132													
133		Depreciation (\$Million)											
134		Accumulated Depr'cn (Opening)				0.00	13.52	40.56	67.59	94.63	121.67	155.66	196.62
135		Annual Depreciation				13.52	27.04	27.04	27.04	27.04	34.00	40.96	40.96
136		Accumulated Depr'cn (Ending)				13.52	40.56	67.59	94.63	121.67	155.66	196.62	237.58
137													
138		Rate Base Amount (\$Million)											
139		Rate Base Amount (Opening)				\$938.78	\$925.26	\$898.22	\$871.18	\$844.15	\$817.11	\$1,266.58	\$1,225.62
140		Rate Base Amount (Ending)				\$925.26	\$898.22	\$871.18	\$844.15	\$817.11	\$1,266.58	\$1,225.62	\$1,184.65
141		Rate Base (Mid-Year)				\$932.02	\$911.74	\$884.70	\$857.67	\$830.63	\$1,041.84	\$1,246.10	\$1,205.13
142													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
143		ALTERNATIVE 1B											
144													
145						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
146		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
147		Operating expense				\$14.48	\$14.48	\$14.48	\$14.48	\$14.48	\$22.10	\$22.10	\$22.10
148		Depreciation				\$13.90	\$27.80	\$27.80	\$27.80	\$27.80	\$35.12	\$42.44	\$42.44
149		Income Tax				\$11.31	\$11.06	\$10.73	\$10.41	\$10.08	\$12.70	\$15.25	\$14.74
150		Debt Costs				\$31.53	\$30.84	\$29.93	\$29.01	\$28.10	\$35.42	\$42.50	\$41.11
151		Equity Return				\$27.69	\$27.08	\$26.28	\$25.48	\$24.67	\$31.10	\$37.32	\$36.10
152		TOTAL				\$98.90	\$111.27	\$109.22	\$107.18	\$105.13	\$136.45	\$159.61	\$156.49
153													
154		Additional Calculations:											
155													
156						2012	2013	2014	2015	2016	2017	2018	2019
157		Capital Costs Incurred (\$ISD, \$Million)				\$965.32	0	0	0	0	\$508.14	0	0
158													
159		Plant Capital Costs											
160		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$965.32	\$965.32	\$965.32	\$965.32	\$965.32	\$1,473.47	\$1,473.47
161		End, Plant Capital Costs (\$ISD, \$Million)				\$965.32	\$965.32	\$965.32	\$965.32	\$965.32	\$1,473.47	\$1,473.47	\$1,473.47
162													
163		Depreciation (\$Million)											
164		Accumulated Depr'cn (Opening)				0.00	13.90	41.70	69.50	97.30	125.11	160.22	202.66
165		Annual Depreciation				13.90	27.80	27.80	27.80	27.80	35.12	42.44	42.44
166		Accumulated Depr'cn (Ending)				13.90	41.70	69.50	97.30	125.11	160.22	202.66	245.10
167													
168		Rate Base Amount (\$Million)											
169		Rate Base Amount (Opening)				\$965.32	\$951.42	\$923.62	\$895.82	\$868.02	\$840.22	\$1,313.24	\$1,270.81
170		Rate Base Amount (Ending)				\$951.42	\$923.62	\$895.82	\$868.02	\$840.22	\$1,313.24	\$1,270.81	\$1,228.37
171		Rate Base (Mid-Year)				\$958.37	\$937.52	\$909.72	\$881.92	\$854.12	\$1,076.73	\$1,292.02	\$1,249.59
172													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
173		ALTERNATIVE 2A											
174													
175						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
176		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
177		Operating expense				\$16.02	\$16.02	\$16.02	\$16.02	\$16.02	\$19.60	\$19.60	\$19.60
178		Depreciation				\$15.38	\$30.76	\$30.76	\$30.76	\$30.76	\$34.19	\$37.63	\$37.63
179		Income Tax				\$12.51	\$12.24	\$11.87	\$11.51	\$11.15	\$12.17	\$13.16	\$12.71
180		Debt Costs				\$34.88	\$34.12	\$33.11	\$32.10	\$31.08	\$33.94	\$36.68	\$35.44
181		Equity Return				\$30.63	\$29.96	\$29.07	\$28.18	\$27.30	\$29.80	\$32.21	\$31.12
182		TOTAL				\$109.41	\$123.09	\$120.83	\$118.56	\$116.30	\$129.70	\$139.27	\$136.50
183													
184		Additional Calculations:											
185													
186						2012	2013	2014	2015	2016	2017	2018	2019
187		Capital Costs Incurred (\$ISD, \$Million)				\$1,067.89	0	0	0	0	\$238.55	0	0
188													
189		Plant Capital Costs											
190		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$1,067.89	\$1,067.89	\$1,067.89	\$1,067.89	\$1,067.89	\$1,306.44	\$1,306.44
191		End, Plant Capital Costs (\$ISD, \$Million)				\$1,067.89	\$1,067.89	\$1,067.89	\$1,067.89	\$1,067.89	\$1,306.44	\$1,306.44	\$1,306.44
192													
193		Depreciation (\$Million)											
194		Accumulated Depr'cn (Opening)				0.00	15.38	46.13	76.89	107.64	138.40	172.59	210.21
195		Annual Depreciation				15.38	30.76	30.76	30.76	30.76	34.19	37.63	37.63
196		Accumulated Depr'cn (Ending)				15.38	46.13	76.89	107.64	138.40	172.59	210.21	247.84
197													
198		Rate Base Amount (\$Million)											
199		Rate Base Amount (Opening)				\$1,067.89	\$1,052.52	\$1,021.76	\$991.00	\$960.25	\$929.49	\$1,133.85	\$1,096.23
200		Rate Base Amount (Ending)				\$1,052.52	\$1,021.76	\$991.00	\$960.25	\$929.49	\$1,133.85	\$1,096.23	\$1,058.60
201		Rate Base (Mid-Year)				\$1,060.20	\$1,037.14	\$1,006.38	\$975.63	\$944.87	\$1,031.67	\$1,115.04	\$1,077.41
202													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
203		ALTERNATIVE 2B											
204													
205						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
206		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
207		Operating expense				\$16.52	\$16.52	\$16.52	\$16.52	\$16.52	\$20.35	\$20.35	\$20.35
208		Depreciation				\$15.86	\$31.72	\$31.72	\$31.72	\$31.72	\$35.40	\$39.07	\$39.07
209		Income Tax				\$12.90	\$12.62	\$12.25	\$11.87	\$11.50	\$12.61	\$13.68	\$13.22
210		Debt Costs				\$35.97	\$35.19	\$34.14	\$33.10	\$32.06	\$35.15	\$38.13	\$36.85
211		Equity Return				\$31.59	\$30.90	\$29.98	\$29.07	\$28.15	\$30.87	\$33.48	\$32.36
212		TOTAL				\$112.84	\$126.95	\$124.61	\$122.28	\$119.95	\$134.38	\$144.72	\$141.84
213													
214		Additional Calculations:											
215													
216						2012	2013	2014	2015	2016	2017	2018	2019
217		Capital Costs Incurred (\$ISD, \$Million)				\$1,101.35	0	0	0	0	\$255.42	0	0
218													
219		Plant Capital Costs											
220		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$1,101.35	\$1,101.35	\$1,101.35	\$1,101.35	\$1,101.35	\$1,356.77	\$1,356.77
221		End, Plant Capital Costs (\$ISD, \$Million)				\$1,101.35	\$1,101.35	\$1,101.35	\$1,101.35	\$1,101.35	\$1,356.77	\$1,356.77	\$1,356.77
222													
223		Depreciation (\$Million)											
224		Accumulated Depr'cn (Opening)				0.00	15.86	47.58	79.30	111.02	142.73	178.13	217.21
225		Annual Depreciation				15.86	31.72	31.72	31.72	31.72	35.40	39.07	39.07
226		Accumulated Depr'cn (Ending)				15.86	47.58	79.30	111.02	142.73	178.13	217.21	256.28
227													
228		Rate Base Amount (\$Million)											
229		Rate Base Amount (Opening)				\$1,101.35	\$1,085.49	\$1,053.77	\$1,022.05	\$990.33	\$958.61	\$1,178.64	\$1,139.56
230		Rate Base Amount (Ending)				\$1,085.49	\$1,053.77	\$1,022.05	\$990.33	\$958.61	\$1,178.64	\$1,139.56	\$1,100.49
231		Rate Base (Mid-Year)				\$1,093.42	\$1,069.63	\$1,037.91	\$1,006.19	\$974.47	\$1,068.63	\$1,159.10	\$1,120.03
232													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
233		ALTERNATIVE 3A											
234													
235						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
236		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
237		Operating expense				\$14.24	\$14.24	\$14.24	\$14.24	\$14.24	\$17.56	\$17.56	\$17.56
238		Depreciation				\$13.67	\$27.35	\$27.35	\$27.35	\$27.35	\$30.53	\$33.71	\$33.71
239		Income Tax				\$11.12	\$10.88	\$10.56	\$10.24	\$9.91	\$10.87	\$11.80	\$11.40
240		Debt Costs				\$31.01	\$30.34	\$29.44	\$28.54	\$27.64	\$30.32	\$32.90	\$31.79
241		Equity Return				\$27.23	\$26.64	\$25.85	\$25.06	\$24.27	\$26.62	\$28.89	\$27.91
242		TOTAL				\$97.28	\$109.44	\$107.43	\$105.42	\$103.41	\$115.90	\$124.84	\$122.36
243													
244		Additional Calculations:											
245													
246						2012	2013	2014	2015	2016	2017	2018	2019
247		Capital Costs Incurred (\$ISD, \$Million)				\$949.50	0	0	0	0	\$220.88	0	0
248													
249		Plant Capital Costs											
250		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$949.50	\$949.50	\$949.50	\$949.50	\$949.50	\$1,170.38	\$1,170.38
251		End, Plant Capital Costs (\$ISD, \$Million)				\$949.50	\$949.50	\$949.50	\$949.50	\$949.50	\$1,170.38	\$1,170.38	\$1,170.38
252													
253		Depreciation (\$Million)											
254		Accumulated Depr'cn (Opening)				0.00	13.67	41.02	68.36	95.71	123.06	153.58	187.29
255		Annual Depreciation				13.67	27.35	27.35	27.35	27.35	30.53	33.71	33.71
256		Accumulated Depr'cn (Ending)				13.67	41.02	68.36	95.71	123.06	153.58	187.29	221.00
257													
258		Rate Base Amount (\$Million)											
259		Rate Base Amount (Opening)				\$949.50	\$935.83	\$908.48	\$881.14	\$853.79	\$826.45	\$1,016.80	\$983.09
260		Rate Base Amount (Ending)				\$935.83	\$908.48	\$881.14	\$853.79	\$826.45	\$1,016.80	\$983.09	\$949.38
261		Rate Base (Mid-Year)				\$942.67	\$922.16	\$894.81	\$867.46	\$840.12	\$921.62	\$999.94	\$966.24
262													

HANNA AREA TRANSMISSION PLAN
ECONOMIC COMPARISON OF OPTIONS CONSIDERED

	A	B	C	D	E	F	G	H	I	J	K	L	M
263		ALTERNATIVE 3B											
264													
265						Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
266		Revenue Requirement (\$Million)				2012	2013	2014	2015	2016	2017	2018	2019
267		Operating expense				\$14.74	\$14.74	\$14.74	\$14.74	\$14.74	\$18.21	\$18.21	\$18.21
268		Depreciation				\$14.15	\$28.30	\$28.30	\$28.30	\$28.30	\$31.63	\$34.96	\$34.96
269		Income Tax				\$11.51	\$11.26	\$10.93	\$10.59	\$10.26	\$11.27	\$12.24	\$11.83
270		Debt Costs				\$32.09	\$31.39	\$30.46	\$29.53	\$28.60	\$31.42	\$34.13	\$32.98
271		Equity Return				\$28.18	\$27.57	\$26.75	\$25.93	\$25.11	\$27.59	\$29.97	\$28.96
272		TOTAL				\$100.67	\$113.25	\$111.17	\$109.09	\$107.01	\$120.12	\$129.51	\$126.94
273													
274		Additional Calculations:											
275													
276						2012	2013	2014	2015	2016	2017	2018	2019
277		Capital Costs Incurred (\$ISD, \$Million)				\$982.53	0	0	0	0	\$231.39	0	0
278													
279		Plant Capital Costs											
280		Beg., Plant Capital Costs (\$ISD, \$Million)				\$0.00	\$982.53	\$982.53	\$982.53	\$982.53	\$982.53	\$1,213.92	\$1,213.92
281		End, Plant Capital Costs (\$ISD, \$Million)				\$982.53	\$982.53	\$982.53	\$982.53	\$982.53	\$1,213.92	\$1,213.92	\$1,213.92
282													
283		Depreciation (\$Million)											
284		Accumulated Depr'cn (Opening)				0.00	14.15	42.45	70.74	99.04	127.34	158.97	193.93
285		Annual Depreciation				14.15	28.30	28.30	28.30	28.30	31.63	34.96	34.96
286		Accumulated Depr'cn (Ending)				14.15	42.45	70.74	99.04	127.34	158.97	193.93	228.89
287													
288		Rate Base Amount (\$Million)											
289		Rate Base Amount (Opening)				\$982.53	\$968.38	\$940.09	\$911.79	\$883.49	\$855.20	\$1,054.96	\$1,020.00
290		Rate Base Amount (Ending)				\$968.38	\$940.09	\$911.79	\$883.49	\$855.20	\$1,054.96	\$1,020.00	\$985.04
291		Rate Base (Mid-Year)				\$975.46	\$954.24	\$925.94	\$897.64	\$869.34	\$955.08	\$1,037.48	\$1,002.52
292													
293													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1																									
2		RESULTS - Present Value of the Value of Losses for Each Option																							
3		Discounted over a 20 year period to 2012 (\$Million)																							
4																									
5							Alt 1A	Alt 1B	Alt 2A	Alt 2B	Alt 3A	Alt 3B													
6		Present Value Losses					-\$26	-\$45	-\$25	-\$33	\$6	\$0													
7																									
8																									
9		PRESENT VALUE CALCULATION - Losses																							
10		Discounted over a 20 year period to 2012 (\$Million)																							
11																									
12			Present																						
13			Value		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
14		Alternative 1 A	-\$26.49		-\$0.27	-\$0.48	-\$0.66	-\$0.89	-\$1.29	-\$1.67	-\$1.97	-\$2.21	-\$2.50	-\$2.78	-\$2.99	-\$3.46	-\$3.91	-\$4.30	-\$4.83	-\$5.50	-\$5.40	-\$5.90	-\$5.92	-\$6.05	
15		Alternative 1 B	-\$44.80		-\$0.63	-\$0.96	-\$1.25	-\$1.62	-\$2.29	-\$2.91	-\$3.39	-\$3.76	-\$4.22	-\$4.66	-\$4.99	-\$5.76	-\$6.49	-\$7.11	-\$7.97	-\$9.05	-\$8.86	-\$9.67	-\$9.69	-\$9.91	
16		Alternative 2A	-\$24.65		-\$0.25	-\$0.44	-\$0.62	-\$0.83	-\$1.20	-\$1.55	-\$1.83	-\$2.05	-\$2.32	-\$2.58	-\$2.78	-\$3.22	-\$3.64	-\$4.00	-\$4.50	-\$5.12	-\$5.02	-\$5.49	-\$5.51	-\$5.63	
17		Alternative 2B	-\$33.44		-\$0.51	-\$0.75	-\$0.96	-\$1.23	-\$1.73	-\$2.19	-\$2.54	-\$2.81	-\$3.15	-\$3.48	-\$3.72	-\$4.28	-\$4.82	-\$5.28	-\$5.91	-\$6.71	-\$6.56	-\$7.16	-\$7.17	-\$7.33	
18		Alternative 3A	\$6.29		\$0.20	\$0.23	\$0.25	\$0.29	\$0.38	\$0.46	\$0.51	\$0.54	\$0.59	\$0.64	\$0.67	\$0.75	\$0.84	\$0.90	\$1.00	\$1.12	\$1.09	\$1.17	\$1.17	\$1.19	
19		Alternative 3B	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
20																									
21																									
22		Estimated Annual Losses (GWh)																							
23																									
24			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20			
25			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
26		Alternative 1 A	3,010	3,095	3,180	3,265	3,349	3,434	3,519	3,604	3,689	3,773	3,858	3,943	4,028	4,112	4,197	4,282	4,367	4,452	4,536	4,536			
27		Alternative 1 B	3,006	3,089	3,172	3,256	3,339	3,422	3,505	3,589	3,672	3,755	3,838	3,922	4,005	4,088	4,172	4,255	4,338	4,421	4,505	4,505			
28		Alternative 2A	3,010	3,095	3,180	3,265	3,350	3,435	3,520	3,605	3,690	3,775	3,860	3,945	4,030	4,115	4,200	4,285	4,370	4,455	4,540	4,540			
29		Alternative 2B	3,007	3,092	3,176	3,260	3,345	3,429	3,514	3,598	3,682	3,767	3,851	3,935	4,020	4,104	4,188	4,273	4,357	4,441	4,526	4,526			
30		Alternative 3A	3,016	3,104	3,191	3,279	3,367	3,455	3,543	3,630	3,718	3,806	3,894	3,982	4,069	4,157	4,245	4,333	4,420	4,508	4,596	4,596			
31		Alternative 3B	3,013	3,101	3,188	3,276	3,363	3,450	3,538	3,625	3,712	3,800	3,887	3,975	4,062	4,149	4,237	4,324	4,411	4,499	4,586	4,586			
32																									
33		Estimated Annual Losses Relative to Alternative 3B (GWh)																							
34																									
35			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20			
36			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
37		Alternative 1 A	-3	-6	-8	-11	-14	-16	-19	-21	-24	-27	-29	-32	-34	-37	-40	-42	-45	-47	-50	-50			
38		Alternative 1 B	-8	-12	-16	-20	-24	-28	-32	-36	-41	-45	-49	-53	-57	-61	-65	-69	-73	-78	-82	-82			
39		Alternative 2A	-3	-5	-8	-10	-13	-15	-17	-20	-22	-25	-27	-30	-32	-34	-37	-39	-42	-44	-46	-46			
40		Alternative 2B	-6	-9	-12	-15	-18	-21	-24	-27	-30	-33	-36	-39	-42	-45	-48	-51	-54	-57	-60	-60			
41		Alternative 3A	2	3	3	4	4	4	5	5	6	6	7	7	7	8	8	9	9	9	10	10			
42		Alternative 3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
43																									
44			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
45		Forecast Pool Price	\$83.22	\$82.12	\$79.05	\$81.45	\$95.13	\$103.20	\$104.89	\$103.36	\$104.24	\$104.53	\$102.50	\$108.94	\$113.98	\$116.47	\$122.28	\$130.63	\$120.68	\$124.70	\$118.72	\$121.33			
46		(Source: EDC Associated Ltd., 07-28-2009)																							
47																									
48																									
49		Alberta Consumer Price Index (2002 = 1.0)																							
50		(Source for the CPI and inflation% forecasts: The Conference Board of Canada, Provincial Outlook 2009 Long-Term Economic Forecast, pages 97 and 98 - Forecast completed January 28, 2009)																							
51																									
52																									
53			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
54		CPI	1.334	1.363	1.391	1.418	1.447	1.476	1.505	1.536	1.567	1.598	1.630	1.662	1.695	1.728	1.762	1.797	1.834	1.873	1.913	1.955			
55		Inflation %	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2			

Note for Capital Cost Estimates

This appendix contains capital cost estimates provided by TFOs (ATCO and AltaLink) for facilities included in the recommended alternative as well as other alternatives. Capital cost estimates are given in 2009 dollars. Organization of the capital cost estimates for the recommended alternative is outlined below:

- (i) ATCO cost estimates: Capital costs labeled from Stage 1 through Stage 4 are part of Stage I (in-service by 2012) of the NID application. Accordingly, ATCO cost estimates labeled as Stage 5 belong to Stage II (in-service by 2017) of the application;
- (ii) AltaLink cost estimates: Each “development” is an individual component in the alternatives and hence belong to either Stage I or Stage II of the NID application.

Capital cost estimates for other alternatives are organized by each TFO.

RECOMMENDED ALTERNATIVE

Stage I (2012)

Estimate Summary for Need Identification Document (NID)

Project: **Hanna Area Transmission
Development - Alternative 3b Stage 1
(Dec-2012) Revised version as per
AESO request**

TFO: ATCO Electric

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

NID Estimate is valid for 90 days from Aug 06, 2009

+/- 30 %



THE POWER OF POSSIBILITY

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 80,522,881	\$ -	\$ 80,522,881	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 167,334,541	\$ -	\$ 167,334,541	\$ -
Owners Costs	\$ 15,728,984	\$ -	\$ 15,728,984	\$ -
Distributed Costs	\$ 12,276,691	\$ -	\$ 12,276,691	\$ -
Contingency	\$ 19,534,022	\$ -	\$ 19,534,022	\$ -
Total Owners and Dist. Costs	\$ 47,539,697	\$ -	\$ 47,539,697	\$ -
Total Direct Costs	\$ 214,874,238	\$ -	\$ 214,874,238	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 17,189,939	\$ -	\$ 17,189,939	\$ -
AFUDC	\$ 16,708,621	\$ -	\$ 16,708,621	\$ -
Total Indirect Costs	\$ 33,898,560	\$ -	\$ 33,898,560	\$ -
TOTAL PROJECT COSTS	\$ 248,772,797	\$ -	\$ 248,772,797	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3b Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 795 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 31,608,180	\$ -	\$ 31,608,180	\$ -
	Materials	\$ 12,357,180	\$ -	\$ 12,357,180	\$ -
	Sub - Total	\$ 43,965,360	\$ -	\$ 43,965,360	\$ -
D/C 2x 795 mcm 240 kV with one side strung Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,937,400	\$ -	\$ 3,937,400	\$ -
	Materials	\$ 1,684,228	\$ -	\$ 1,684,228	\$ -
	Sub - Total	\$ 5,621,628	\$ -	\$ 5,621,628	\$ -
D/C 2x 795 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 19,258,501	\$ -	\$ 19,258,501	\$ -
	Materials	\$ 7,826,206	\$ -	\$ 7,826,206	\$ -
	Sub - Total	\$ 27,084,707	\$ -	\$ 27,084,707	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 80,522,881	\$ -	\$ 80,522,881	\$ -

Substation - NID Estimate

Alt 3b Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
946S Oakland Substation				
Circuit Breakers (4x 240kV)	\$ 1,600,000	\$ -	\$ 1,600,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 5,000,000	\$ -	\$ 5,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -

|

Telecommunication NID Estimate

Alt 3b Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation					
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation					
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -
Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200	\$ -
	Sub - Total	\$ 538,900	\$ -	\$ 538,900	\$ -
Fleet-Lonepine 7 GHz Upgrade					
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 348,800	\$ -	\$ 348,800	\$ -
Fleet-Consort 7 GHz Upgrade					
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 379,800	\$ -	\$ 379,800	\$ -
774S Monitor Substation					
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 263,740	\$ -	\$ 263,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660	\$ -

Estimate Summary for Need Identification Document (NID)

Project: **Hanna Area Transmission
Development - Alternative 3b Stage 2
(Dec-2012) Revised version as per
AESO request**

TFO: ATCO Electric

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

NID Estimate is valid for 90 days from Aug 06, 2009

+/- 30 %



THE POWER OF POSSIBILITY

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 117,418,541	\$ -	\$ 117,418,541	\$ -
Substation Facilities	\$ 71,450,000	\$ -	\$ 71,450,000	\$ -
Telecommunication	\$ 2,332,380	\$ -	\$ 2,332,380	\$ -
Total Facility Costs	\$ 191,200,921	\$ -	\$ 191,200,921	\$ -
Owners Costs	\$ 14,602,557	\$ -	\$ 14,602,557	\$ -
Distributed Costs	\$ 9,210,914	\$ -	\$ 9,210,914	\$ -
Contingency	\$ 21,501,439	\$ -	\$ 21,501,439	\$ -
Total Owners and Dist. Costs	\$ 45,314,910	\$ -	\$ 45,314,910	\$ -
Total Direct Costs	\$ 236,515,831	\$ -	\$ 236,515,831	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 18,921,266	\$ -	\$ 18,921,266	\$ -
AFUDC	\$ 18,391,471	\$ -	\$ 18,391,471	\$ -
Total Indirect Costs	\$ 37,312,738	\$ -	\$ 37,312,738	\$ -
TOTAL PROJECT COSTS	\$ 273,828,569	\$ -	\$ 273,828,569	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3b Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C 2x 795 mcm 240 kV with one side strung from Lanfine to Oakland (9L24)	87 Km				
	Labour	\$ 44,091,832	\$ -	\$ 44,091,832	\$ -
	Materials	\$ 17,917,892	\$ -	\$ 17,917,892	\$ -
	Sub - Total	\$ 62,009,724	\$ -	\$ 62,009,724	\$ -
D/C one side string 2x 795 mcm 240 kV from Lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 35,822,604	\$ -	\$ 35,822,604	\$ -
	Materials	\$ 14,004,804	\$ -	\$ 14,004,804	\$ -
	Sub - Total	\$ 49,827,408	\$ -	\$ 49,827,408	\$ -
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km				
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025	\$ -
	Materials	\$ 529,198	\$ -	\$ 529,198	\$ -
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223	\$ -
D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 117,418,541	\$ -	\$ 117,418,541	\$ -

Substation - NID Estimate

Alt 3b Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200 MVAR, 144/44kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 1x 144kV 30MVar	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
932S Pemukan Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000	\$ -
946S Oakland Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
910S Excel Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
TOTAL - Substation Project Costs	\$ 71,450,000	\$ -	\$ 71,450,000	\$ -

Telecommunication NID Estimate

Alt 3b Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
771S Veteran Sub					
	Tower/Antenna	\$ 74,100	\$ -	\$ 74,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
959S Lanfine Substation					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -

Pollocl- Cappon 7 GHz				
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800
	Sub - Total	\$ 341,800	\$ -	\$ 341,800
TOTAL - Telecommunication Project Costs		\$ 2,332,380	\$ -	\$ 2,332,380

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Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

**Project: Hanna Area Transmission
Development - Alternative 3b Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 24,180,000	\$ -	\$ 24,180,000	\$ -
Telecommunication	\$ 912,400	\$ -	\$ 912,400	\$ -
Total Facility Costs	\$ 40,318,579	\$ -	\$ 40,318,579	\$ -
Owners Costs	\$ 3,512,468	\$ -	\$ 3,512,468	\$ -
Distributed Costs	\$ 2,468,287	\$ -	\$ 2,468,287	\$ -
Contingency	\$ 6,094,933	\$ -	\$ 6,094,933	\$ -
Total Owners and Dist. Costs	\$ 12,075,688	\$ -	\$ 12,075,688	\$ -
Total Direct Costs	\$ 52,394,267	\$ -	\$ 52,394,267	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,363,541	\$ -	\$ 5,363,541	\$ -
AFUDC	\$ 5,213,362	\$ -	\$ 5,213,362	\$ -
Total Indirect Costs	\$ 25,226,904	\$ -	\$ 25,226,904	\$ -
TOTAL PROJECT COSTS	\$ 77,621,171	\$ -	\$ 77,621,171	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3b Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L224)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
Salvage 7L98, 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
Tap from 7L16 and build a double circuit (7L16 & 7L159) to new Delburne substation.	3 Km				
	Labour	\$ 438,230	\$ -	\$ 438,230	\$ -
	Materials	\$ 153,819	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 592,049	\$ -
Tap from 7L25 and build a D/C (7L25 & 7L137) to new or expanded Rowley substation	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 4,440,366	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 3b Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar,144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 1,390,000	\$ -	\$ 1,390,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
New Delburne Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	
Circuit Breakers (2x 144 kV)	\$ 360,000	\$ -	\$ 360,000	
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
New Rowley Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144 kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
963S Coyote Lake Substation				

Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ 1
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 24,180,000	\$ -	\$ 24,180,000	\$ -
TOTAL - Salvage Cost	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

Alt 3 Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
802S Michichi Creek Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
Drum - Wintering 2GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Wintering - Ander 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
TOTAL - Telecommunication Project Costs		\$ 912,400	\$ -	\$ 912,400	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3b Stage 4
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -
Telecommunication	\$ 1,485,654	\$ -	\$ 1,485,654	\$ -
Total Facility Costs	\$ 25,315,381	\$ -	\$ 25,315,381	\$ -
Owners Costs	\$ 2,027,400	\$ -	\$ 2,027,400	\$ -
Distributed Costs	\$ 1,227,060	\$ -	\$ 1,227,060	\$ -
Contingency	\$ 3,431,984	\$ -	\$ 3,431,984	\$ -
Total Owners and Dist. Costs	\$ 6,686,444	\$ -	\$ 6,686,444	\$ -
Total Direct Costs	\$ 32,001,825	\$ -	\$ 32,001,825	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 3,020,146	\$ -	\$ 3,020,146	\$ -
AFUDC	\$ 2,935,582	\$ -	\$ 2,935,582	\$ -
Total Indirect Costs	\$ 11,705,728	\$ -	\$ 11,705,728	\$ -
TOTAL PROJECT COSTS	\$ 43,707,553	\$ -	\$ 43,707,553	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

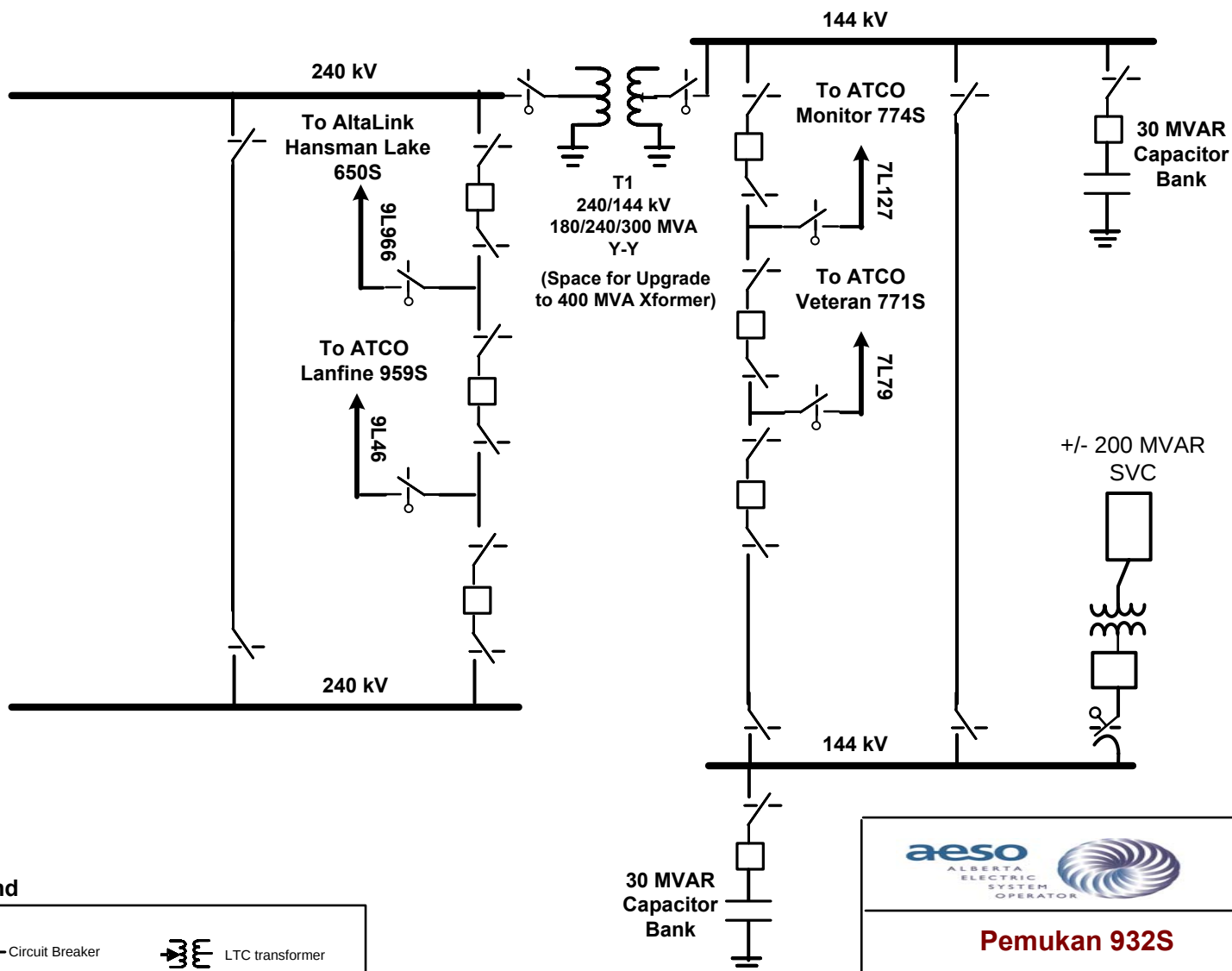
Alternative 3b Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 Km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 3b Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank (1x144kV, 15 Mvar)	\$ 450,000	\$ -	\$ 450,000	
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ -
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 150,000	\$ -	\$ 150,000	\$ -
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000	\$ -
959S Lanfine Substation				
Capacitor Bank (1x144kV 30 Mvar)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
TOTAL - Substation Project Costs	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -

Telecommunication NID Estimate

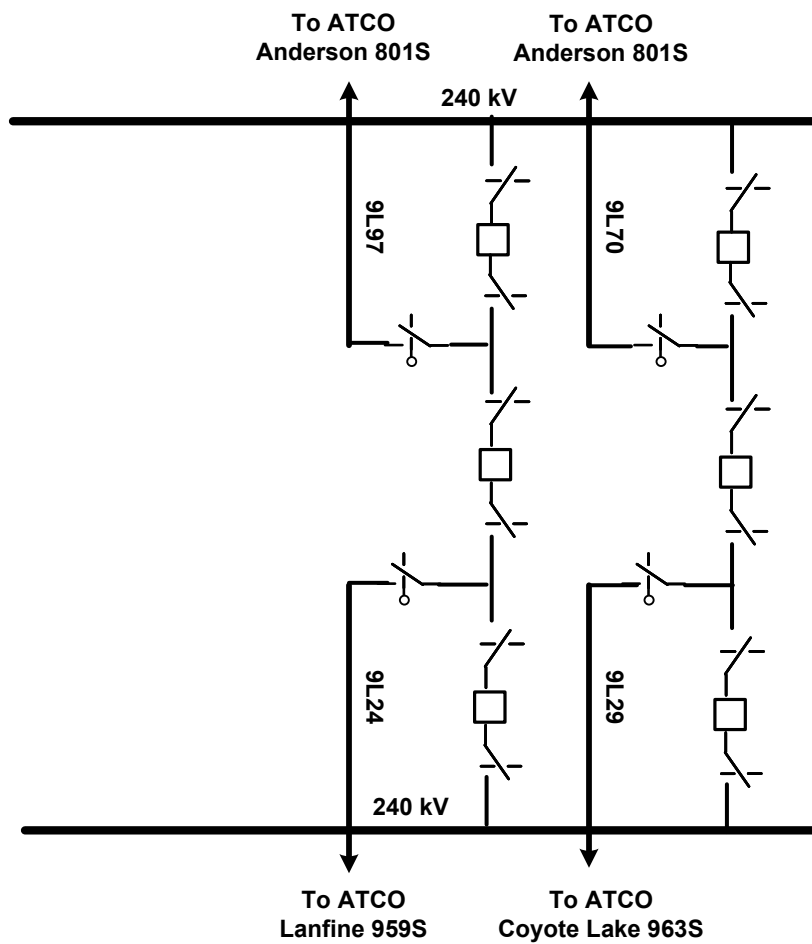
Alt 3b Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
768S Rowley Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S Delburne Sub					
	Tower/Antenna	\$ 129,690	\$ -	\$ 129,690	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 143,088	\$ -	\$ 143,088	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 50,116	\$ -	\$ 50,116	\$ -
	Sub - Total	\$ 322,894	\$ -	\$ 322,894	\$ -
769S Stettler Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
766S Nevis - Elnora 2 GHz MHSB					
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 310,540	\$ -	\$ 310,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 1,485,654	\$ -	\$ 1,485,654	\$ -



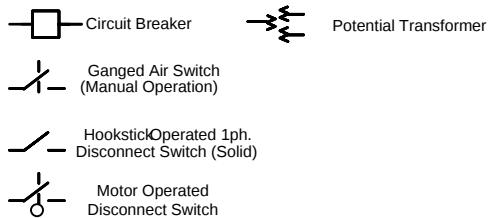
Pemukan 932S

**Hanna Area Transmission
Development
Proposed Initial Configuration**

812-SLD-932S

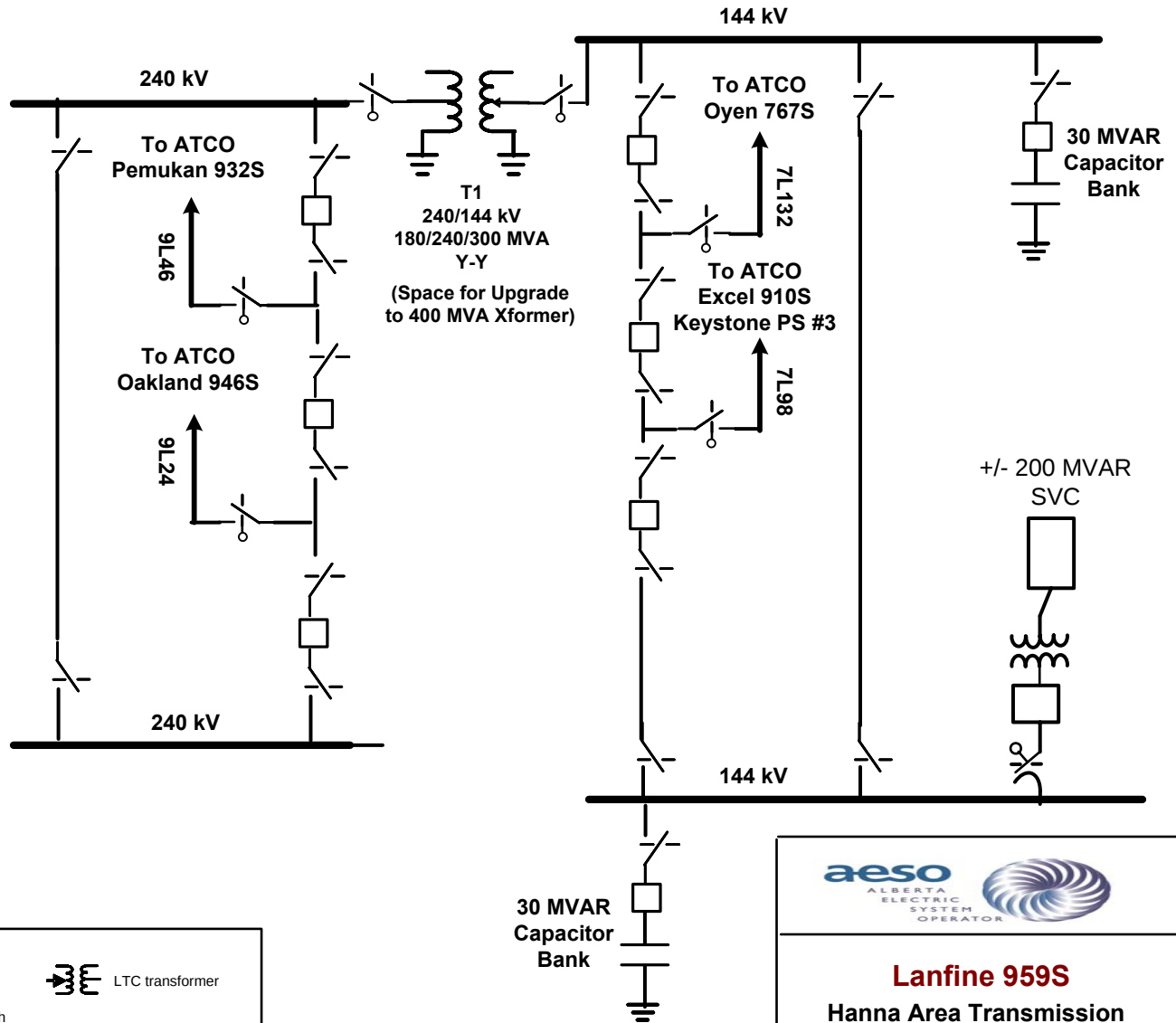


Legend



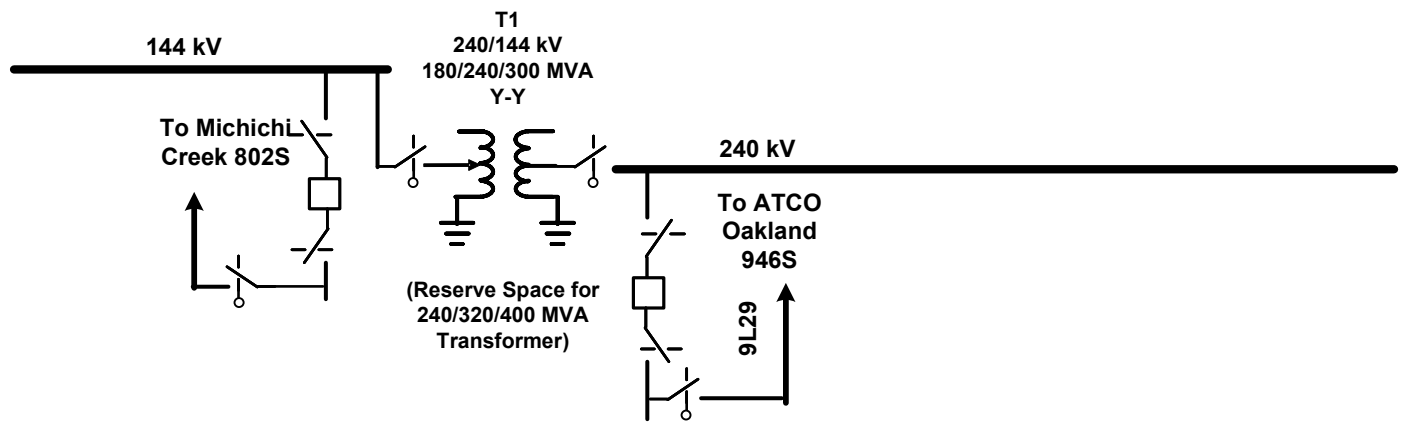
Oakland 946S
**Hanna Area Transmission
 Development
 Proposed Initial Configuration**

812-SLD-946S



Lanfine 959S
Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-959S



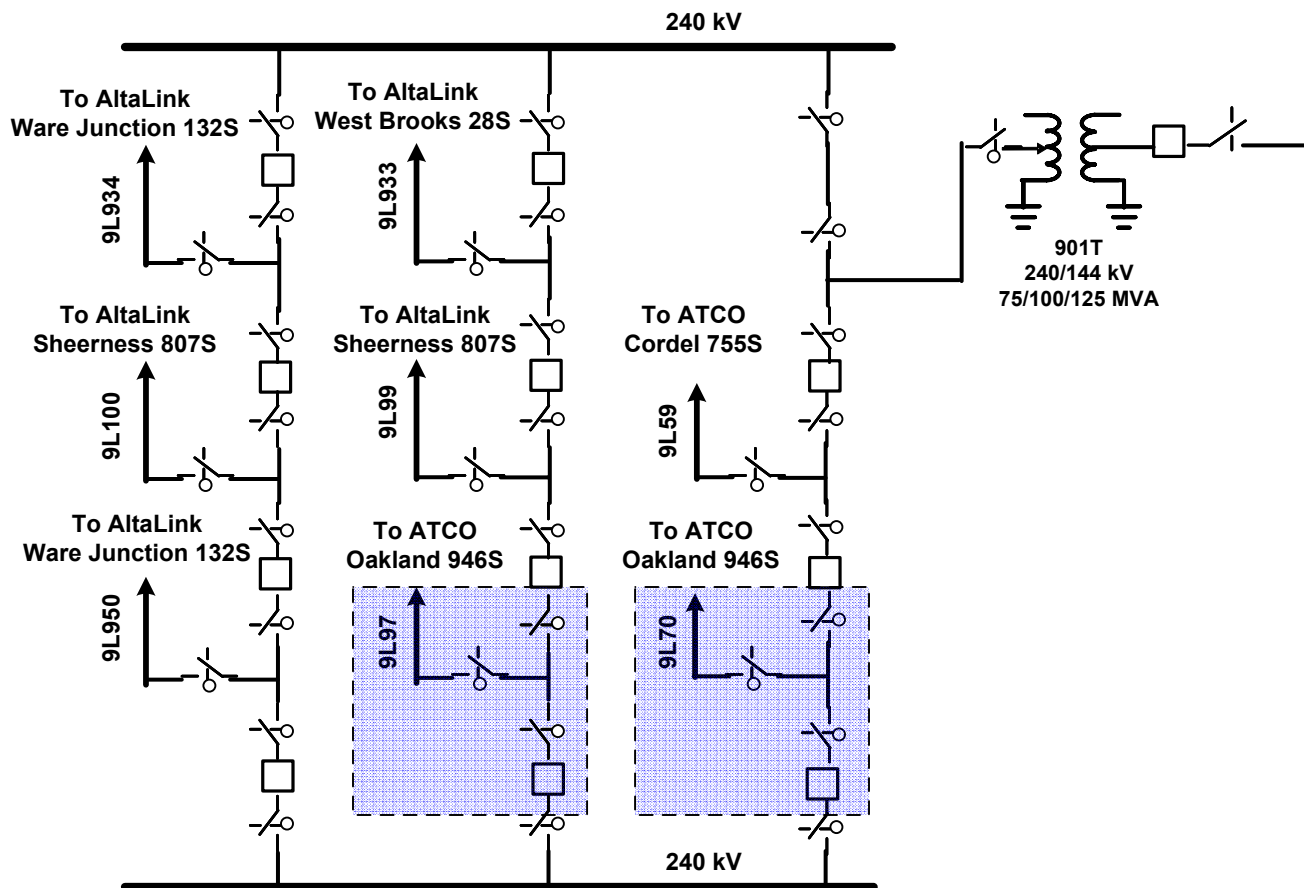
Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		
	Hookstick Operated 1ph. Disconnect Switch (Solid)		
	Ganged Air Switch (Motorized Operation)		



Coyote Lake 963S
**Hanna Area Transmission
 Development
 Proposed Initial Configuration**

812-SLD-963S



Legend

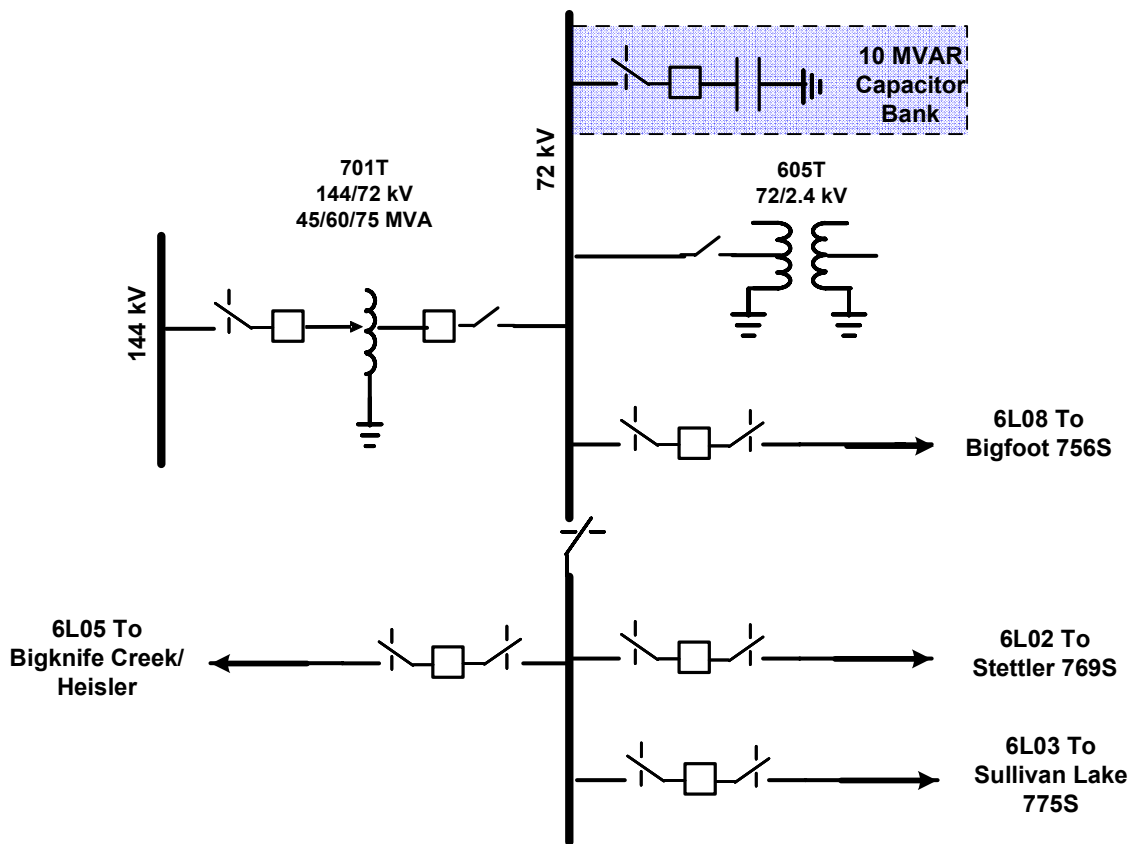
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Future Development
	Hookstick Operated 1ph. Disconnect Switch (Solid)		Proposed Additions
	Motor Operated Disconnect Switch		



Anderson 801S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-801S



Legend

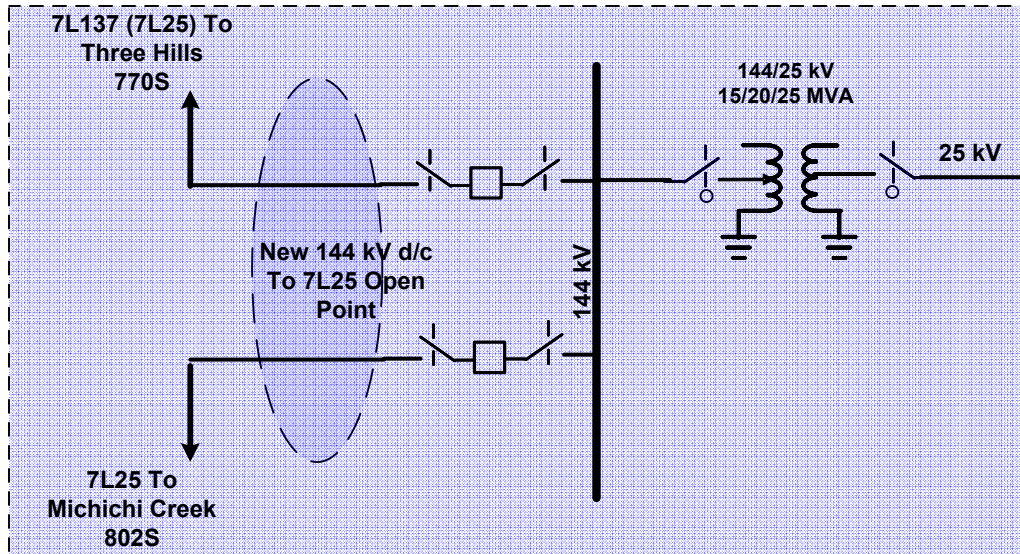
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Motor Operated Disconnect Switch		
	Hookstick Operated 1ph. Disconnect Switch (Solid)		



Battle River 757S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-757S



Legend

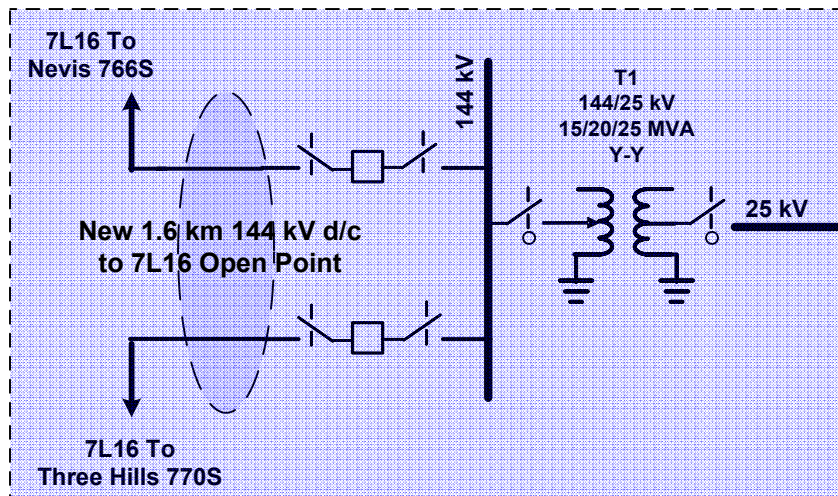
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Relocated Equipment
	Motor Operated Disconnect Switch		Salvaged Equipment
			Proposed Additions



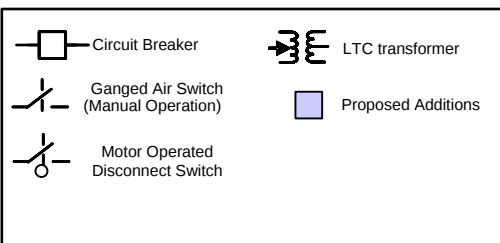
Cornish Lake 954S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-954S



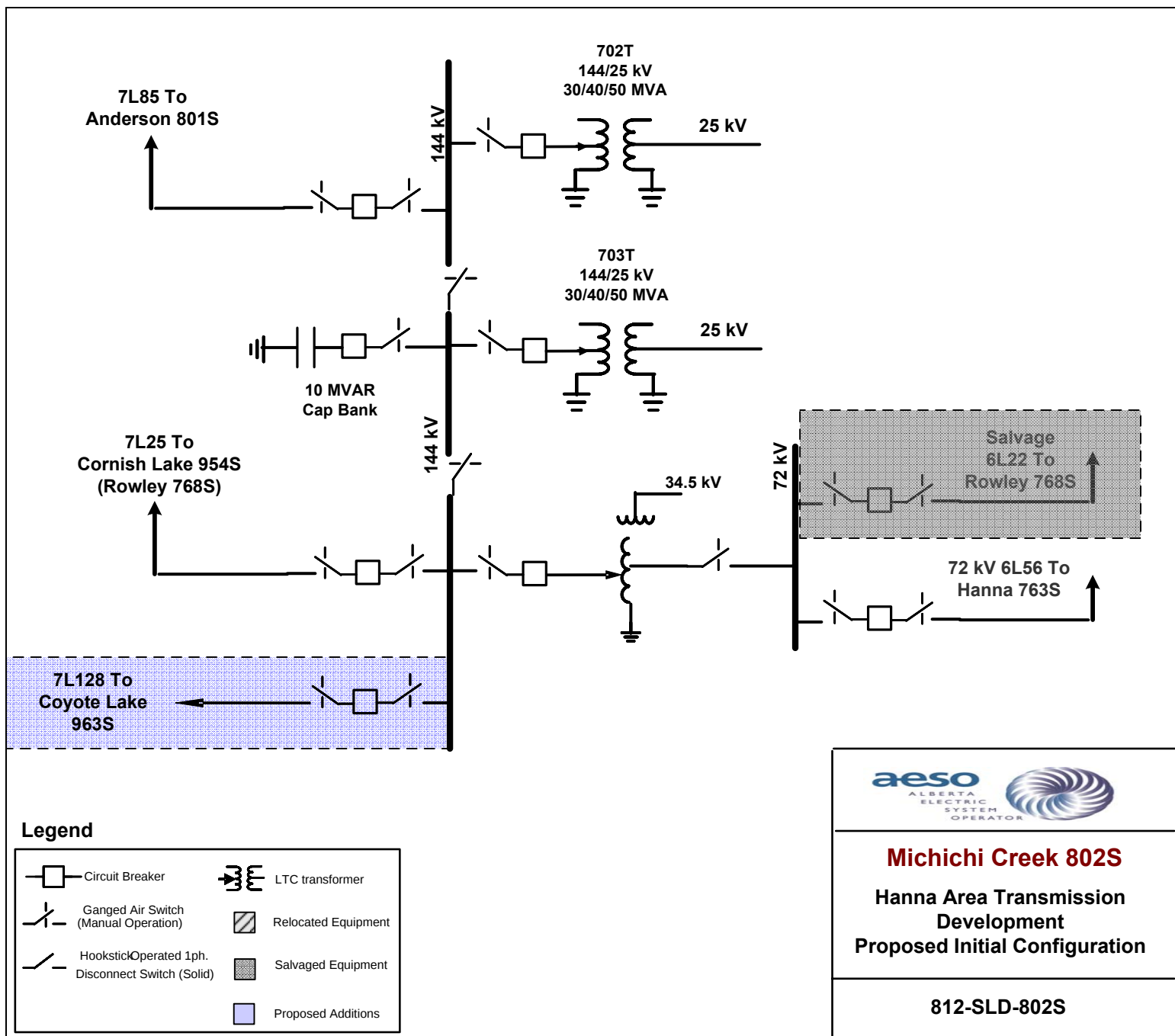
Legend



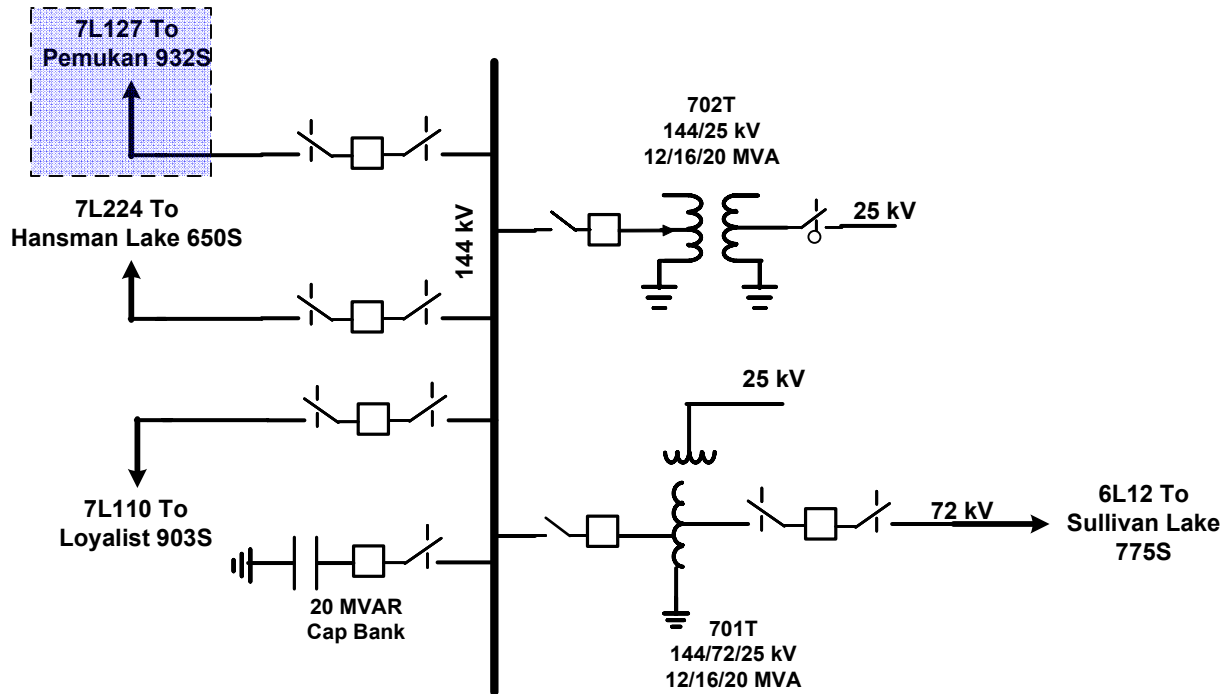
Heatburg 948S

**Hanna Area Transmission
Development
Proposed Initial Configuration**

812-SLD-948S



**Note: 7L79 to Veteran 771S and
7L98 to Oyen 767S
Disconnected to Provide
144 kV Bay for New 7L127 & 7L110 Lines**



Legend

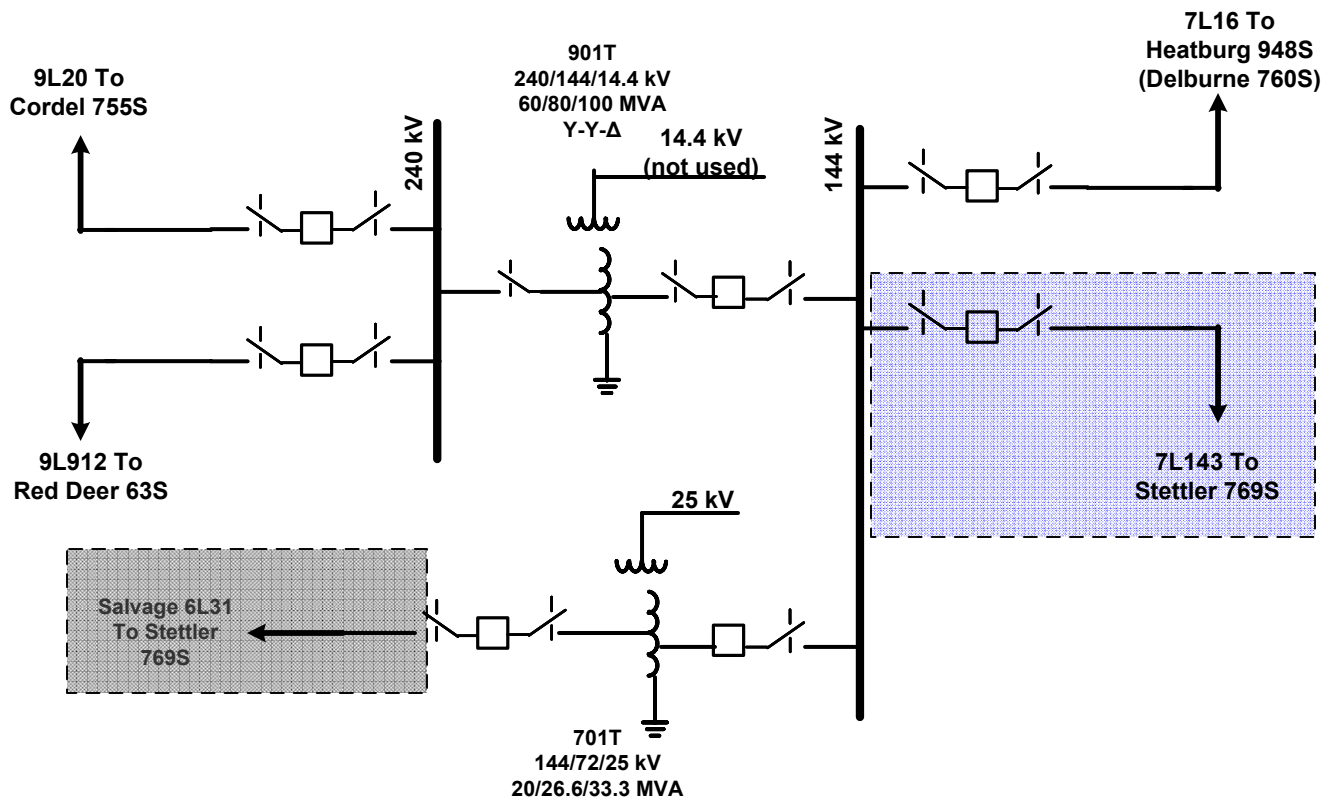
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		
	Motor Operated Disconnect Switch		



Monitor 774S

**Hanna Area Transmission
Development
Proposed Initial Configuration**

812-SLD-774S



Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		Relocated Equipment
			Salvaged Equipment

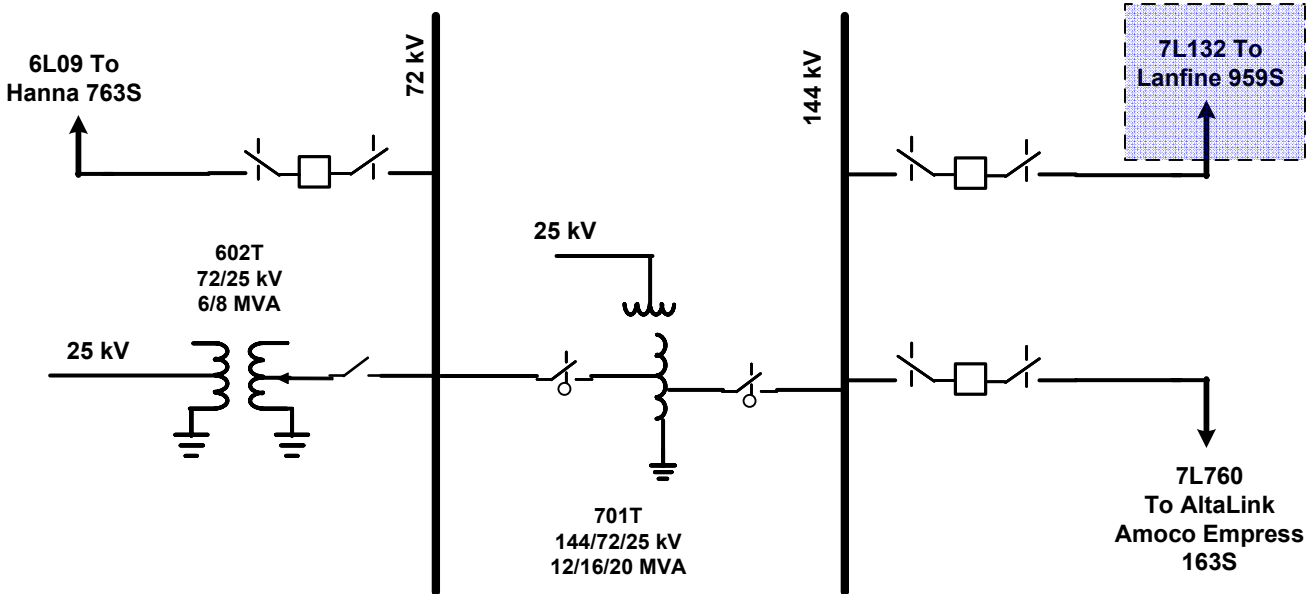


Nevis 766S

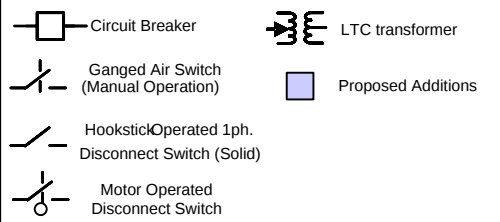
**Hanna Area Transmission
Development
Proposed Initial Configuration**

812-SLD-766S

**Note: 7L98 to Monitor 774S
Disconnected to Provide
144 kV Bay for New 7L132 Line**



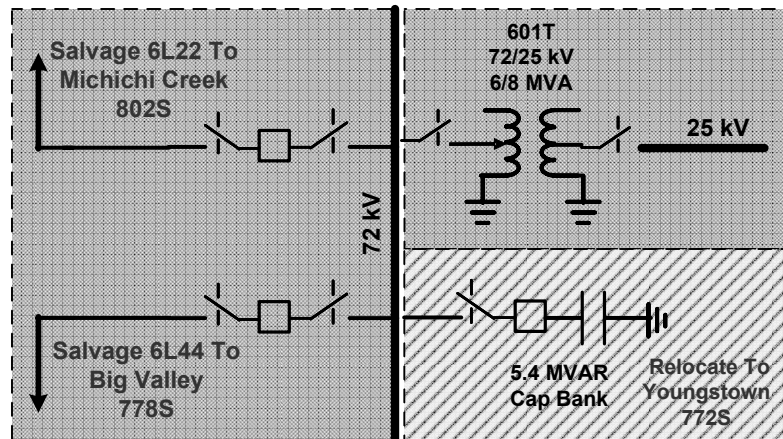
Legend



Oyen 767S

Hanna Area Transmission Development Proposed Initial Configuration

812-SLD-767S



Legend

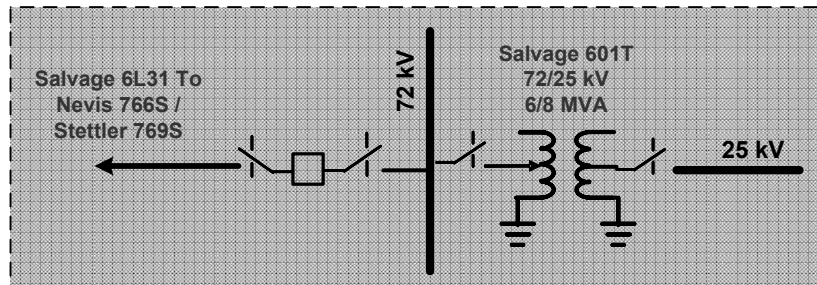
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Relocated Equipment
	Motor Operated Disconnect Switch		Salvaged Equipment
			Proposed Additions



Rowley 768S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-768S



Legend

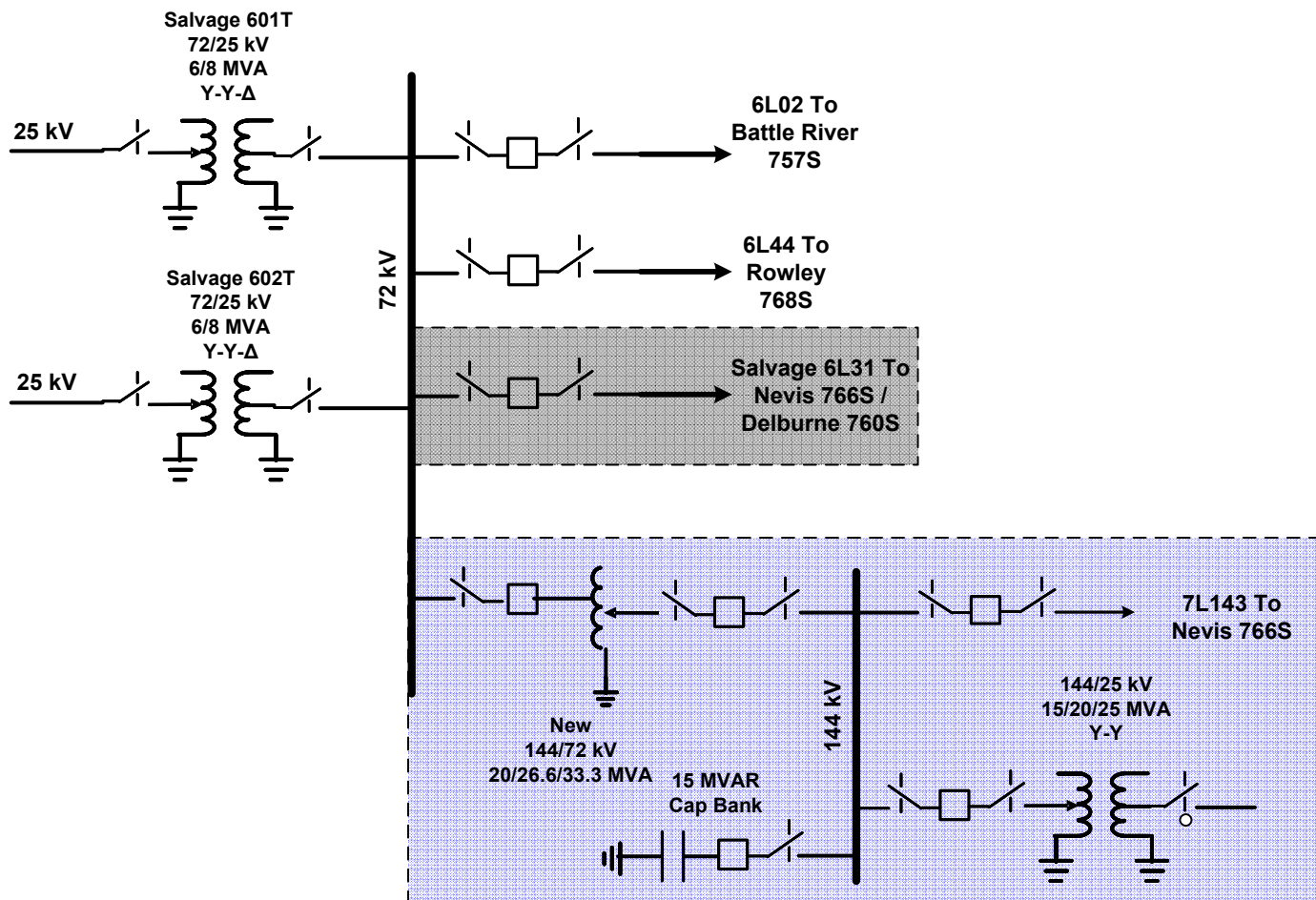
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Salvaged Equipment
	Motor Operated Disconnect Switch		



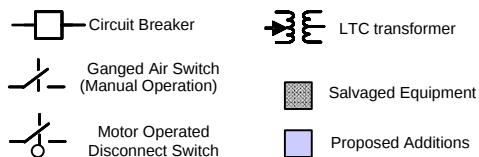
Delburne 760S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-760S



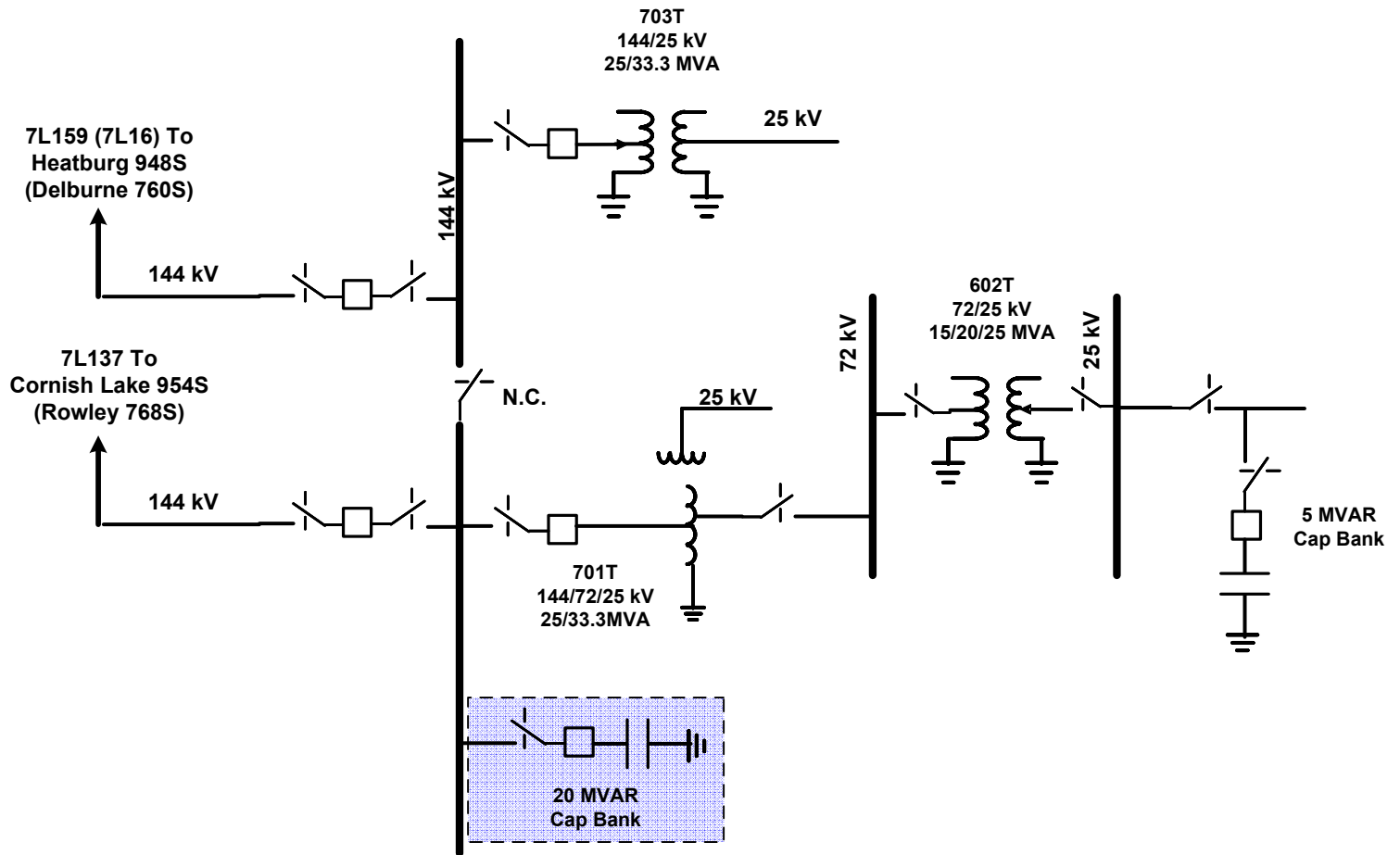
Legend



Stettler 769S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-769S



Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		

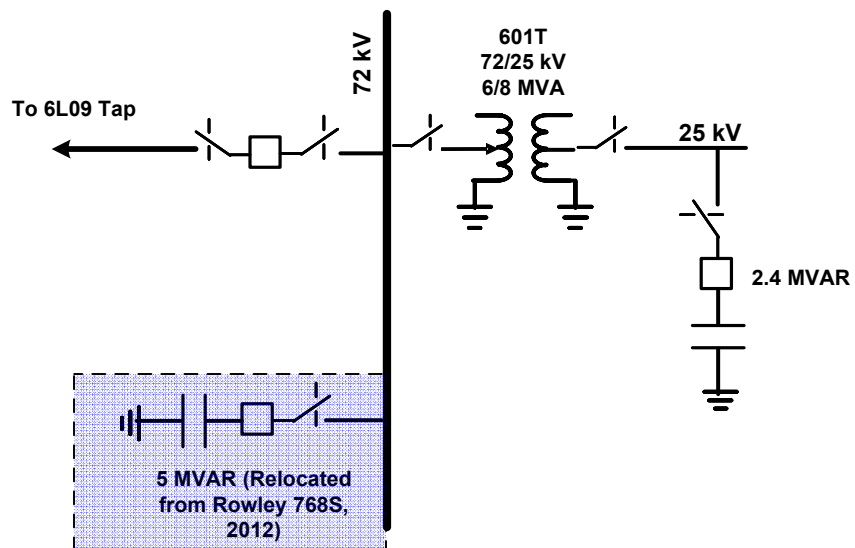


Three Hills 770S

Hanna Area Transmission Development

Proposed Initial Configuration

812-SLD-770S



Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		



Youngstown 772S

Hanna Area Transmission
Development
Proposed Initial Configuration

812-SLD-772S

ALTA LINK

Project:	Hanna Area Transmission Development - Development # 1 & 3 - Option 2 (2009\$)
TFO:	AltaLink
Prepared by:	
Date:	
Accuracy:	+30%/-15%

	System Portion	Customer Portion	TOTAL
Transmission Lines	\$ 27,747,000	\$ -	\$ 27,747,000
Substation Facilities	\$ 21,637,000	\$ -	\$ 21,637,000
Telecommunication	\$ 753,000	\$ -	\$ 753,000
Total Facility Costs	\$ 50,137,000	\$ -	\$ 50,137,000
Owners Costs	\$ 1,237,000	\$ -	\$ 1,237,000
Distributed Costs	\$ 7,398,000	\$ -	\$ 7,398,000
Total Owners and Dist. Costs	\$ 8,635,000	\$ -	\$ 8,635,000
Total Direct Costs	\$ 58,772,000	\$ -	\$ 58,772,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ 4,702,000	\$ -	\$ 4,702,000
AFUDC	\$ 5,903,000	\$ -	\$ 5,903,000
Total Indirect Costs	\$ 10,605,000	\$ -	\$ 10,605,000
TOTAL PROJECT COSTS	\$ 69,377,000	\$ -	\$ 69,377,000

Capital Maintenance	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-

Assumptions and Risks

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
681L	138kV Line From existing 681L to Tucuman 478S				
	0.3 km of line using 477MCM ACSR Hawk that is S/C w/o underbuild	\$ 208,567	\$ -	\$ 208,567	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 208,567	\$ -	\$ 208,567	\$ -
New Line	138kV Line From Nilrem 574S to Tucuman 478S				
	3 km of line using 1 x 477 ACSR Hawk(single conductor per phase) that is D/C w/o underbuild	\$ 2,263,720	\$ -	\$ 2,263,720	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 2,263,720	\$ -	\$ 2,263,720	\$ -
New Line	240kV Line From Nilrem574S to 953L Struc.#188				
	30 km of line using 2 x 477 ACSR Hawk (double conductor per phase) that is D/C w/o underbuild	\$ 25,274,519	\$ -	\$ 25,274,519	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 25,274,519	\$ -	\$ 25,274,519	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 27,746,805	\$ -	\$ 27,746,805	\$ -

Substation - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
478S	Tucuman 478S				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <dead tank, 138 kV>	\$ 591,050	\$ -	\$ 591,050	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ 104,852	\$ -	\$ 104,852	\$ -
	Switch Yard and Substation Control Building	\$ 943,313	\$ -	\$ 943,313	\$ -
	Protection, control, metering	\$ 317,678	\$ -	\$ 317,678	\$ -
	SCADA	\$ 23,562	\$ -	\$ 23,562	\$ -
	Misc	\$ 15,735	\$ -	\$ 15,735	\$ -
	Sub - Total	\$ 1,996,189	\$ -	\$ 1,996,189	\$ -
574S	Niirem 574S				
	Transformer <2, 240/320/400 MVA , 240/138 kV>	\$ 8,783,945	\$ -	\$ 8,783,945	\$ -
	Circuit Breakers <live tank, 240 kV>	\$ 1,126,003	\$ -	\$ 1,126,003	\$ -
	Circuit Breakers <dead tank, 138 kV>	\$ 612,786	\$ -	\$ 612,786	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ 726,739	\$ -	\$ 726,739	\$ -
	Switch Yard and Substation Control Building	\$ 7,137,131	\$ -	\$ 7,137,131	\$ -
	Protection, control, metering	\$ 1,101,013	\$ -	\$ 1,101,013	\$ -
	SCADA	\$ 138,733	\$ -	\$ 138,733	\$ -
	<Misc.>	\$ 14,663	\$ -	\$ 14,663	\$ -
	Sub - Total	\$ 19,641,013	\$ -	\$ 19,641,013	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 21,637,202	\$ -	\$ 21,637,202	\$ -

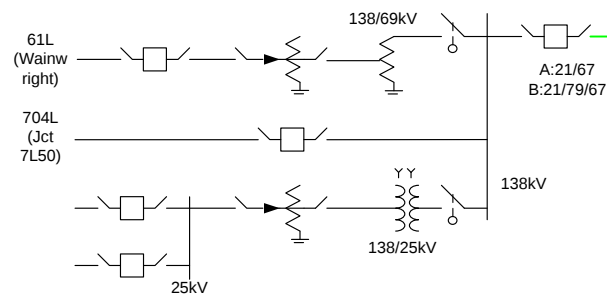
Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
478T	Tucuman				
	Tower/Antenna	\$ 37,008	\$ -	\$ 37,008	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 121,477	\$ -	\$ 121,477	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 158,485	\$ -	\$ 158,485	\$ -
574T	Nilrem				
	Tower/Antenna	\$ 261,316	\$ -	\$ 261,316	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 333,055	\$ -	\$ 333,055	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 594,370	\$ -	\$ 594,370	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ 752,856	\$ -	\$ 752,856	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 27,746,805	\$ -	\$ 27,746,805	\$ -
Substation Project Costs	\$ 21,637,202	\$ -	\$ 21,637,202	\$ -
Telecommunications Project Costs	\$ 752,856	\$ -	\$ 752,856	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 50,136,863	\$ -	\$ 50,136,863	\$ -
Owners Cost				
Preliminary Engineering	\$ 25,000	\$ -	\$ 25,000	\$ -
Siting	\$ 300,000	\$ -	\$ 300,000	\$ -
Protection Settings	\$ 210,000	\$ -	\$ 210,000	\$ -
Land	\$ 702,271	\$ -	\$ 702,271	\$ -
Sub - Total	\$ 1,237,271	\$ -	\$ 1,237,271	\$ -
Distributed Cost				
Distributed Cost	\$ 2,054,965	\$ -	\$ 2,054,965	\$ -
Contingency	\$ 5,342,910	\$ -	\$ 5,342,910	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 7,397,875	\$ -	\$ 7,397,875	\$ -
Indirect Costs				
E&S	\$ 4,701,761	\$ -	\$ 4,701,761	\$ -
AFUDC	\$ 5,903,061	\$ -	\$ 5,903,061	\$ -
Sub - Total	\$ 10,604,821	\$ -	\$ 10,604,821	\$ -
Total Project Cost	\$ 69,376,830	\$ -	\$ 69,376,830	\$ -

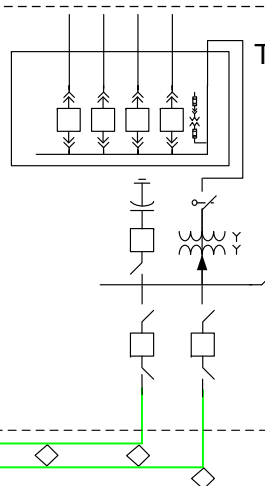
Jarrow 252S



704AL

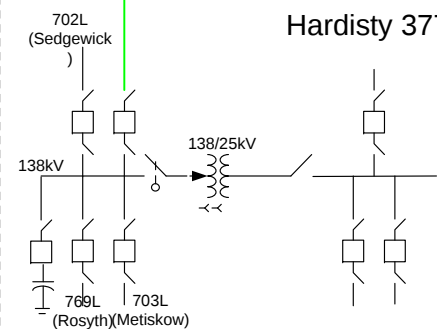
704L

Tucuman 478S

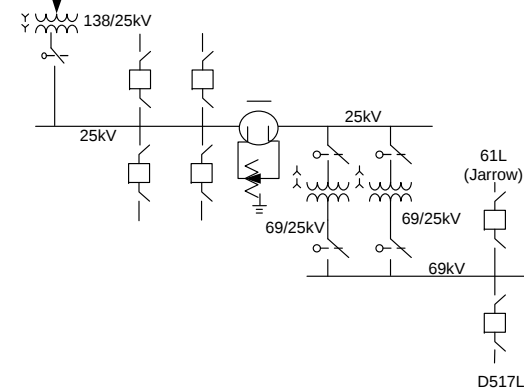


681L

Hardisty 377S



Wainwright 51S



Legend

—	69kV
—	138kV
—	240kV
	Equipment to be Added

ALTALINK

Single Line Diagram

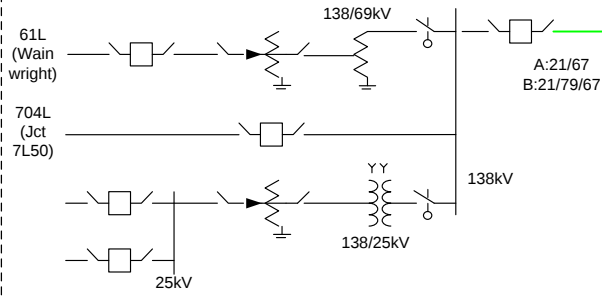
**Hanna Area Transmission Development
Development # 1 & 3 – Existing System**

Date:
2009-03-30

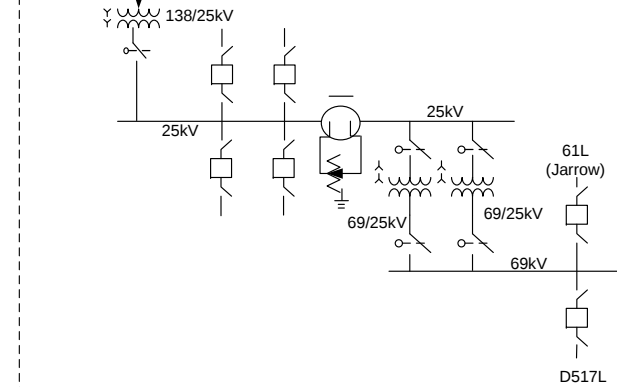
By:
RL

SLD No.:
09-264

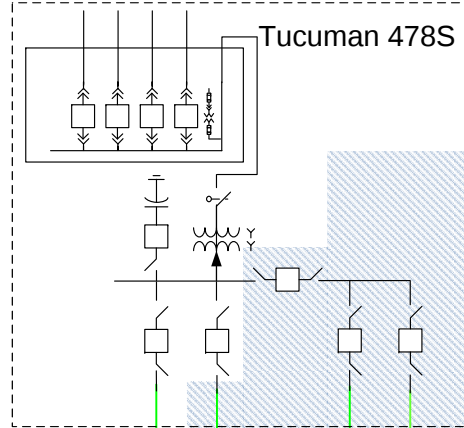
Jarrow 252S



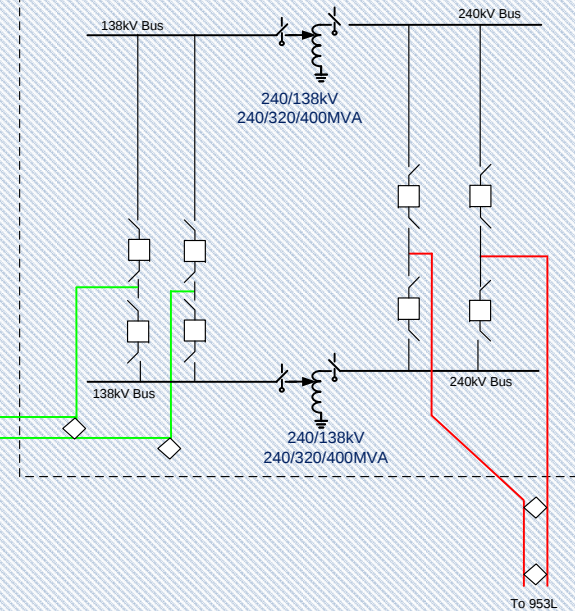
Wainwright 51S



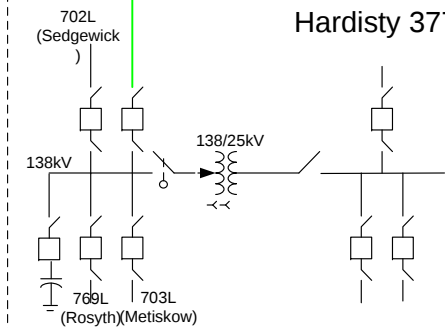
Tucuman 478S



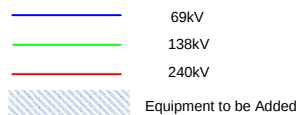
Nilrem 574S



Hardisty 377S



Legend



ALTALINK

Single Line Diagram

**Hanna Area Transmission Development
Development # 1 & 3 – Option # 2**

Date:
2009-03-30

By:
RL

SLD No.:
09-266

ALTA LINK

TFO: **AltaLink**

Date: July 31, 2009

Accuracy: +30%/-30%

Owners Costs	\$ 392,000	\$ -	\$ 392,000
Distributed Costs	<u>\$ 3,679,139</u>	<u>\$ -</u>	<u>\$ 3,679,139</u>
Total Owners and Dist. Costs	\$ 4,071,139	\$ -	\$ 4,071,139

Costs are shown in \$2009 (ISD is 2012)
Please refer to list of Assumptions and Risks

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	Hansmen Lake 650S to ATCO territory				
	20 km of line using 240 kV 2 X 795 kcmil that is D/C with one side strung	\$ 12,375,355	\$ -	\$ 12,375,355	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 12,375,355	\$ -	\$ 12,375,355	\$ -
Line 2	Line 2 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 3	Line 3 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 12,375,355	\$ -	\$ 12,375,355	\$ -

Substation - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	240 kV Circuit Breakers < qty: 3, live tank>	\$ 911,232	\$ -	\$ 911,232	\$ -
	240 kV Disconnects <qty: 6 Manual and 2 Motor opes>	\$ 499,841	\$ -	\$ 499,841	\$ -
	240 kV PT's, CT's and SA's <qty: 2 PTs; 3 CTs and 2 SAs>	\$ -	\$ -	\$ -	\$ -
	240 kV Protection, control, metering	\$ 159,665	\$ -	\$ 159,665	\$ -
	SCADA	\$ 598,014	\$ -	\$ 598,014	\$ -
	Switch Yard	\$ 630,807	\$ -	\$ 630,807	\$ -
	Site Developments	\$ 257,928	\$ -	\$ 257,928	\$ -
	Station Energization	\$ 27,500	\$ -	\$ 27,500	\$ -
	#REF!	\$ 56,298	\$ -	\$ 56,298	\$ -
	Sub - Total	\$ 3,141,285	\$ -	\$ 3,141,285	\$ -
Sub 2	Sub 2 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 3,141,285	\$ -	\$ 3,141,285	\$ -

Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Telecom 1 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 2	Telecom 2 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 12,375,355	\$ -	\$ 12,375,355	\$ -
Substation Project Costs	\$ 3,141,285	\$ -	\$ 3,141,285	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 15,516,640	\$ -	\$ 15,516,640	\$ -
Owners Cost				
Preliminary Engineering	\$ 25,000	\$ -	\$ 25,000	\$ -
Siting	\$ 150,000	\$ -	\$ 150,000	\$ -
Protection Settings	\$ 35,000	\$ -	\$ 35,000	\$ -
Land	\$ 182,000	\$ -	\$ 182,000	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 392,000	\$ -	\$ 392,000	\$ -
Distributed Cost				
Distributed Cost	\$ 1,898,432	\$ -	\$ 1,898,432	\$ -
Contingency	\$ 1,780,707	\$ -	\$ 1,780,707	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 3,679,139	\$ -	\$ 3,679,139	\$ -
Indirect Costs				
E&S	\$ 1,567,022	\$ -	\$ 1,567,022	\$ -
AFUDC	\$ 1,967,397	\$ -	\$ 1,967,397	\$ -
Sub - Total	\$ 3,534,419	\$ -	\$ 3,534,419	\$ -
Total Project Cost	\$ 23,122,198	\$ -	\$ 23,122,198	\$ -

ALTA LINK

Project:	Hanna Area Transmission Development - Development 5 Amendment (\$2009)
TFO:	AltaLink
Prepared by:	Teshmont
Date:	July 22, 2009
Accuracy:	+30%/-30%

Capital Maintenance	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-

Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

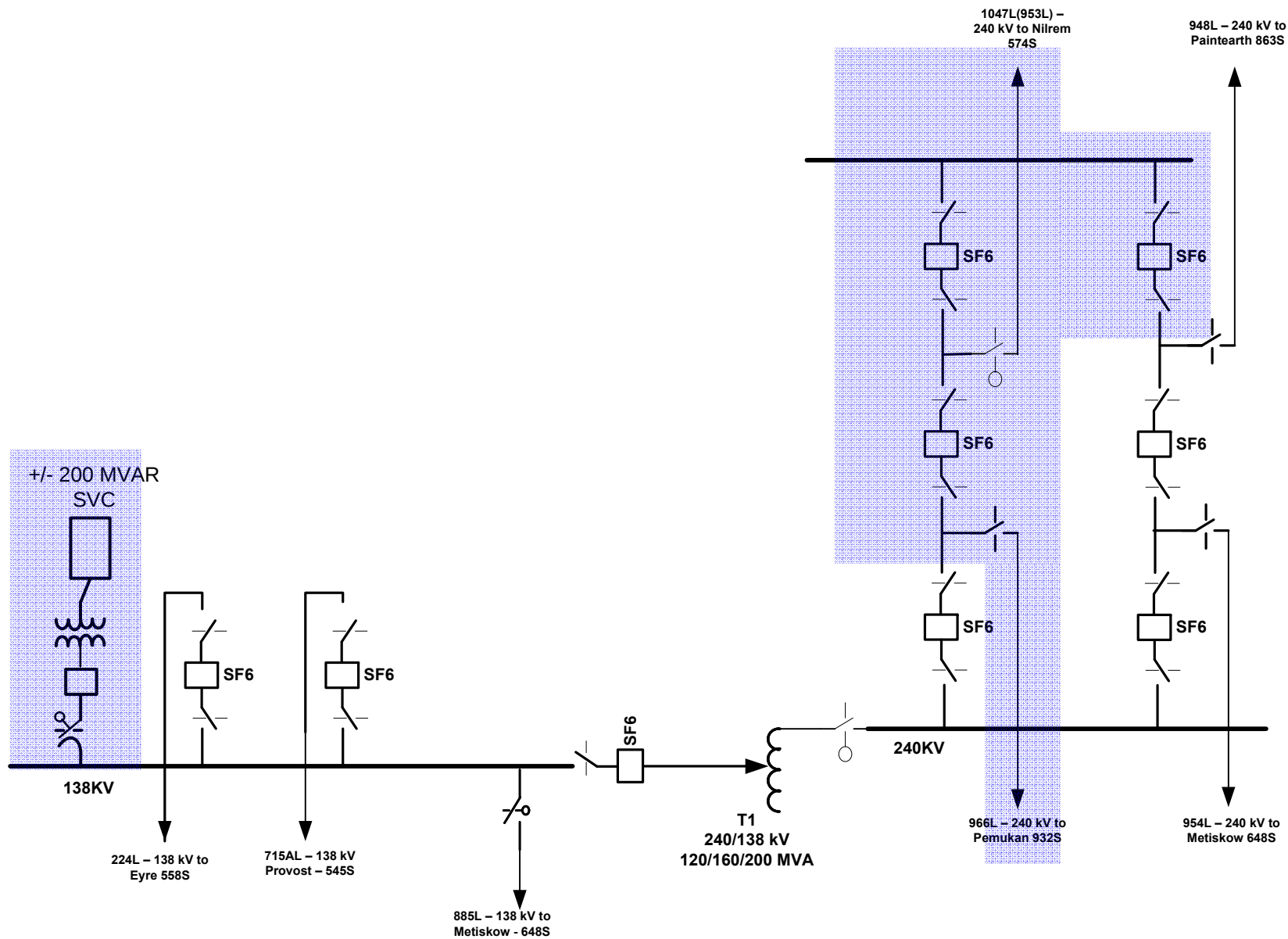
		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	138 kV Circuit Breakers < qty: 1, dead tank>	\$ -	\$ 199,740	\$ 199,740	\$ -
	138 kV Disconnects <qty: 3 Manual and 1 Motor operated>	\$ -	\$ 264,742	\$ 264,742	\$ -
	138 kV PT's, CT's and SA's <qty: 1 PT and 1 SA>	\$ -	\$ 133,617	\$ 133,617	\$ -
	138 kV Protection, control, metering	\$ -	\$ 92,200	\$ 92,200	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Static Var Compensator (+/-200 Mvar at 138 kV)	\$ -	\$ 25,000,000	\$ 25,000,000	\$ -
	Switch Yard	\$ -	\$ 616,470	\$ 616,470	\$ -
	Site Developments	\$ -	\$ 446,980	\$ 446,980	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
Sub - Total		\$ -	\$ 26,829,929	\$ 26,829,929	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 26,829,929	\$ 26,829,929	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 26,829,929	\$ 26,829,929	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 26,829,929	\$ 26,829,929	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 20,000	\$ 20,000	\$ -
Protection Settings	\$ -	\$ 20,000	\$ 20,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 65,000	\$ 65,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 4,703,204	\$ 4,703,204	\$ -
Contingency	\$ -	\$ 3,159,813	\$ 3,159,813	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 7,863,017	\$ 7,863,017	\$ -
Indirect Costs				
E&S	\$ -	\$ 2,780,636	\$ 2,780,636	\$ -
AFUDC	\$ -	\$ 2,627,701	\$ 2,627,701	\$ -
Sub - Total	\$ -	\$ 5,408,336	\$ 5,408,336	\$ -
Total Project Cost	\$ -	\$ 40,166,282	\$ 40,166,282	\$ -



LEGEND:

	Substation Fence		Transformer		Fuse		Proposed Additions
	Motorized Air Break		Circuit Breaker		Generation		Disconnect Switch
	AutoTransformer		Capacitor Bank		Motorized air break with arcing horn		Ganged Air Switch

HANSMAN LAKE 650S Hanna Area Transmission Development Proposed Initial Configuration

812-SLD-650S

Estimate Summary for Need Identification Document (NID)



Project: Hanna Area Transmission Development
 - Development 9 (2009\$)
TFO: AltaLink
Prepared by: Teshmont
Date: April 29, 2009
Accuracy: +30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 1,859,000	\$ 1,859,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 1,859,000	\$ 1,859,000
Owners Costs	\$ -	\$ 65,000	\$ 65,000
Distributed Costs	\$ -	\$ 577,000	\$ 577,000
Total Owners and Dist. Costs	\$ -	\$ 642,000	\$ 642,000
Total Direct Costs	\$ -	\$ 2,501,000	\$ 2,501,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 200,000	\$ 200,000
AFUDC	\$ -	\$ 189,000	\$ 189,000
Total Indirect Costs	\$ -	\$ 389,000	\$ 389,000
TOTAL PROJECT COSTS	\$ -	\$ 2,890,000	\$ 2,890,000

Capital Maintenance
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

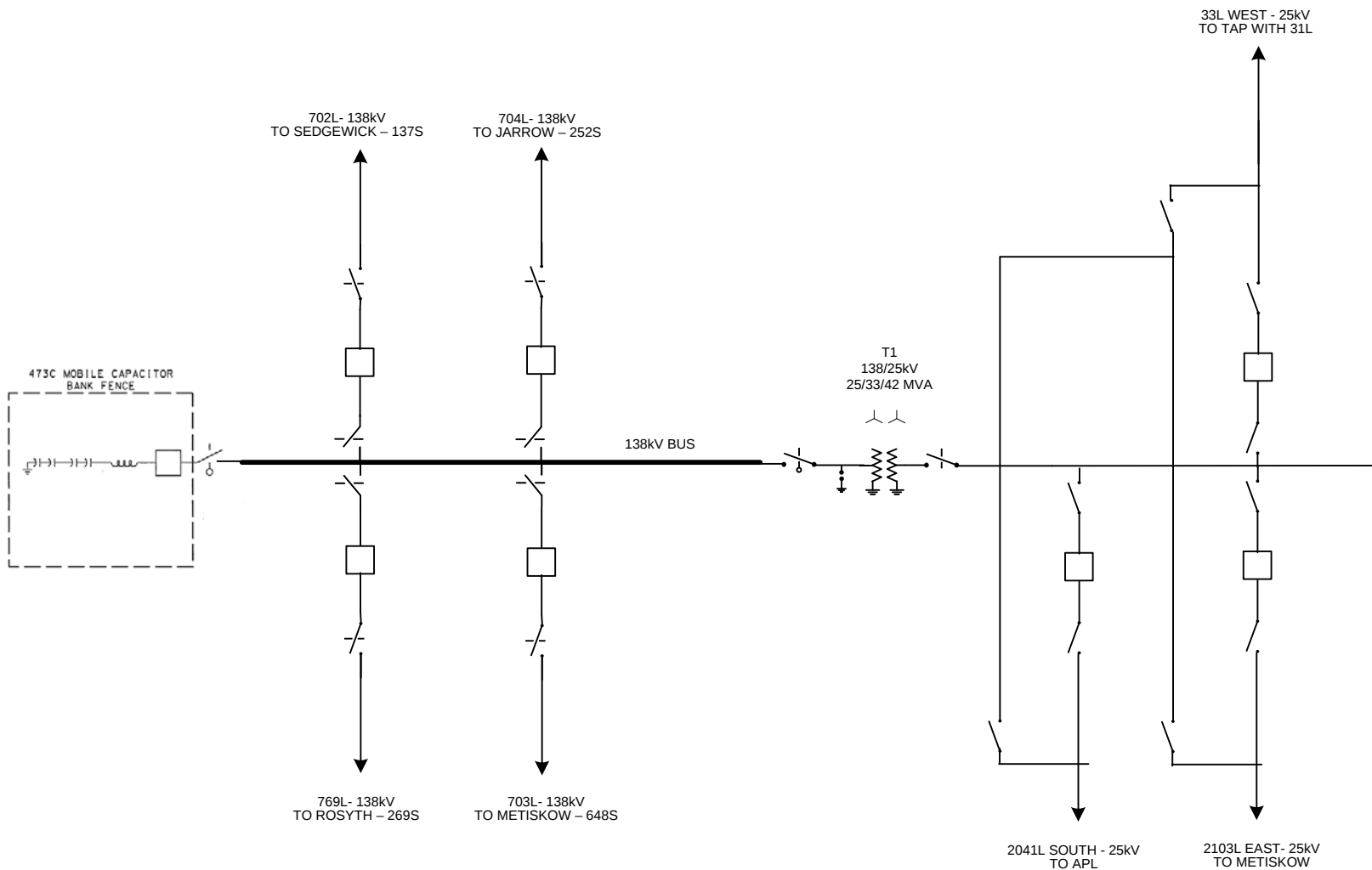
		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Hardisty 377S				
	138 kV Circuit Breakers < qty: 1 dead tank>	\$ -	\$ 264,181	\$ 264,181	\$ -
	138 kV Disconnects <qty: 1 Manual operated>	\$ -	\$ 92,389	\$ 92,389	\$ -
	138 kV Capacitor Bank <qty: 1, 27 MVAR>	\$ -	\$ 437,725	\$ 437,725	\$ -
	Protection, control, metering	\$ -	\$ 411,640	\$ 411,640	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Switch Yard	\$ -	\$ 502,538	\$ 502,538	\$ -
	Site Developments	\$ -	\$ 74,040	\$ 74,040	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
	Sub - Total	\$ -	\$ 1,858,693	\$ 1,858,693	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 1,858,693	\$ 1,858,693	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 1,858,693	\$ 1,858,693	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,858,693	\$ 1,858,693	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 15,000	\$ 15,000	\$ -
Protection Settings	\$ -	\$ 25,000	\$ 25,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 65,000	\$ 65,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 349,896	\$ 349,896	\$ -
Contingency	\$ -	\$ 227,359	\$ 227,359	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 577,255	\$ 577,255	\$ -
Indirect Costs				
E&S	\$ -	\$ 200,076	\$ 200,076	\$ -
AFUDC	\$ -	\$ 189,072	\$ 189,072	\$ -
Sub - Total	\$ -	\$ 389,148	\$ 389,148	\$ -
Total Project Cost	\$ -	\$ 2,890,096	\$ 2,890,096	\$ -



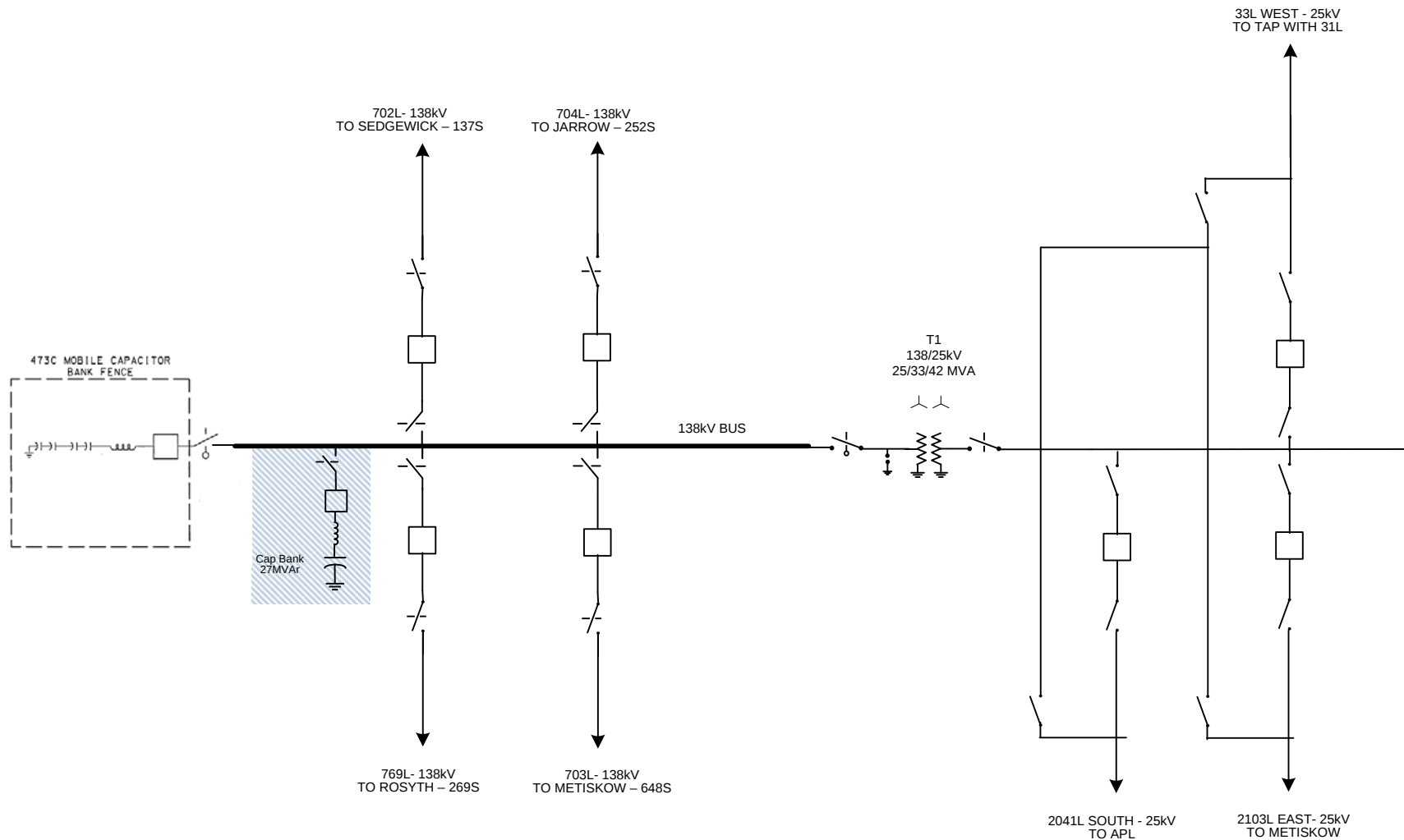
Legend

	Circuit Breaker		LTC Transformer
	Ganged Air-Switch (Motor Operated)		Shunt Power Capacitor
	Ganged Air-Switch (Manual Operated)		Power Reactor
	Existing		Equipment Added in Separate Development
	2012 Development		2017 Development

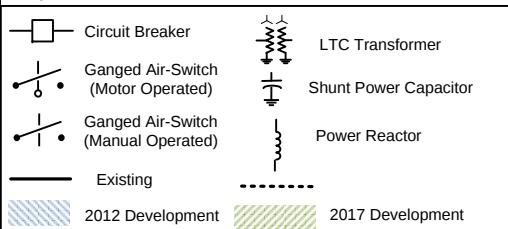
ALTALINK

Hanna Area Transmission Development
Development 9 – Hardisty 377S
Existing Substation

Date:	By:	SLD No.
2009-04-07		09-303



Legend



ALTALINK

Hanna Area Transmission Development
Development 9 – Hardisty 377S
Proposed Development

Date:	By:	SLD No.
2009-04-07		09-305

ALTA LINK

Project:	Amended Development #11/#12, SLD 09-538 (2009\$) 2 X 1033 240 kV Line and Substation Upgrades
TFO:	AltaLink
Prepared by:	Arnie Reimer
Date:	July 17, 2009
Accuracy:	+30%/-15%

	System Portion	Customer Portion	TOTAL
Transmission Lines	\$ 35,585,000	\$ -	\$ 35,585,000
Substation Facilities	\$ 13,237,000	\$ -	\$ 13,237,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ 48,822,000	\$ -	\$ 48,822,000
Owners Costs	\$ 2,468,115	\$ -	\$ 2,468,115
Distributed Costs	\$ 7,386,000	\$ -	\$ 7,386,000
Total Owners and Dist. Costs	\$ 9,854,115	\$ -	\$ 9,854,115
Total Direct Costs	\$ 58,676,115	\$ -	\$ 58,676,115
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ 4,694,000	\$ -	\$ 4,694,000
AFUDC	\$ 5,893,000	\$ -	\$ 5,893,000
Total Indirect Costs	\$ 10,587,000	\$ -	\$ 10,587,000
TOTAL PROJECT COSTS	\$ 69,263,115	\$ -	\$ 69,263,115

Capital Maintenance	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-

Assumptions and Risks

In-Service Date of 2013
SATR Development is Complete before this Development
D/C Construction, first side strung

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	Ware Junction to New West Brooks				
	"28.8" km of line using 2x1033 that is D/C first side strung only with OPGW	\$ 35,584,900	\$ -	\$ 35,584,900	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 35,584,900	\$ -	\$ 35,584,900	\$ -
Line 2	Line 2 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 3	Line 3 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 35,584,900	\$ -	\$ 35,584,900	\$ -

Substation - NID Estimate

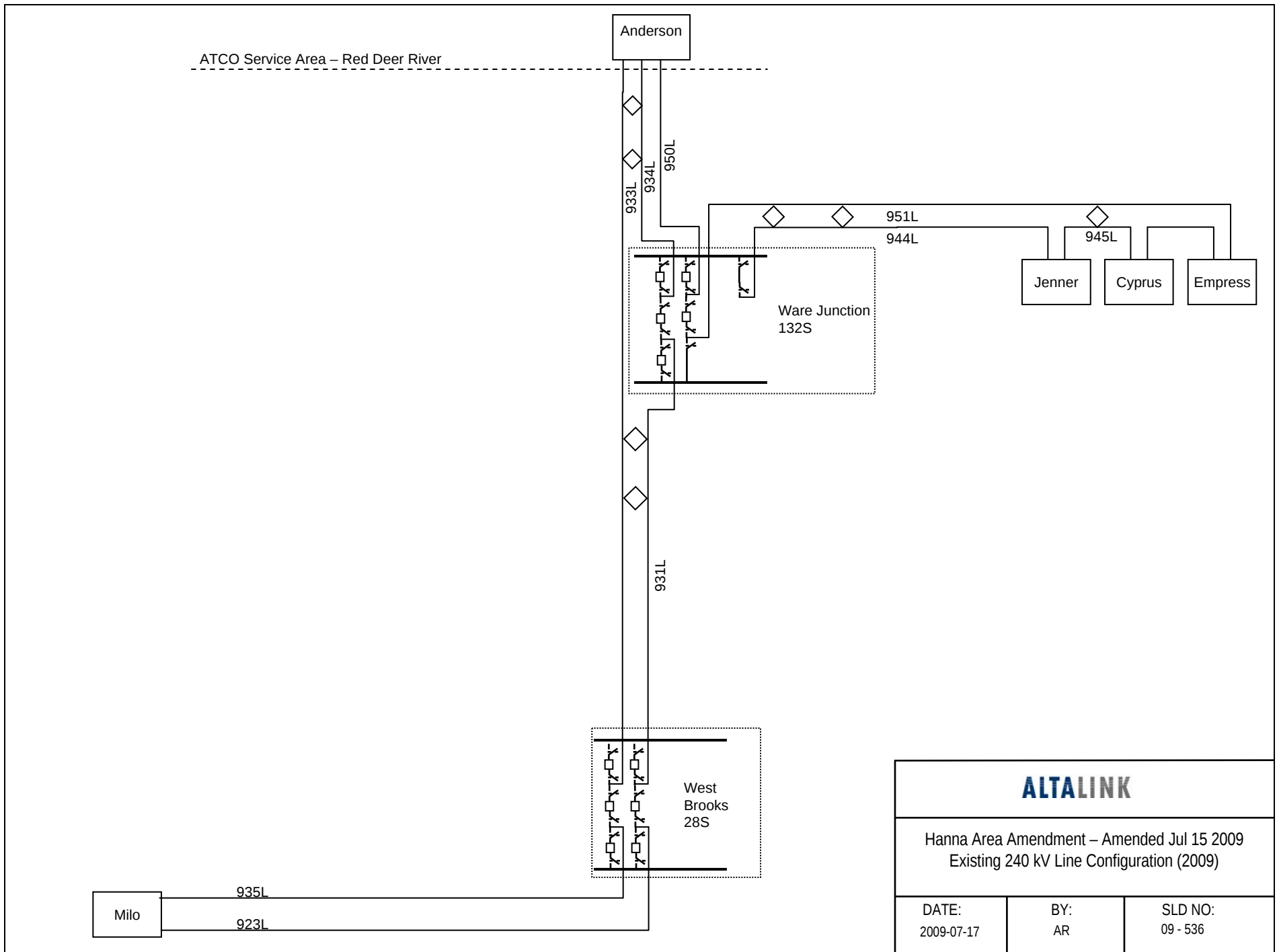
		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Ware Junction Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers Post SATR Development	\$ 10,915,832	\$ -	\$ 10,915,832	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 10,915,832	\$ -	\$ 10,915,832	\$ -
Sub 2	New West Brooks Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <2 X 240 kV>	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 13,236,828	\$ -	\$ 13,236,828	\$ -

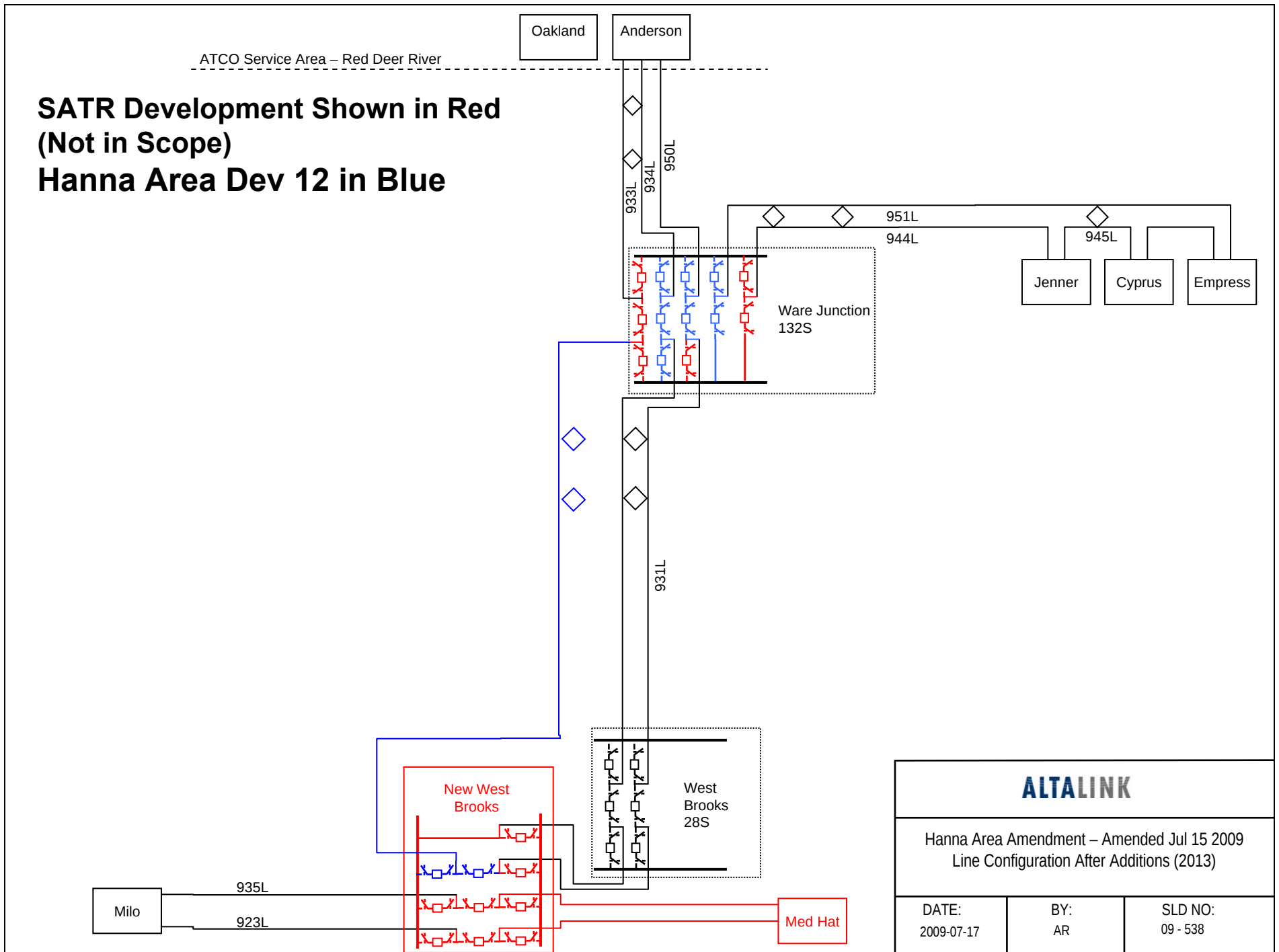
Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Telecom 1 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 2	Telecom 2 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 35,584,900	\$ -	\$ 35,584,900	\$ -
Substation Project Costs	\$ 13,236,828	\$ -	\$ 13,236,828	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 48,821,728	\$ -	\$ 48,821,728	\$ -
Owners Cost				
Preliminary Engineering	\$ 50,000	\$ -	\$ 50,000	\$ -
Siting	\$ 25,000	\$ -	\$ 25,000	\$ -
Protection Settings	\$ 16,000	\$ -	\$ 16,000	\$ -
Land	\$ 2,377,115	\$ -	\$ 2,377,115	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 2,468,115	\$ -	\$ 2,468,115	\$ -
Distributed Cost				
Distributed Cost	\$ 2,051,594	\$ -	\$ 2,051,594	\$ -
Contingency	\$ 5,334,144	\$ -	\$ 5,334,144	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 7,385,737	\$ -	\$ 7,385,737	\$ -
Indirect Costs				
E&S	\$ 4,694,046	\$ -	\$ 4,694,046	\$ -
AFUDC	\$ 5,893,375	\$ -	\$ 5,893,375	\$ -
Sub - Total	\$ 10,587,422	\$ -	\$ 10,587,422	\$ -
Total Project Cost	\$ 69,263,002	\$ -	\$ 69,263,002	\$ -





Stage II (2017)

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3b Stage 5 (2017). Revised version as per AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 40,645,418	\$ -	\$ 40,645,418	\$ -
Substation Facilities	\$ 50,490,000	\$ -	\$ 50,490,000	\$ -
Telecommunication	\$ 577,540	\$ -	\$ 577,540	\$ -
Total Facility Costs	\$ 91,712,958	\$ -	\$ 91,712,958	\$ -
Owners Costs	\$ 7,392,870	\$ -	\$ 7,392,870	\$ -
Distributed Costs	\$ 6,126,900	\$ -	\$ 6,126,900	\$ -
Contingency	\$ 10,523,273	\$ -	\$ 10,523,273	\$ -
Total Owners and Dist. Costs	\$ 24,043,043	\$ -	\$ 24,043,043	\$ -
Total Direct Costs	\$ 115,756,001	\$ -	\$ 115,756,001	\$ -
Salvage Costs	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
E&S	\$ 9,516,480	\$ -	\$ 9,516,480	\$ -
AFUDC	\$ 9,250,019	\$ -	\$ 9,250,019	\$ -
Total Indirect Costs	\$ 21,966,499	\$ -	\$ 21,966,499	\$ -
TOTAL PROJECT COSTS	\$ 137,722,499	\$ -	\$ 137,722,499	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3b Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$ 2,560,000	\$ -	\$ 2,560,000	\$ -
	Materials	\$ 640,000	\$ -	\$ 640,000	\$ -
	Sub - Total	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
D/C one side string 240kV 2x795 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km				
	Labour	\$ 8,955,651	\$ -	\$ 8,955,651	\$ -
	Materials	\$ 3,501,201	\$ -	\$ 3,501,201	\$ -
	Sub - Total	\$ 12,456,852	\$ -	\$ 12,456,852	\$ -
String the open side of the 240kV D/C 2 x 795 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,905,724	\$ -	\$ 3,905,724	\$ -

	Materials	\$ 1,618,441	\$ -	\$ 1,618,441
	Sub - Total	\$ 5,524,165	\$ -	\$ 5,524,165
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)	40 Km			
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117
String the open side of the 240kV D/C 2 x 795 mcm from Oakland to Lanfine (9L65)	87 Km			
	Labour	\$ 8,942,051	\$ -	\$ 8,942,051
	Materials	\$ 3,705,377	\$ -	\$ 3,705,377
	Sub - Total	\$ 12,647,428	\$ -	\$ 12,647,428
TOTAL - Transmission Line Project Costs		\$ 40,645,418	\$ -	\$ 40,645,418
TOTAL - Transmission Line Salvage Costs		\$3,200,000	\$-	\$3,200,000

\$ -
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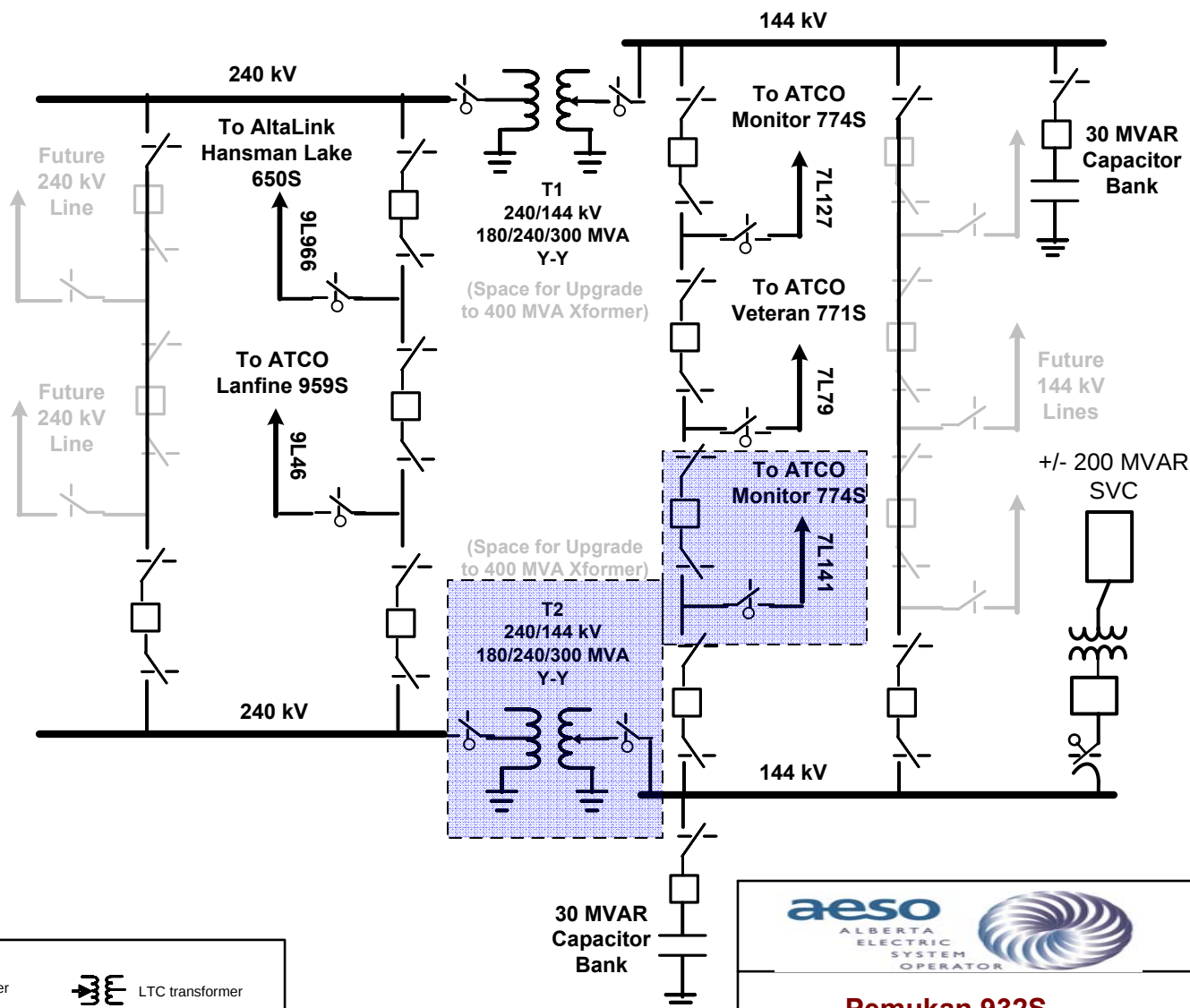
Substation - NID Estimate

Alt 3b Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
946S Oakland Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 5,510,000	\$ -	\$ 5,510,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ -	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
774S Monitor Substation				
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$150,000	\$-	\$150,000	\$-
Circuit Breakers (1x 72kV)	\$160,000	\$-	\$160,000	\$-
PTs (3 x 1Ø 72kV)	\$60,000	\$-	\$60,000	\$-
CTs (1 x 3Ø 72kV)	\$50,000	\$-	\$50,000	\$-
Switch Yard and Substation Control Building	\$400,000	\$-	\$400,000	\$-
Protection, control, metering	\$150,000	\$-	\$150,000	\$-
SCADA	\$50,000	\$-	\$50,000	\$-
<Misc.>	\$100,000	\$-	\$100,000	\$-
Sub - Total	\$1,120,000	\$-	\$1,120,000	\$-
963S Coyote Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -

	Sub - Total	\$ 13,000,000	\$ -	\$ 13,000,000	\$ -
	959S Lanfine Substation				
	Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
	Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
	PTs (3x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
	CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
	Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
	PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
	CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
	Switch Yard and Substation Control Building	\$ 3,750,000	\$ -	\$ 3,750,000	\$ -
	Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
	SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
	<Misc.>	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -
	Sub - Total	\$ 13,000,000	\$ -	\$ 13,000,000	\$ -
	TOTAL - Substation Project Costs	\$ 50,490,000	\$ -	\$ 50,490,000	\$ -

Telecommunication NID Estimate

Alt 3b Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
Misc Telecom Support					
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Substation					
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540	\$ -	\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 577,540	\$ -	\$ 577,540	\$ -



Legend

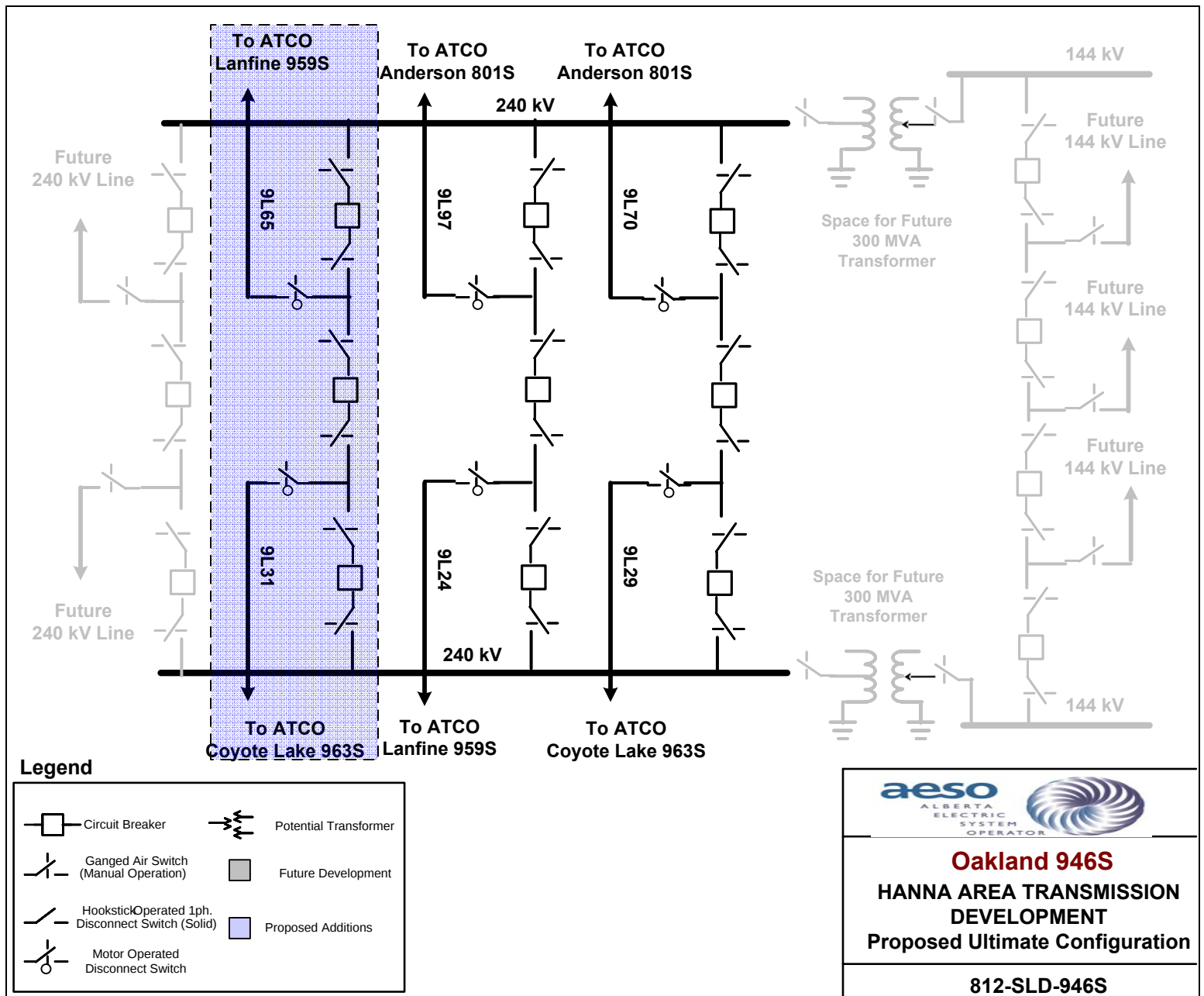
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Future Development
	Hookstick Operated 1ph. Disconnect Switch (Solid)		Proposed Additions
	Motor Operated Disconnect Switch		

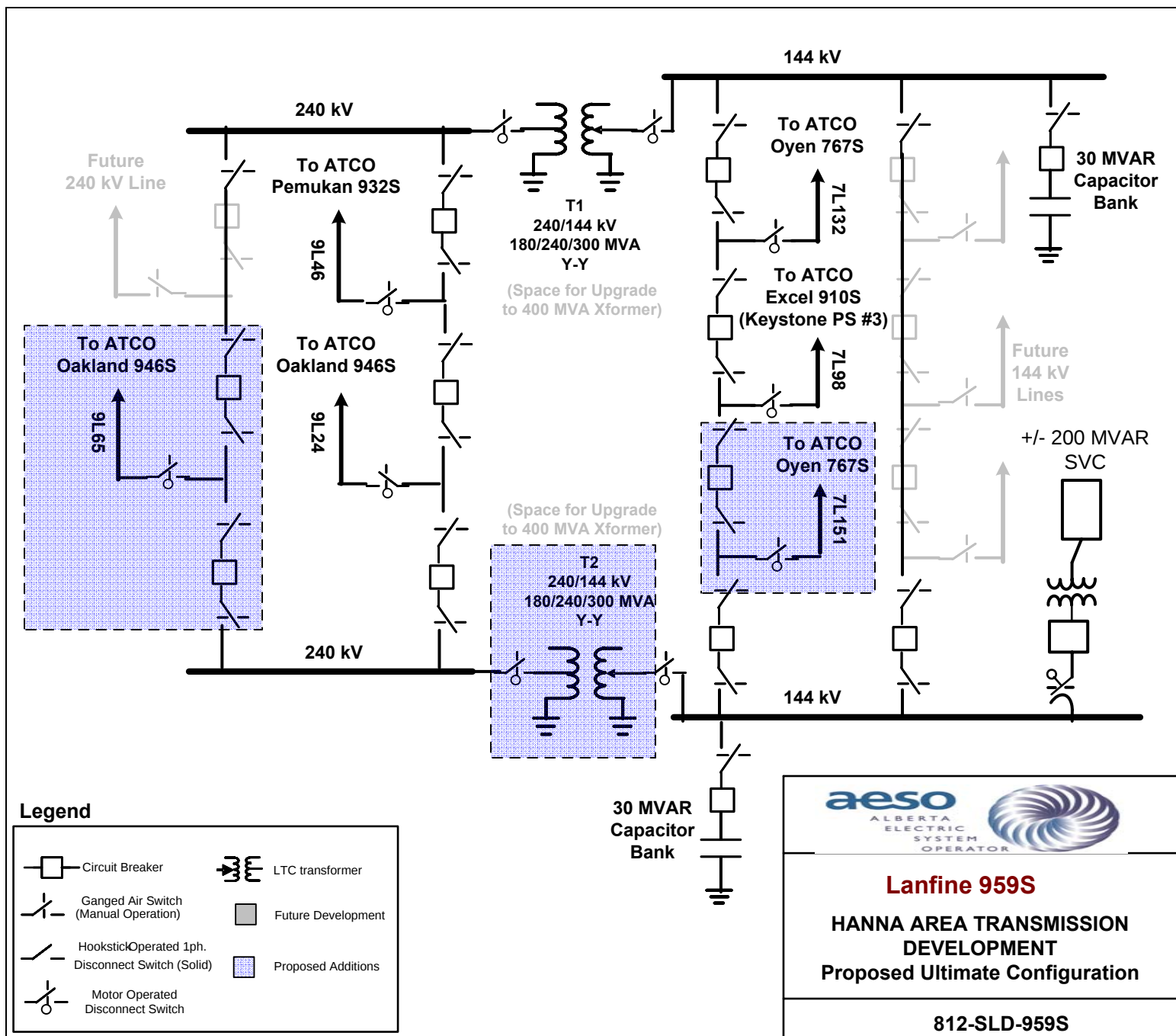


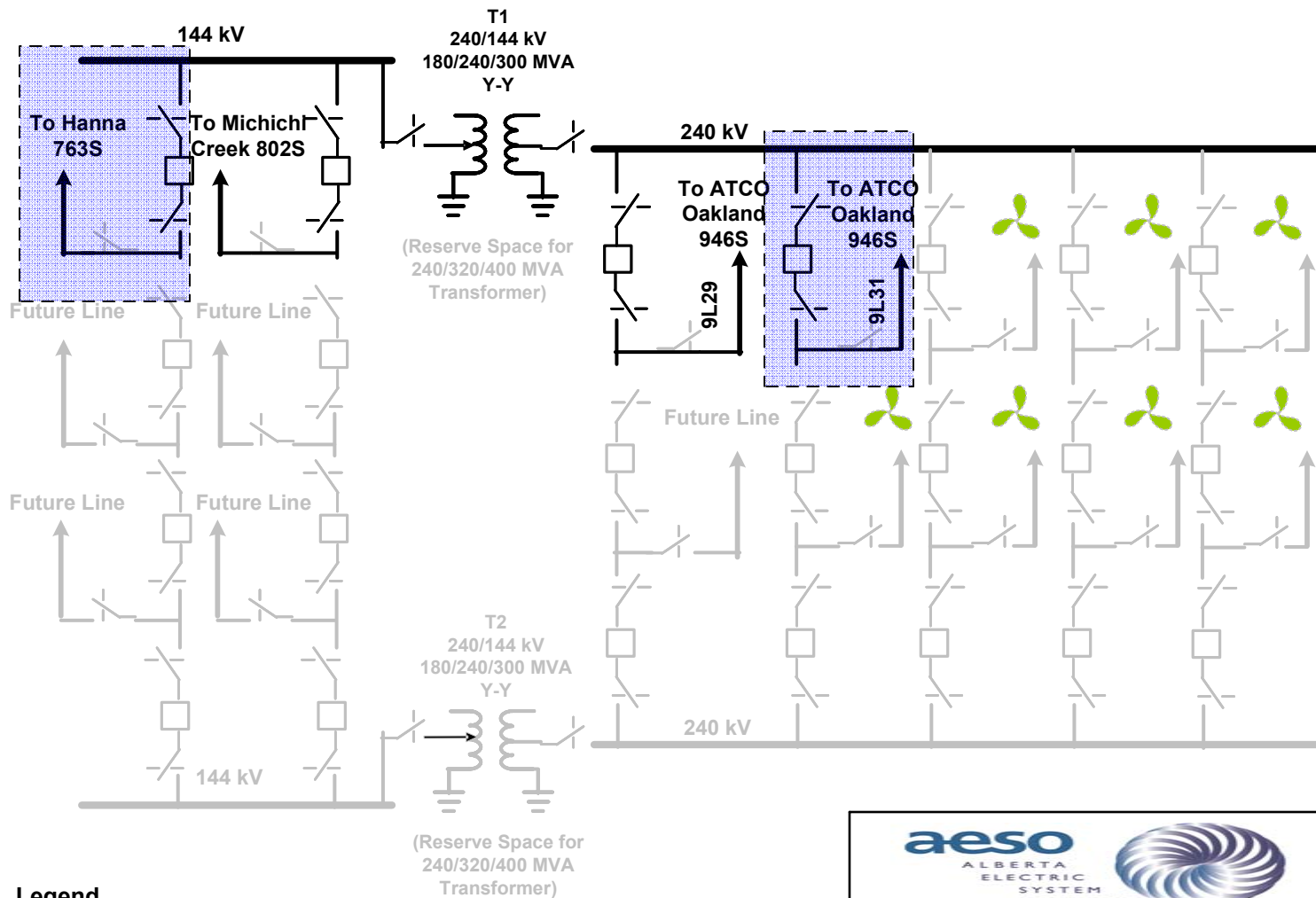
Pemukan 932S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

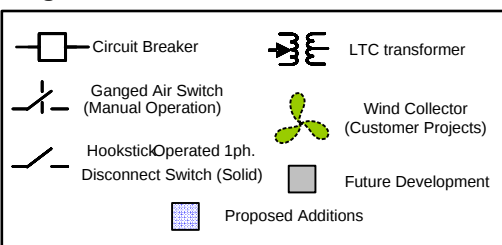
812-SLD-932S







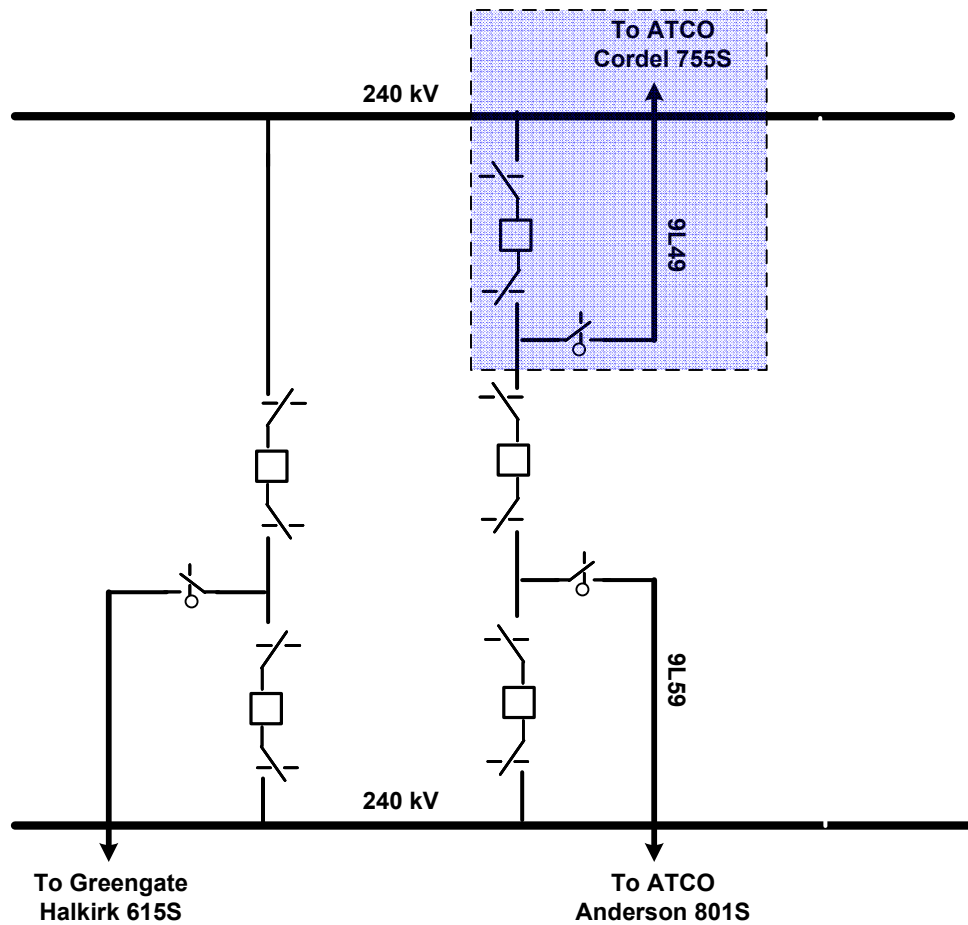
Legend



Coyote Lake 963S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

812-SLD-963S



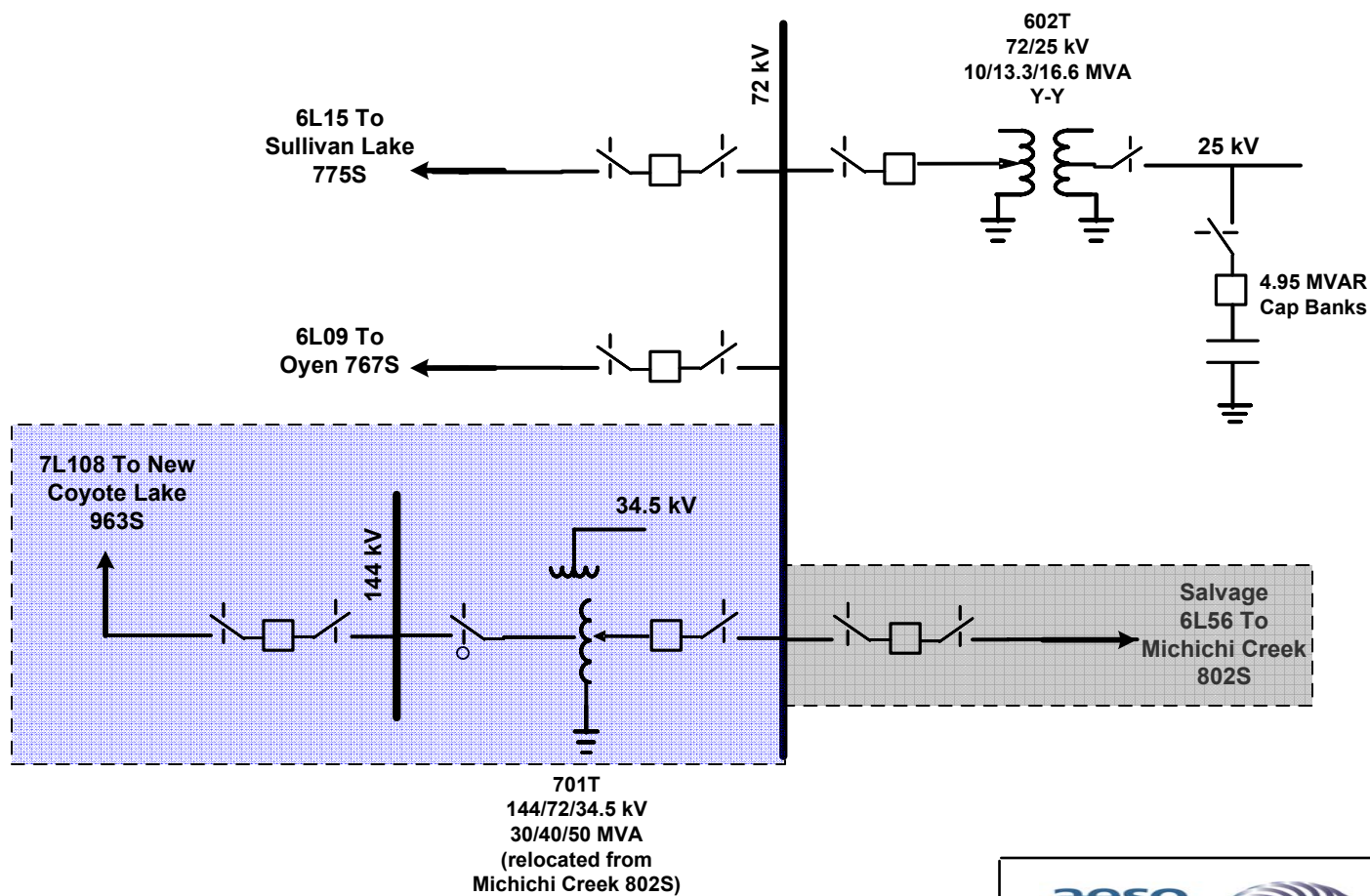
Legend

	Circuit Breaker		Potential Transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		
	Motor Operated Disconnect Switch		



Halkirk Switching Stn. 401S
HANNA AREA TRANSMISSION DEVELOPMENT
Proposed Ultimate Configuration

812-SLD-401S



Legend

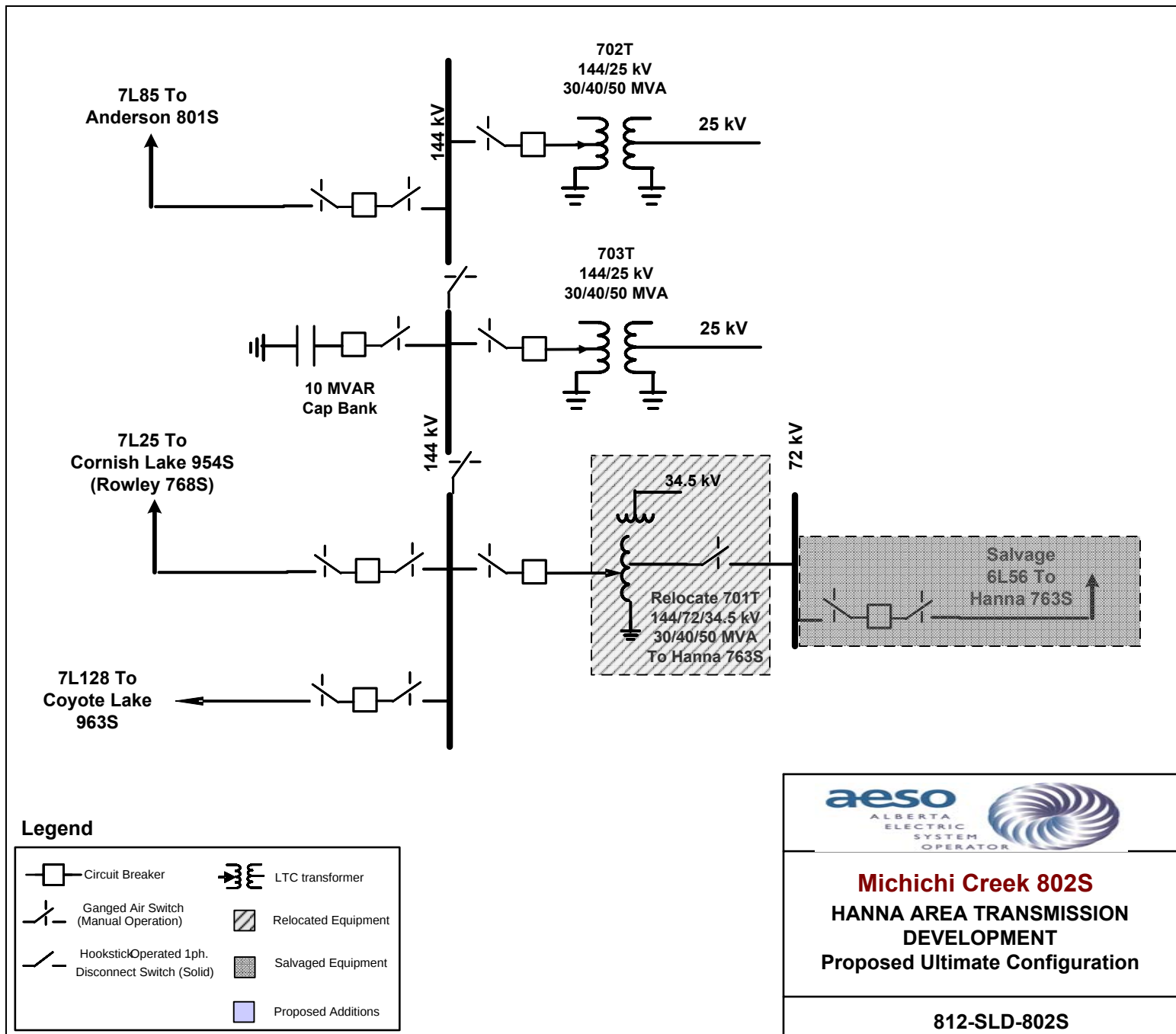
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Motor Operated Disconnect Switch		Salvaged Equipment



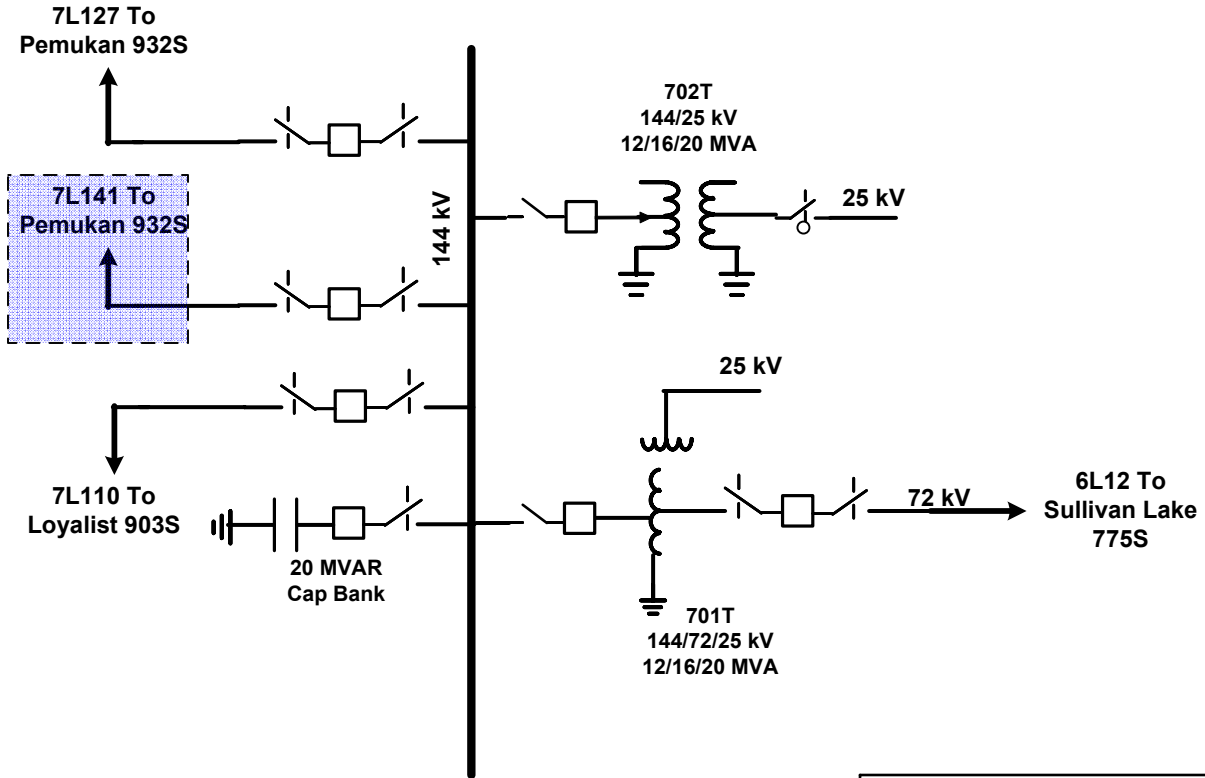
Hanna 763S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

812-SLD-763S



Note: 7L224 to Hansman Lake Disconnected to Provide 144 kV Bay for 7L141



Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		
	Motor Operated Disconnect Switch		

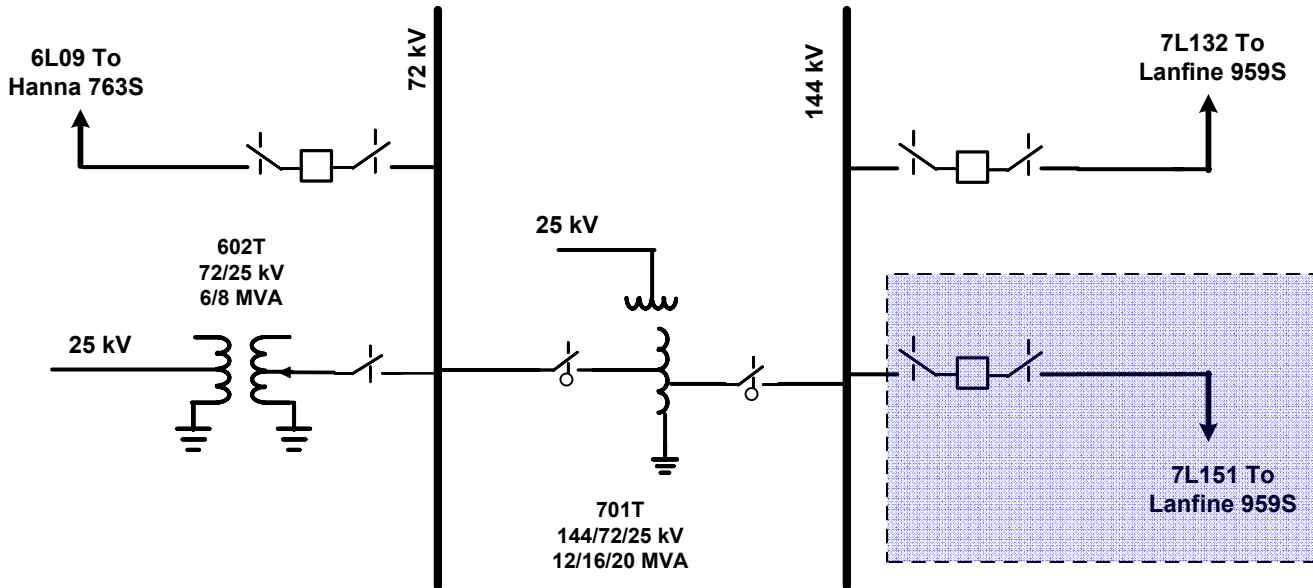


Monitor 774S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

812-SLD-774S

Note: 7L760 to Amoco Empress 163S
Disconnected to provide 144 kV Bay for 7L151



Legend

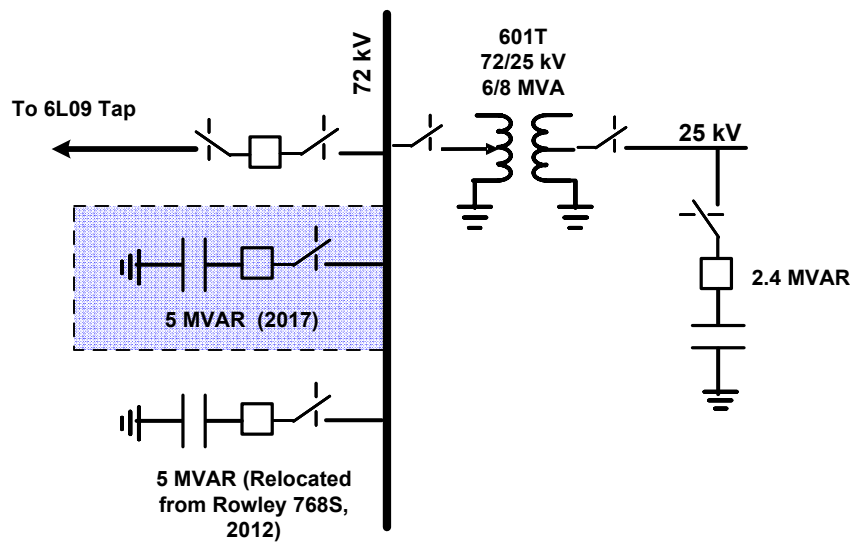
	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Hookstick Operated 1ph. Disconnect Switch (Solid)
	Motor Operated Disconnect Switch		Proposed Additions



Oyen 767S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

812-SLD-767S



Legend

	Circuit Breaker		LTC transformer
	Ganged Air Switch (Manual Operation)		Proposed Additions
	Hookstick Operated 1ph. Disconnect Switch (Solid)		



Youngstown 772S

**HANNA AREA TRANSMISSION
DEVELOPMENT
Proposed Ultimate Configuration**

812-SLD-772S

Estimate Summary for Need Identification Document (NID)



Project: Hanna Area Transmission Development
 - Development 4 (2009\$)
TFO: AltaLink
Prepared by: Teshmont
Date: April 22, 2009
Accuracy: +30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 5,852,000	\$ 5,852,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 5,852,000	\$ 5,852,000
Owners Costs	\$ -	\$ 85,000	\$ 85,000
Distributed Costs	\$ -	\$ 1,887,000	\$ 1,887,000
Total Owners and Dist. Costs	\$ -	\$ 1,972,000	\$ 1,972,000
Total Direct Costs	\$ -	\$ 7,824,000	\$ 7,824,000
Salvage Costs		\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 626,000	\$ 626,000
AFUDC	\$ -	\$ 786,000	\$ 786,000
Total Indirect Costs	\$ -	\$ 1,412,000	\$ 1,412,000
TOTAL PROJECT COSTS	\$ -	\$ 9,236,000	\$ 9,236,000

Capital Maintenance
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Assumptions and Risks

See attached Project Estimating Assumptions.

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	240/138 kV Transformer < qty: 1, 120/160/200 MVA>	\$ -	\$ 3,721,366	\$ 3,721,366	\$ -
	138 kV Circuit Breakers < qty: 1 live tank and 2 dead tank>	\$ -	\$ 657,504	\$ 657,504	\$ -
	138 kV Disconnects <qty: 5 Manual>	\$ -	\$ 319,556	\$ 319,556	\$ -
	138 kV CVT's, CT's and SA's <qty: 3 PT>	\$ -	\$ 204,849	\$ 204,849	\$ -
	Protection, control, metering	\$ -	\$ 253,572	\$ 253,572	\$ -
	SCADA	\$ -	\$ 27,500	\$ 27,500	
	Switch Yard	\$ -	\$ 495,520	\$ 495,520	
	Site Developments	\$ -	\$ 115,419	\$ 115,419	
	Station Energization	\$ -	\$ 56,298	\$ 56,298	\$ -
Sub - Total		\$ -	\$ 5,851,583	\$ 5,851,583	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 5,851,583	\$ 5,851,583	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 5,851,583	\$ 5,851,583	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 5,851,583	\$ 5,851,583	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 20,000	\$ 20,000	\$ -
Protection Settings	\$ -	\$ 40,000	\$ 40,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 85,000	\$ 85,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 1,175,444	\$ 1,175,444	\$ -
Contingency	\$ -	\$ 711,203	\$ 711,203	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,886,647	\$ 1,886,647	\$ -
Indirect Costs				
E&S	\$ -	\$ 625,858	\$ 625,858	\$ -
AFUDC	\$ -	\$ 785,765	\$ 785,765	\$ -
Sub - Total	\$ -	\$ 1,411,624	\$ 1,411,624	\$ -
Total Project Cost	\$ -	\$ 9,234,854	\$ 9,234,854	\$ -

ALTA LINK

Project:	Hanna Area Transmission Development - Development 6 (2009\$)
TFO:	AltaLink
Prepared by:	Teshmont
Date:	April 28, 2009
Accuracy:	+30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 1,766,000	\$ 1,766,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 1,766,000	\$ 1,766,000
Owners Costs	\$ -	\$ 55,000	\$ 55,000
Distributed Costs	\$ -	\$ 547,000	\$ 547,000
Total Owners and Dist. Costs	\$ -	\$ 602,000	\$ 602,000
Total Direct Costs	\$ -	\$ 2,368,000	\$ 2,368,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 189,000	\$ 189,000
AFUDC	\$ -	\$ 179,000	\$ 179,000
Total Indirect Costs	\$ -	\$ 368,000	\$ 368,000
TOTAL PROJECT COSTS	\$ -	\$ 2,736,000	\$ 2,736,000

Capital Maintenance	
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Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	240 kV Circuit Breakers < qty: 1 live tank>	\$ -	\$ 407,191	\$ 407,191	\$ -
	240 kV Disconnects <qty: 1 Manual operated>	\$ -	\$ 84,979	\$ 84,979	\$ -
	240 kV Capacitor Bank <qty: 1, 36 MVAR>	\$ -	\$ 467,725	\$ 467,725	\$ -
	240 kV PT's, CT's & SA's <qty: 1 CT>	\$ -	\$ 155,698	\$ 155,698	\$ -
	Protection, control, metering	\$ -	\$ 329,860	\$ 329,860	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Switch Yard	\$ -	\$ 136,138	\$ 136,138	\$ -
	Site Developments	\$ -	\$ 108,074	\$ 108,074	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
Sub - Total		\$ -	\$ 1,765,845	\$ 1,765,845	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 1,765,845	\$ 1,765,845	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 1,765,845	\$ 1,765,845	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,765,845	\$ 1,765,845	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 15,000	\$ 15,000	\$ -
Protection Settings	\$ -	\$ 15,000	\$ 15,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 55,000	\$ 55,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 332,080	\$ 332,080	\$ -
Contingency	\$ -	\$ 215,293	\$ 215,293	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 547,373	\$ 547,373	\$ -
Indirect Costs				
E&S	\$ -	\$ 189,457	\$ 189,457	\$ -
AFUDC	\$ -	\$ 179,037	\$ 179,037	\$ -
Sub - Total	\$ -	\$ 368,495	\$ 368,495	\$ -
Total Project Cost	\$ -	\$ 2,736,712	\$ 2,736,712	\$ -

Estimate Summary for Need Identification Document (NID)



Project: Hanna Area Transmission Development
 - Development 10 (2009\$)
TFO: AltaLink
Prepared by: Teshmont
Date: April 29, 2009
Accuracy: +30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 1,453,000	\$ 1,453,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 1,453,000	\$ 1,453,000
Owners Costs	\$ -	\$ 75,000	\$ 75,000
Distributed Costs	\$ -	\$ 455,000	\$ 455,000
Total Owners and Dist. Costs	\$ -	\$ 530,000	\$ 530,000
Total Direct Costs	\$ -	\$ 1,983,000	\$ 1,983,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 159,000	\$ 159,000
AFUDC	\$ -	\$ 199,000	\$ 199,000
Total Indirect Costs	\$ -	\$ 358,000	\$ 358,000
TOTAL PROJECT COSTS	\$ -	\$ 2,341,000	\$ 2,341,000

Capital Maintenance
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Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

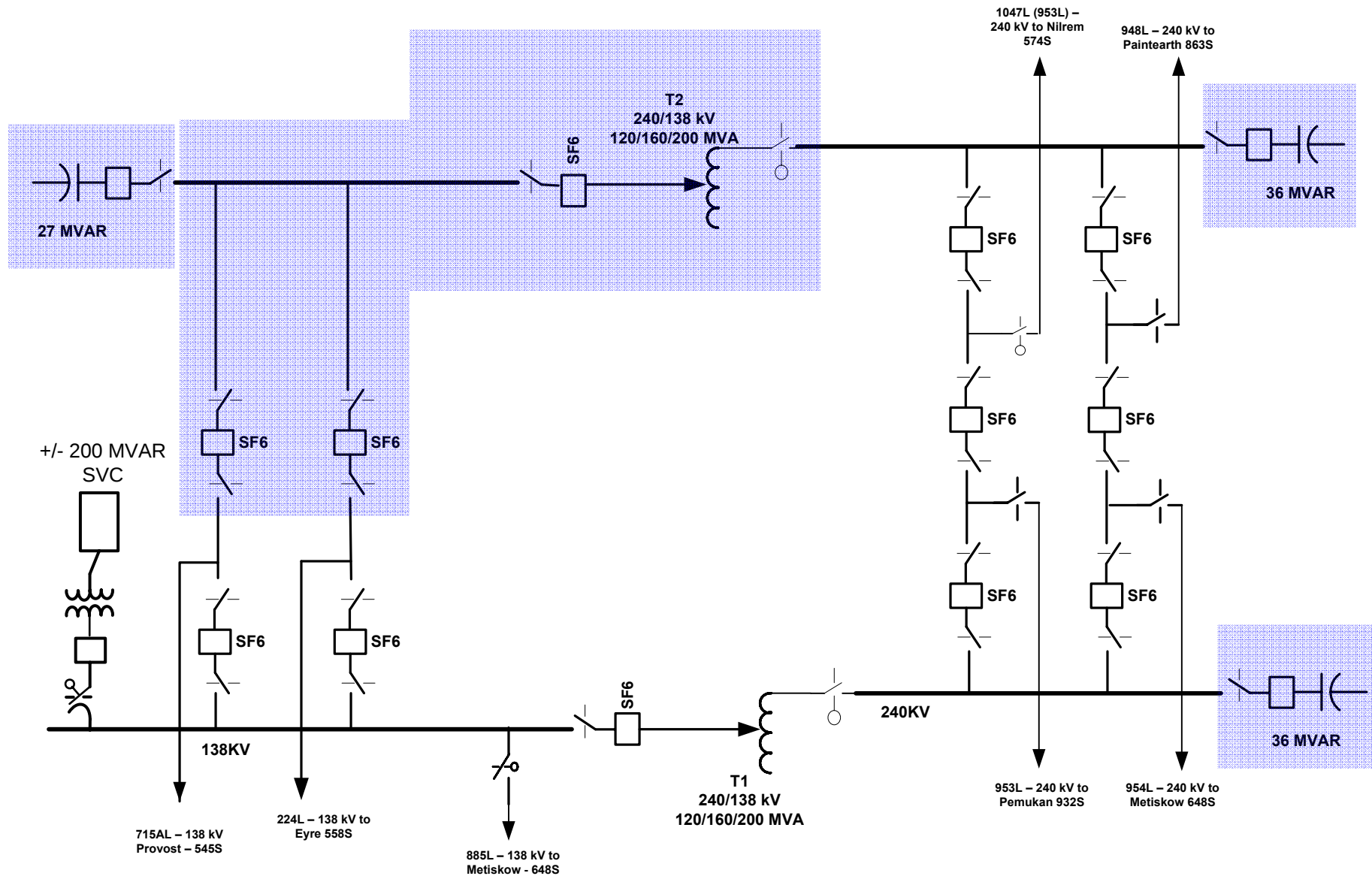
		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	138 kV Disconnects <qty: 1 Manual operated>	\$ -	\$ 92,389	\$ 92,389	\$ -
	138 kV Capacitor Bank <qty: 1, 27 MVAR>	\$ -	\$ 435,725	\$ 435,725	\$ -
	Protection, control, metering	\$ -	\$ 411,640	\$ 411,640	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Switch Yard	\$ -	\$ 88,116	\$ 88,116	\$ -
	Site Developments	\$ -	\$ 84,712	\$ 84,712	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
	Sub - Total	\$ -	\$ 1,452,943	\$ 1,452,943	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 1,452,943	\$ 1,452,943	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 1,452,943	\$ 1,452,943	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,452,943	\$ 1,452,943	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 15,000	\$ 15,000	\$ -
Protection Settings	\$ -	\$ 35,000	\$ 35,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 75,000	\$ 75,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 274,724	\$ 274,724	\$ -
Contingency	\$ -	\$ 180,267	\$ 180,267	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 454,991	\$ 454,991	\$ -
Indirect Costs				
E&S	\$ -	\$ 158,635	\$ 158,635	\$ -
AFUDC	\$ -	\$ 199,166	\$ 199,166	\$ -
Sub - Total	\$ -	\$ 357,801	\$ 357,801	\$ -
Total Project Cost	\$ -	\$ 2,340,734	\$ 2,340,734	\$ -



LEGEND:

	Substation Fence		Transformer		Fuse		Proposed Additions
	Motorized Air Break		Circuit Breaker		Generation		Disconnect Switch
	AutoTransformer		Capacitor Bank		Motorized air break with arcing horn		Ganged Air Switch

HANSMAN LAKE 650S Hanna Area Transmission Development Proposed Ultimate Configuration

812-SLD-650S

ALTA LINK

Project:	Hanna Area Transmission Development - Development 7 (2009\$)
TFO:	AltaLink
Prepared by:	Teshmont
Date:	April 7, 2009
Accuracy:	+30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 1,370,000	\$ 1,370,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 1,370,000	\$ 1,370,000
Owners Costs	\$ -	\$ 75,000	\$ 75,000
Distributed Costs	\$ -	\$ 430,000	\$ 430,000
Total Owners and Dist. Costs	\$ -	\$ 505,000	\$ 505,000
Total Direct Costs	\$ -	\$ 1,875,000	\$ 1,875,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 150,000	\$ 150,000
AFUDC	\$ -	\$ 188,000	\$ 188,000
Total Indirect Costs	\$ -	\$ 338,000	\$ 338,000
TOTAL PROJECT COSTS	\$ -	\$ 2,213,000	\$ 2,213,000

Capital Maintenance	
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Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

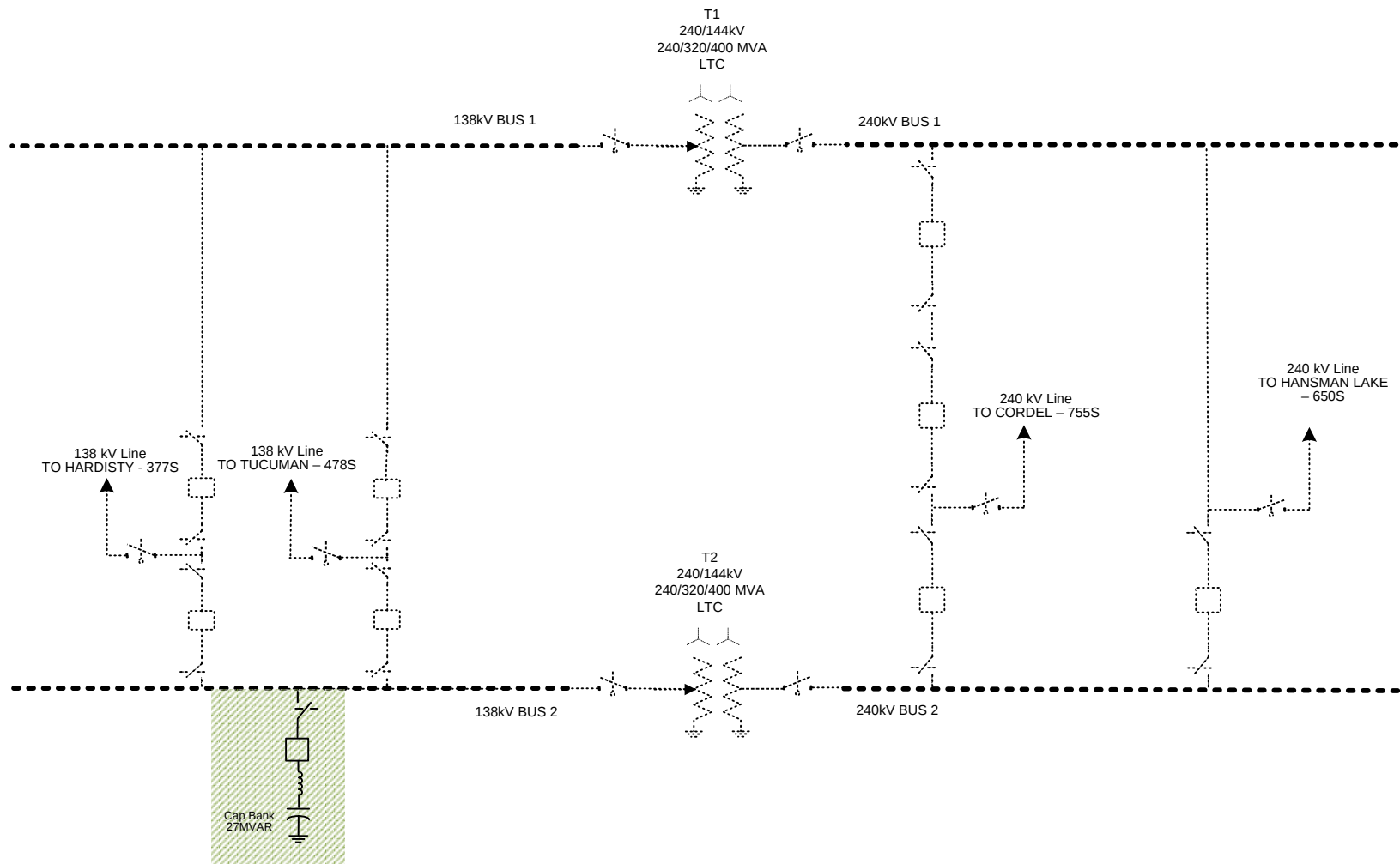
		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Nilrem 574S				
	138 kV Circuit Breakers < qty: 1 dead tank>	\$ -	\$ 264,181	\$ 264,181	\$ -
	138 kV Disconnects <qty: 1 Manual operated>	\$ -	\$ 92,389	\$ 92,389	\$ -
	138 kV Capacitor Bank <qty: 1, 27 MVAR>	\$ -	\$ 435,725	\$ 435,725	\$ -
	Protection, control, metering	\$ -	\$ 411,640	\$ 411,640	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Switch Yard	\$ -	\$ 84,994	\$ 84,994	\$ -
	Site Developments	\$ -	\$ 5,270	\$ 5,270	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
Sub - Total		\$ -	\$ 1,370,379	\$ 1,370,379	\$ -
TOTAL - Substation Project Costs					\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 1,370,379	\$ 1,370,379	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,370,379	\$ 1,370,379	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 15,000	\$ 15,000	\$ -
Protection Settings	\$ -	\$ 35,000	\$ 35,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 75,000	\$ 75,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 259,326	\$ 259,326	\$ -
Contingency	\$ -	\$ 170,470	\$ 170,470	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 429,796	\$ 429,796	\$ -
Indirect Costs				
E&S	\$ -	\$ 150,014	\$ 150,014	\$ -
AFUDC	\$ -	\$ 188,343	\$ 188,343	\$ -
Sub - Total	\$ -	\$ 338,357	\$ 338,357	\$ -
Total Project Cost	\$ -	\$ 2,213,532	\$ 2,213,532	\$ -



Legend

	Circuit Breaker		LTC Transformer
	Ganged Air-Switch (Motor Operated)		Shunt Power Capacitor
	Ganged Air-Switch (Manual Operated)		Power Reactor
	Existing		Equipment Added in Separate Development
	2012 Development		2017 Development

Note:
Assumption: the substation will be built by 2012.

ALTALINK

Hanna Area Transmission Development
Development 7 – Nilrem 574S
Proposed Development

Date:	By:	SLD No.
2009-04-07		09-307

Estimate Summary for Need Identification Document (NID)



Project: Hanna Area Transmission Development
 - Development 8 (2009\$)
TFO: AltaLink
Prepared by: Teshmont
Date: April 29, 2009
Accuracy: +30%/-30%

	Customer Portion	System Portion	TOTAL
Transmission Lines	\$ -	\$ -	\$ -
Substation Facilities	\$ -	\$ 1,501,000	\$ 1,501,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ -	\$ 1,501,000	\$ 1,501,000
Owners Costs	\$ -	\$ 75,000	\$ 75,000
Distributed Costs	\$ -	\$ 470,000	\$ 470,000
Total Owners and Dist. Costs	\$ -	\$ 545,000	\$ 545,000
Total Direct Costs	\$ -	\$ 2,046,000	\$ 2,046,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ -	\$ 164,000	\$ 164,000
AFUDC	\$ -	\$ 155,000	\$ 155,000
Total Indirect Costs	\$ -	\$ 319,000	\$ 319,000
TOTAL PROJECT COSTS	\$ -	\$ 2,365,000	\$ 2,365,000

Capital Maintenance
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Assumptions and Risks

Transmission Line - NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -

Substation - NID Estimate

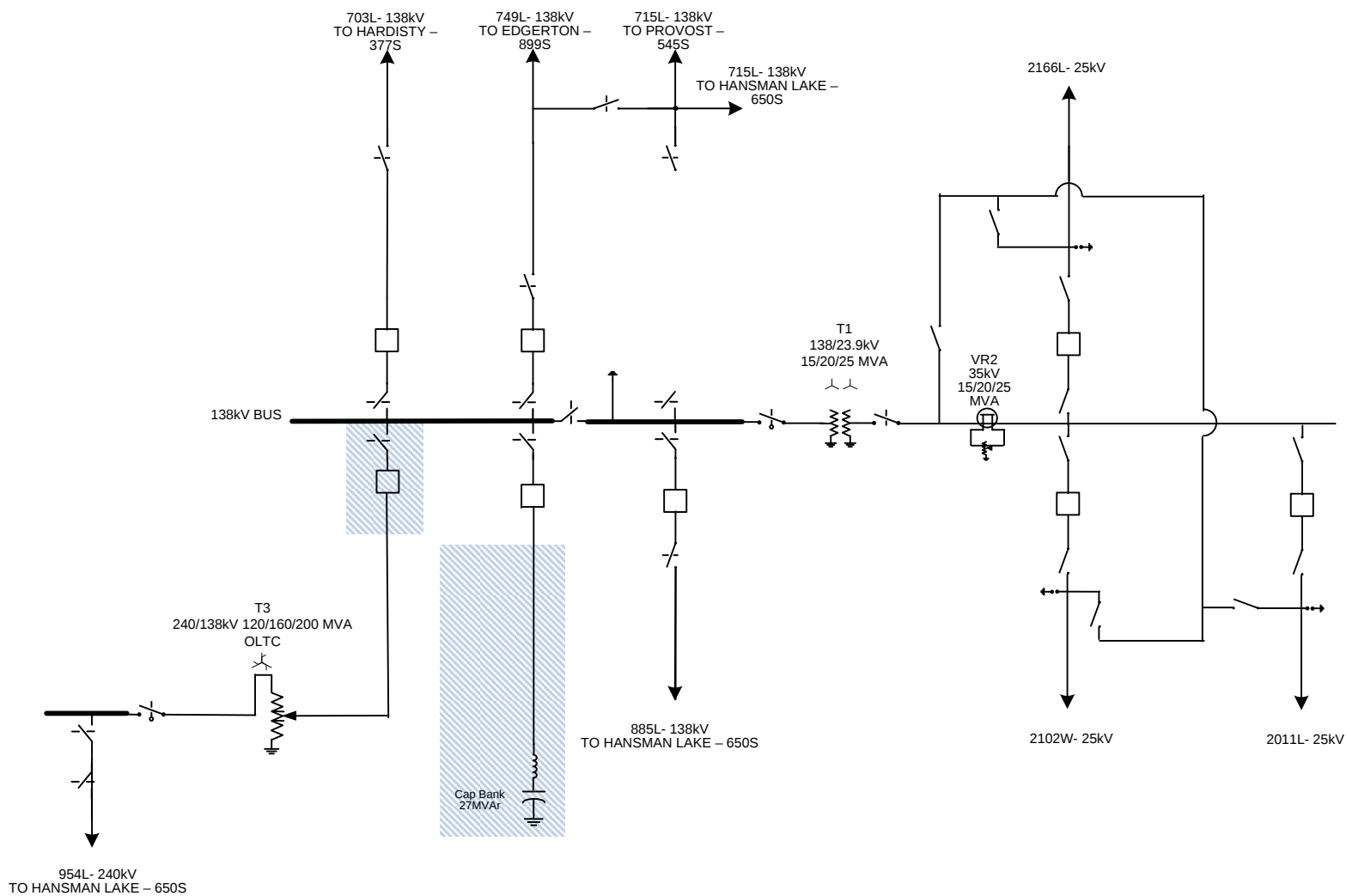
		Customer Portion	System Portion	TOTAL	Capital Maintenance
Sub 1	Metiskow 648S				
	138 kV Circuit Breakers < qty: 1 dead tank>	\$ -	\$ 264,181	\$ 264,181	\$ -
	138 kV Disconnects <qty: 1 Manual operated>	\$ -	\$ 92,389	\$ 92,389	\$ -
	138 kV Capacitor Bank <qty: 1, 27 MVAR>	\$ -	\$ 435,725	\$ 435,725	\$ -
	Protection, control, metering	\$ -	\$ 411,640	\$ 411,640	\$ -
	SCADA	\$ -	\$ 25,000	\$ 25,000	\$ -
	Switch Yard	\$ -	\$ 217,405	\$ 217,405	\$ -
	Site Developments	\$ -	\$ 3,620	\$ 3,620	\$ -
	Station Energization	\$ -	\$ 51,180	\$ 51,180	\$ -
	Sub - Total	\$ -	\$ 1,501,140	\$ 1,501,140	\$ -
TOTAL - Substation Project Costs		\$ -	\$ 1,501,140	\$ 1,501,140	\$ -

Telecommunication NID Estimate

	Customer Portion	System Portion	TOTAL	Capital Maintenance
TOTAL - Telecommunication Project Costs	\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	Customer Portion	System Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ -	\$ -	\$ -	\$ -
Substation Project Costs	\$ -	\$ 1,501,140	\$ 1,501,140	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 1,501,140	\$ 1,501,140	\$ -
Owners Cost				
Preliminary Engineering	\$ -	\$ 25,000	\$ 25,000	\$ -
Siting	\$ -	\$ 15,000	\$ 15,000	\$ -
Protection Settings	\$ -	\$ 35,000	\$ 35,000	\$ -
Land	\$ -	\$ -	\$ -	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 75,000	\$ 75,000	\$ -
Distributed Cost				
Distributed Cost	\$ -	\$ 283,713	\$ 283,713	\$ -
Contingency	\$ -	\$ 185,985	\$ 185,985	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ -	\$ 469,698	\$ 469,698	\$ -
Indirect Costs				
E&S	\$ -	\$ 163,667	\$ 163,667	\$ -
AFUDC	\$ -	\$ 154,665	\$ 154,665	\$ -
Sub - Total	\$ -	\$ 318,332	\$ 318,332	\$ -
Total Project Cost	\$ -	\$ 2,364,170	\$ 2,364,170	\$ -



Legend

	Circuit Breaker		LTC Transformer
	Ganged Air-Switch (Motor Operated)		Shunt Power Capacitor
	Ganged Air-Switch (Manual Operated)		Power Reactor
	Existing		Equipment Added in Separate Development
	2012 Development		2017 Development

ALTALINK

Hanna Area Transmission Development
Development 8 - Metiskow 648S
Proposed Development

Date:

2009-04-07

By:



SLD No.

09-301

OTHER ALTERNATIVES

Estimate Summary for Need Identification Document (NID)

Project: **Hanna Area Transmission
Development - Alternative 1a Stage 1
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

NID Estimate is valid for 90 days from Aug 06, 2009

+/- 30 %



THE POWER OF POSSIBILITY

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 72,858,402	\$ -	\$ 72,858,402	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 159,670,062	\$ -	\$ 159,670,062	\$ -
Owners Costs	\$ 12,284,289	\$ -	\$ 12,284,289	\$ -
Distributed Costs	\$ 6,919,439	\$ -	\$ 6,919,439	\$ -
Contingency	\$ 17,887,379	\$ -	\$ 17,887,379	\$ -
Total Owners and Dist. Costs	\$ 37,091,107	\$ -	\$ 37,091,107	\$ -
Total Direct Costs	\$ 196,761,169	\$ -	\$ 196,761,169	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 15,740,894	\$ -	\$ 15,740,894	\$ -
AFUDC	\$ 15,300,149	\$ -	\$ 15,300,149	\$ -
Total Indirect Costs	\$ 31,041,042	\$ -	\$ 31,041,042	\$ -
TOTAL PROJECT COSTS	\$ 227,802,211	\$ -	\$ 227,802,211	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 1a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 477 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 28,923,480	\$ -	\$ 28,923,480	\$ -
	Materials	\$ 10,788,360	\$ -	\$ 10,788,360	\$ -
	Sub - Total	\$ 39,711,840	\$ -	\$ 39,711,840	\$ -
D/C 2x 477 mcm 240 kV Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,494,262	\$ -	\$ 3,494,262	\$ -
	Materials	\$ 1,410,269	\$ -	\$ 1,410,269	\$ -
	Sub - Total	\$ 4,904,531	\$ -	\$ 4,904,531	\$ -
D/C 2x 477 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 17,558,214	\$ -	\$ 17,558,214	\$ -
	Materials	\$ 6,832,631	\$ -	\$ 6,832,631	\$ -
	Sub - Total	\$ 24,390,845	\$ -	\$ 24,390,845	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 72,858,402	\$ -	\$ 72,858,402	\$ -

Substation - NID Estimate

Alt 1a Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
946S Oakland Substation (New)				
Circuit Breakers (4x 240kV)	\$ 1,600,000	\$ -	\$ 1,600,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 5,000,000	\$ -	\$ 5,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -

Telecommunication NID Estimate

Alt 1a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation		\$ -			
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation		\$ -			
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -

Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200	\$ -
	Sub - Total	\$ 538,900	\$ -	\$ 538,900	\$ -
Fleet- Lonepine 7 GHz Upgrade					
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 348,800	\$ -	\$ 348,800	\$ -
Fleet- Consort 7 GHz Upgrade					
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 379,800	\$ -	\$ 379,800	\$ -
774S Monitor Substation					
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 263,740	\$ -	\$ 263,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 1a Stage 2
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 106,430,359	\$ -	\$ 106,430,359	\$ -
Substation Facilities	\$ 71,450,000	\$ -	\$ 71,450,000	\$ -
Telecommunication	\$ 2,058,640	\$ -	\$ 2,058,640	
Total Facility Costs	\$ 179,938,999	\$ -	\$ 179,938,999	
Owners Costs	\$ 14,497,657	\$ -	\$ 14,497,657	\$ -
Distributed Costs	\$ 7,343,856	\$ -	\$ 7,343,856	\$ -
Contingency	\$ 20,178,051	\$ -	\$ 20,178,051	\$ -
Total Owners and Dist. Costs	\$ 42,019,564	\$ -	\$ 42,019,564	\$ -
Total Direct Costs	\$ 221,958,563	\$ -	\$ 221,958,563	
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 17,756,685	\$ -	\$ 17,756,685	\$ -
AFUDC	\$ 17,259,498	\$ -	\$ 17,259,498	\$ -
Total Indirect Costs	\$ 35,016,183	\$ -	\$ 35,016,183	\$ -
TOTAL PROJECT COSTS	\$ 256,974,746	\$ -	\$ 256,974,746	

**Total Cost Reflects
2009 Dollars**

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 1a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 477 mcm 240 kV from Lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 32,779,944	\$ -	\$ 32,779,944	\$ -
	Materials	\$ 12,226,808	\$ -	\$ 12,226,808	\$ -
	Sub - Total	\$ 45,006,752	\$ -	\$ 45,006,752	\$ -
D/C one side string 2x 477 mcm 240 kV from Oakland to Lanfine (9L24)	87 Km				
	Labour	\$ 40,199,070	\$ -	\$ 40,199,070	\$ -
	Materials	\$ 15,643,128	\$ -	\$ 15,643,128	\$ -
	Sub - Total	\$ 55,842,198	\$ -	\$ 55,842,198	\$ -
D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km				
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025	\$ -
	Materials	\$ 529,198	\$ -	\$ 529,198	\$ -
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223	\$ -
TOTAL - Transmission Line Project Costs		\$ 106,430,359	\$ -	\$ 106,430,359	\$ -

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Substation - NID Estimate

Alt 1a Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
946 Oakland Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000	\$ -
959S Lanfine Substation (New)				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200 Mvar, 144/44kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 1x144kV, 30 Mvar	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
910S Excel Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -

CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000
SCADA	\$ 20,000	\$ -	\$ 20,000
<Misc.>	\$ 50,000	\$ -	\$ 50,000
Sub - Total	\$ 760,000	\$ -	\$ 760,000
932S Pemukan Substation			
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000
SCADA	\$ 50,000	\$ -	\$ 50,000
<Misc.>	\$ 100,000	\$ -	\$ 100,000
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000
TOTAL - Substation Project Costs	\$ 71,450,000	\$ -	\$ 71,450,000

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Telecommunication NID Estimate

Alt 1a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Sub					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -
Pollock-Cappon 7 GHz					
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 341,800	\$ -	\$ 341,800	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,058,640	\$ -	\$ 2,058,640	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 1a Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

NID Estimate is valid for 90 days from Aug 06, 2009

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
Telecommunication	\$ 2,133,440	\$ -	\$ 2,133,440	\$ -
Total Facility Costs	\$ 41,289,619	\$ -	\$ 41,289,619	\$ -
Owners Costs	\$ 4,002,287	\$ -	\$ 4,002,287	\$ -
Distributed Costs	\$ 2,546,045	\$ -	\$ 2,546,045	\$ -
Contingency	\$ 6,248,795	\$ -	\$ 6,248,795	\$ -
Total Owners and Dist. Costs	\$ 12,797,127	\$ -	\$ 12,797,127	\$ -
Total Direct Costs	\$ 54,086,746	\$ -	\$ 54,086,746	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,498,940	\$ -	\$ 5,498,940	\$ -
AFUDC	\$ 5,344,969	\$ -	\$ 5,344,969	\$ -
Total Indirect Costs	\$ 25,493,909	\$ -	\$ 25,493,909	\$ -
TOTAL PROJECT COSTS	\$ 79,580,655	\$ -	\$ 79,580,655	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 1a Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L79)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
Tap 7L25 and build a D/C (7L25 & 7L137) to Rowley	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 4,440,366	\$ -
Tap 7L16 and build a D/C (7L16 & 7L159) to Delburne	3 Km				
	Labour	\$ 438,230	\$ -	\$ 438,230	\$ -
	Materials	\$ 153,819	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 592,049	\$ -
Salvage 7L98 , 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 1a Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar, 144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
New Rowley Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
New Delburne Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,140,000	\$ -	\$ 1,140,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
963S Coyote Lake Substation				
Transformer 1 x 240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -

PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
TOTAL - Salvage Cost	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

Alt 1 Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S Delburne Sub (New)					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
802S Michichi Sub					
	Tower/Antenna	\$ 59,100	\$ -	\$ 59,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 264,740	\$ -	\$ 264,740	\$ -
768S Rowley Sub (New or Expanded)					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
Elnora - Nevis 2 GHz MHSB					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Drum - Wintering 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Wintering - Ander 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
771S Veteran Sub		\$ 74,100			
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,133,440	\$ -	\$ 2,133,440	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 1a Stage 4
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -
Telecommunication	\$ 310,540	\$ -	\$ 310,540	\$ -
Total Facility Costs	\$ 24,140,267	\$ -	\$ 24,140,267	\$ -
Owners Costs	\$ 1,680,880	\$ -	\$ 1,680,880	\$ -
Distributed Costs	\$ 1,229,744	\$ -	\$ 1,229,744	\$ -
Contingency	\$ 3,280,089	\$ -	\$ 3,280,089	\$ -
Total Owners and Dist. Costs	\$ 6,190,713	\$ -	\$ 6,190,713	\$ -
Total Direct Costs	\$ 30,330,980	\$ -	\$ 30,330,980	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 2,886,478	\$ -	\$ 2,886,478	\$ -
AFUDC	\$ 2,805,657	\$ -	\$ 2,805,657	\$ -
Total Indirect Costs	\$ 11,442,135	\$ -	\$ 11,442,135	\$ -
TOTAL PROJECT COSTS	\$ 41,773,116	\$ -	\$ 41,773,116	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 1a Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 Km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 Km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 1a Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
Capacitor Bank (1x144kV, 30 Mvar)	\$ 600,000		\$ 600,000	
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank (1x144kV, 15 Mvar)	\$ 450,000	\$ -	\$ 450,000	
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ -
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ 1
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ -	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ -	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 150,000	\$ -	\$ 150,000	\$ -
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000	\$ -
TOTAL - Substation Project Costs	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -

Telecommunication NID Estimate

Alt 1a Stage 4		System Portion	Customer Portion	TOTAL
769S Stettler Sub				
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560
	Sub - Total	\$ 310,540	\$ -	\$ 310,540
TOTAL - Telecommunication Project Costs		\$ 310,540	\$ -	\$ 310,540

Capital Maintenance
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 1a Stage 5
(2017). Revised version as per AESO
Request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 136,753,972	\$ -	\$ 136,753,972	\$ -
Substation Facilities	\$ 56,990,000	\$ -	\$ 56,990,000	\$ -
Telecommunication	\$ 1,303,380	\$ -	\$ 1,303,380	\$ -
Total Facility Costs	\$ 195,047,352	\$ -	\$ 195,047,352	\$ -
Owners Costs	\$ 23,959,298	\$ -	\$ 23,959,298	\$ -
Distributed Costs	\$ 20,194,963	\$ -	\$ 20,194,963	\$ -
Contingency	\$ 23,920,161	\$ -	\$ 23,920,161	\$ -
Total Owners and Dist. Costs	\$ 68,074,422	\$ -	\$ 68,074,422	\$ -
Total Direct Costs	\$ 263,121,774	\$ -	\$ 263,121,774	\$ -
Salvage Costs	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
E&S	\$ 21,305,742	\$ -	\$ 21,305,742	\$ -
AFUDC	\$ 20,709,181	\$ -	\$ 20,709,181	\$ -
Total Indirect Costs	\$ 45,214,923	\$ -	\$ 45,214,923	\$ -
TOTAL PROJECT COSTS	\$ 308,336,697	\$ -	\$ 308,336,697	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 1a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$ 2,560,000	\$ -	\$ 2,560,000	\$ -
	Materials	\$ 640,000	\$ -	\$ 640,000	\$ -
	Sub - Total	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
D/C 2x 477 mcm 240 kV with one side strung from Oakland to Clement (9L06)	81 Km				
	Labour	\$ 37,426,720	\$ -	\$ 37,426,720	\$ -
	Materials	\$ 14,564,292	\$ -	\$ 14,564,292	\$ -
	Sub - Total	\$ 51,991,012	\$ -	\$ 51,991,012	\$ -
D/C 2x 477 mcm 240 kV with one side strung from Clement to Pemukan (9L14)	90 Km				
	Labour	\$ 41,585,244	\$ -	\$ 41,585,244	\$ -

	Materials	\$ 16,182,547	\$ -	\$ 16,182,547	\$ -
	Sub - Total	\$ 57,767,791	\$ -	\$ 57,767,791	\$ -
D/C 2x 477 mcm 240 kV from Clement and tap into 9L59 (9L59 & 9L63)	2 Km				
	Labour	\$ 998,361	\$ -	\$ 998,361	\$ -
	Materials	\$ 402,934	\$ -	\$ 402,934	\$ -
	Sub - Total	\$ 1,401,295	\$ -	\$ 1,401,295	\$ -
String the open side of the 240kV D/C 2x477 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,200,406	\$ -	\$ 3,200,406	\$ -
	Materials	\$ 1,124,807	\$ -	\$ 1,124,807	\$ -
	Sub - Total	\$ 4,325,213	\$ -	\$ 4,325,213	\$ -
D/c one side string 240kV 2x477 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km				
	Labour	\$ 8,194,986	\$ -	\$ 8,194,986	\$ -
	Materials	\$ 3,056,702	\$ -	\$ 3,056,702	\$ -
	Sub - Total	\$ 11,251,688	\$ -	\$ 11,251,688	\$ -
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)	40 Km				
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126	\$ -
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991	\$ -
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117	\$ -
TOTAL - Transmission Line Project Costs		\$ 136,753,972	\$ -	\$ 136,753,972	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 3,200,000	\$ -	\$ 3,200,000	\$ -

Substation - NID Estimate

Alt 1a Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Transformer (1x 240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 11,050,000	\$ -	\$ 11,050,000	
959S Lanfine Substation				
Transformer (1x 240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 800,000	\$ -	\$ 800,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 7,940,000	\$ -	\$ 7,940,000	\$ -
946S Oakland Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,500,000	\$ -	\$ 1,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 3,760,000	\$ -	\$ 3,760,000	\$ -
988S Clement Substation (New)				
Circuit Breakers (6x 240kV)	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
PTs (18 x 1Ø 240kV)	\$ 540,000	\$ -	\$ 540,000	\$ -
CTs (6 x 3Ø 240kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
Switch Yard and Substation Control Building	\$ 8,750,000	\$ -	\$ 8,750,000	\$ -
Protection, control, metering	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -

[illegible]

PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
774S Monitor Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
763S Hanna Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 200,000	\$ -	\$ 200,000	\$ -
Sub - Total	\$ 5,540,000	\$ -	\$ 5,540,000	\$ -
TOTAL - Substation Project Costs	\$56,990,000	\$ -	\$56,990,000	\$ -

Telecommunication NID Estimate

Alt 1a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
988S Clement Substation					
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Tower/Antenna	\$ 398,700	\$ -	\$ 398,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
Sub - Total		\$ 725,840	\$ -	\$ 725,840	\$ -
Misc Telecom Support					
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Area					
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540	\$ -	\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 1,303,380	\$ -	\$ 1,303,380	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

**Project: Hanna Area Transmission
Development - Alternative 2a Stage 1
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 72,858,402	\$ -	\$ 72,858,402	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 159,670,062	\$ -	\$ 159,670,062	\$ -
Owners Costs	\$ 12,097,508	\$ -	\$ 12,097,508	\$ -
Distributed Costs	\$ 6,793,450	\$ -	\$ 6,793,450	\$ -
Contingency	\$ 17,856,102	\$ -	\$ 17,856,102	\$ -
Total Owners and Dist. Costs	\$ 36,747,060	\$ -	\$ 36,747,060	\$ -
Total Direct Costs	\$ 196,417,122	\$ -	\$ 196,417,122	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 15,713,370	\$ -	\$ 15,713,370	\$ -
AFUDC	\$ 15,273,395	\$ -	\$ 15,273,395	\$ -
Total Indirect Costs	\$ 30,986,765	\$ -	\$ 30,986,765	\$ -
TOTAL PROJECT COSTS	\$ 227,403,887	\$ -	\$ 227,403,887	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 477 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 28,923,480	\$ -	\$ 28,923,480	\$ -
	Materials	\$ 10,788,360	\$ -	\$ 10,788,360	\$ -
	Sub - Total	\$ 39,711,840	\$ -	\$ 39,711,840	\$ -
D/C 2x 477 mcm 240 kV Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,494,262	\$ -	\$ 3,494,262	\$ -
	Materials	\$ 1,410,269	\$ -	\$ 1,410,269	\$ -
	Sub - Total	\$ 4,904,531	\$ -	\$ 4,904,531	\$ -
D/C 2x 477 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 17,558,214	\$ -	\$ 17,558,214	\$ -
	Materials	\$ 6,832,631	\$ -	\$ 6,832,631	\$ -
	Sub - Total	\$ 24,390,845	\$ -	\$ 24,390,845	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 72,858,402	\$ -	\$ 72,858,402	\$ -

Substation - NID Estimate

Alt 2a Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
946S Oakland Substation (New)				
Circuit Breakers (4x 240kV)	\$ 1,600,000	\$ -	\$ 1,600,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 5,000,000	\$ -	\$ 5,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation					
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation					
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -
Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -

	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200	\$ -
	Sub - Total	\$ 538,900	\$ -	\$ 538,900	\$ -
Fleet-Lonepine 7 GHz Upgrade					
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 348,800	\$ -	\$ 348,800	\$ -
Fleet-Consort 7 GHz Upgrade					
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 379,800	\$ -	\$ 379,800	\$ -
774S Monitor Substation					
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 263,740	\$ -	\$ 263,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 2
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 161,748,259	\$ -	\$ 161,748,259	\$ -
Substation Facilities	\$ 91,360,000	\$ -	\$ 91,360,000	\$ -
Telecommunication	\$ 2,784,480	\$ -	\$ 2,784,480	\$ -
Total Facility Costs	\$ 255,892,739	\$ -	\$ 255,892,739	\$ -
Owners Costs	\$ 20,644,160	\$ -	\$ 20,644,160	\$ -
Distributed Costs	\$ 11,097,159	\$ -	\$ 11,097,159	\$ -
Contingency	\$ 28,763,406	\$ -	\$ 28,763,406	\$ -
Total Owners and Dist. Costs	\$ 60,504,725	\$ -	\$ 60,504,725	\$ -
Total Direct Costs	\$ 316,397,464	\$ -	\$ 316,397,464	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 25,311,797	\$ -	\$ 25,311,797	\$ -
AFUDC	\$ 24,603,067	\$ -	\$ 24,603,067	\$ -
Total Indirect Costs	\$ 49,914,864	\$ -	\$ 49,914,864	\$ -
TOTAL PROJECT COSTS	\$ 366,312,328	\$ -	\$ 366,312,328	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C 2x 477 mcm 240 kV with one side strung from Oakland to Clement (9L06)	81 Km				
	Labour	\$ 37,426,720	\$ -	\$ 37,426,720	\$ -
	Materials	\$ 14,564,292	\$ -	\$ 14,564,292	\$ -
	Sub - Total	\$ 51,991,012	\$ -	\$ 51,991,012	\$ -
D/C 2x 477 mcm 240 kV with one side strung from Clement to Pemukan (9L14)	90 Km				
	Labour	\$ 41,585,244	\$ -	\$ 41,585,244	\$ -
	Materials	\$ 16,182,547	\$ -	\$ 16,182,547	\$ -
	Sub - Total	\$ 57,767,791	\$ -	\$ 57,767,791	\$ -
D/C 2x 477 mcm 240 kV from Clement and tap into 9L59 (9L59 & 9L63)	2 Km				
	Labour	\$ 998,361	\$ -	\$ 998,361	\$ -
	Materials	\$ 402,934	\$ -	\$ 402,934	\$ -
	Sub - Total	\$ 1,401,295	\$ -	\$ 1,401,295	\$ -
D/C one side string 2x 477 mcm 240 kV from Lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 32,779,944	\$ -	\$ 32,779,944	\$ -
	Materials	\$ 12,226,808	\$ -	\$ 12,226,808	\$ -
	Sub - Total	\$ 45,006,752	\$ -	\$ 45,006,752	\$ -

D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km			
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km			
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025
	Materials	\$ 529,198	\$ -	\$ 529,198
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223
TOTAL - Transmission Line Project Costs		\$ 161,748,259	\$ -	\$ 161,748,259

\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Substation - NID Estimate

Alt 2a Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
988S Clement Substation				
Circuit Breakers (6x 240kV)	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
PTs (18 x 1Ø 240kV)	\$ 540,000	\$ -	\$ 540,000	\$ -
CTs (6 x 3Ø 240kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
Switch Yard and Substation Control Building	\$ 8,750,000	\$ -	\$ 8,750,000	\$ -
Protection, control, metering	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 15,310,000	\$ -	\$ 15,310,000	\$ -
946 Oakland Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 3,010,000	\$ -	\$ 3,010,000	\$ -
959S Lanfine Substation (New)				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200 Mvar, 144/44 kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 1x144kV, 30 Mvar	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Sub					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
988S Clement Sub					
	Tower/Antenna	\$ 398,700	\$ -	\$ 398,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 725,840	\$ -	\$ 725,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -
Pollock-Cappon 7 GHz					
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 341,800	\$ -	\$ 341,800	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,784,480	\$ -	\$ 2,784,480	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
Telecommunication	\$ 2,133,440	\$ -	\$ 2,133,440	\$ -
Total Facility Costs	\$ 41,289,619	\$ -	\$ 41,289,619	\$ -
Owners Costs	\$ 4,002,287	\$ -	\$ 4,002,287	\$ -
Distributed Costs	\$ 2,546,045	\$ -	\$ 2,546,045	\$ -
Contingency	\$ 6,248,795	\$ -	\$ 6,248,795	\$ -
Total Owners and Dist. Costs	\$ 12,797,127	\$ -	\$ 12,797,127	\$ -
Total Direct Costs	\$ 54,086,746	\$ -	\$ 54,086,746	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,498,940	\$ -	\$ 5,498,940	\$ -
AFUDC	\$ 5,344,969	\$ -	\$ 5,344,969	\$ -
Total Indirect Costs	\$ 25,493,909	\$ -	\$ 25,493,909	\$ -
TOTAL PROJECT COSTS	\$ 79,580,655	\$ -	\$ 79,580,655	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L79)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
Tap 7L25 and build a D/C (7L25 & 7L137) to Rowley	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 4,440,366	\$ -
Tap 7L16 and build a D/C (7L16 & 7L159) to Delburne	3 Km				
	Labour	\$ 438,230	\$ -	\$ 438,230	\$ -
	Materials	\$ 153,819	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 592,049	\$ -
Salvage 7L98 , 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 2a Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar, 144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
New Rowley Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
New Delburne Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -

Sub - Total	\$ 1,140,000	\$ -	\$ 1,140,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
963S Coyote Lake Substation				
Transformer 1 x 240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
TOTAL - Substation Salvage Costs	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S New Delburne Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
802S Michichi Sub					
	Tower/Antenna	\$ 59,100	\$ -	\$ 59,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 264,740	\$ -	\$ 264,740	\$ -
768S New or Expanded Rowley Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
Elnora - Nevis 2 GHz MHSB					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Drum - Wintering 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Wintering - Ander 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
771S Veteran Sub		\$ 74,100			
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,133,440	\$ -	\$ 2,133,440	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 4
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 17,800,000	\$ -	\$ 17,800,000	\$ -
Telecommunication	\$ 310,540	\$ -	\$ 310,540	\$ -
Total Facility Costs	\$ 25,680,267	\$ -	\$ 25,680,267	\$ -
Owners Costs	\$ 2,043,171	\$ -	\$ 2,043,171	\$ -
Distributed Costs	\$ 1,367,254	\$ -	\$ 1,367,254	\$ -
Contingency	\$ 3,484,069	\$ -	\$ 3,484,069	\$ -
Total Owners and Dist. Costs	\$ 6,894,494	\$ -	\$ 6,894,494	\$ -
Total Direct Costs	\$ 32,574,761	\$ -	\$ 32,574,761	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 3,065,981	\$ -	\$ 3,065,981	\$ -
AFUDC	\$ 2,980,133	\$ -	\$ 2,980,133	\$ -
Total Indirect Costs	\$ 11,796,114	\$ -	\$ 11,796,114	\$ -
TOTAL PROJECT COSTS	\$ 44,370,876	\$ -	\$ 44,370,876	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 Km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 Km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 2a Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
2nd Capacitor Bank (1x144kV, 30 Mvar)	\$ 600,000	\$ -	\$ 600,000	
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
932S Pemukan Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 600,000	\$ -	\$ 600,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,540,000	\$ -	\$ 1,540,000	\$ -
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank (1x144kV, 15 Mvar)	\$ 450,000	\$ -	\$ 450,000	
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ -
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ 1
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ -	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ -	\$ -

SCADA	\$ 150,000	\$ -	\$ 150,000
<Misc.>	\$ 150,000	\$ -	\$ 150,000
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000
TOTAL - Substation Project Costs	\$ 17,800,000	\$ -	\$ 17,800,000

\$ -
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Telecommunication NID Estimate

Alt 2a Stage 4		System Portion	Customer Portion	TOTAL
769S Stettler Sub				
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560
	Sub - Total	\$ 310,540	\$ -	\$ 310,540
TOTAL - Telecommunication Project Costs		\$ 310,540	\$ -	\$ 310,540

Capital Maintenance
\$ -
\$ -
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Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 5
(2017). Revised version as per AESO
request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 45,057,330	\$ -	\$ 45,057,330	\$ -
Substation Facilities	\$ 48,990,000	\$ -	\$ 48,990,000	\$ -
Telecommunication	\$ 577,540	\$ -	\$ 577,540	\$ -
Total Facility Costs	\$ 94,624,870	\$ -	\$ 94,624,870	\$ -
Owners Costs	\$ 7,691,108	\$ -	\$ 7,691,108	\$ -
Distributed Costs	\$ 6,721,287	\$ -	\$ 6,721,287	\$ -
Contingency	\$ 10,903,727	\$ -	\$ 10,903,727	\$ -
Total Owners and Dist. Costs	\$ 25,316,122	\$ -	\$ 25,316,122	\$ -
Total Direct Costs	\$ 119,940,992	\$ -	\$ 119,940,992	\$ -
Salvage Costs	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
E&S	\$ 9,851,279	\$ -	\$ 9,851,279	\$ -
AFUDC	\$ 9,575,443	\$ -	\$ 9,575,443	\$ -
Total Indirect Costs	\$ 22,626,723	\$ -	\$ 22,626,723	\$ -
TOTAL PROJECT COSTS	\$ 142,567,714	\$ -	\$ 142,567,714	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$ 2,560,000	\$ -	\$ 2,560,000	\$ -
	Materials	\$ 640,000	\$ -	\$ 640,000	\$ -
	Sub - Total	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
String the open side of the 240kV D/C 2x477 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,200,406	\$ -	\$ 3,200,406	\$ -
	Materials	\$ 1,124,807	\$ -	\$ 1,124,807	\$ -
	Sub - Total	\$ 4,325,213	\$ -	\$ 4,325,213	\$ -

D/C one side string 240kV 2x477 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km			
	Labour	\$ 8,194,986	\$ -	\$ 8,194,986
	Materials	\$ 3,056,702	\$ -	\$ 3,056,702
	Sub - Total	\$ 11,251,688	\$ -	\$ 11,251,688
String the open side if the 240kV D/C from Clement to Pemukan	90 Km			
	Labour	\$ 7,579,908	\$ -	\$ 7,579,908
	Materials	\$ 2,664,016	\$ -	\$ 2,664,016
	Sub - Total	\$ 10,243,924	\$ -	\$ 10,243,924
String the open side if the 240kV D/C from Clement to Oakland	81 Km			
	Labour	\$ 6,821,917	\$ -	\$ 6,821,917
	Materials	\$ 2,397,615	\$ -	\$ 2,397,615
	Sub - Total	\$ 9,219,532	\$ -	\$ 9,219,532
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)	40 Km			
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117
TOTAL - Transmission Line Project Costs		\$ 45,057,330	\$ -	\$ 45,057,330
TOTAL - Transmission Line Salvage Costs		\$3,200,000	\$-	\$3,200,000

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Substation - NID Estimate

Alt 2a Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
946S Oakland Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,460,000	\$ -	\$ 5,460,000	\$ -
959S Lanfine Substation				
Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 800,000	\$ -	\$ 800,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 7,940,000	\$ -	\$ 7,940,000	\$ -
963S Coyote Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (6 x 1Ø 240kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,850,000	\$ -	\$ 5,850,000	\$ -
988S Clement Substation				
Circuit Breakers (3 x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,460,000	\$ -	\$ 5,460,000	\$ -

[illegible]

Telecommunication NID Estimate

Alt 2a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
Misc Telecom Support					
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Area					
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540	\$ -	\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 577,540	\$ -	\$ 577,540	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

**Project: Hanna Area Transmission
Development - Alternative 2a Stage 1
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 72,858,402	\$ -	\$ 72,858,402	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 159,670,062	\$ -	\$ 159,670,062	\$ -
Owners Costs	\$ 12,097,508	\$ -	\$ 12,097,508	\$ -
Distributed Costs	\$ 6,793,450	\$ -	\$ 6,793,450	\$ -
Contingency	\$ 17,856,102	\$ -	\$ 17,856,102	\$ -
Total Owners and Dist. Costs	\$ 36,747,060	\$ -	\$ 36,747,060	\$ -
Total Direct Costs	\$ 196,417,122	\$ -	\$ 196,417,122	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 15,713,370	\$ -	\$ 15,713,370	\$ -
AFUDC	\$ 15,273,395	\$ -	\$ 15,273,395	\$ -
Total Indirect Costs	\$ 30,986,765	\$ -	\$ 30,986,765	\$ -
TOTAL PROJECT COSTS	\$ 227,403,887	\$ -	\$ 227,403,887	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 477 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 28,923,480	\$ -	\$ 28,923,480	\$ -
	Materials	\$ 10,788,360	\$ -	\$ 10,788,360	\$ -
	Sub - Total	\$ 39,711,840	\$ -	\$ 39,711,840	\$ -
D/C 2x 477 mcm 240 kV Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,494,262	\$ -	\$ 3,494,262	\$ -
	Materials	\$ 1,410,269	\$ -	\$ 1,410,269	\$ -
	Sub - Total	\$ 4,904,531	\$ -	\$ 4,904,531	\$ -
D/C 2x 477 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 17,558,214	\$ -	\$ 17,558,214	\$ -
	Materials	\$ 6,832,631	\$ -	\$ 6,832,631	\$ -
	Sub - Total	\$ 24,390,845	\$ -	\$ 24,390,845	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 72,858,402	\$ -	\$ 72,858,402	\$ -

Substation - NID Estimate

Alt 2a Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
946S Oakland Substation (New)				
Circuit Breakers (4x 240kV)	\$ 1,600,000	\$ -	\$ 1,600,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 5,000,000	\$ -	\$ 5,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation					
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation					
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -
Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -

	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200	\$ -
	Sub - Total	\$ 538,900	\$ -	\$ 538,900	\$ -
Fleet-Lonepine 7 GHz Upgrade					
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 348,800	\$ -	\$ 348,800	\$ -
Fleet-Consort 7 GHz Upgrade					
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 379,800	\$ -	\$ 379,800	\$ -
774S Monitor Substation					
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 263,740	\$ -	\$ 263,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 2
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 161,748,259	\$ -	\$ 161,748,259	\$ -
Substation Facilities	\$ 91,360,000	\$ -	\$ 91,360,000	\$ -
Telecommunication	\$ 2,784,480	\$ -	\$ 2,784,480	\$ -
Total Facility Costs	\$ 255,892,739	\$ -	\$ 255,892,739	\$ -
Owners Costs	\$ 20,644,160	\$ -	\$ 20,644,160	\$ -
Distributed Costs	\$ 11,097,159	\$ -	\$ 11,097,159	\$ -
Contingency	\$ 28,763,406	\$ -	\$ 28,763,406	\$ -
Total Owners and Dist. Costs	\$ 60,504,725	\$ -	\$ 60,504,725	\$ -
Total Direct Costs	\$ 316,397,464	\$ -	\$ 316,397,464	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 25,311,797	\$ -	\$ 25,311,797	\$ -
AFUDC	\$ 24,603,067	\$ -	\$ 24,603,067	\$ -
Total Indirect Costs	\$ 49,914,864	\$ -	\$ 49,914,864	\$ -
TOTAL PROJECT COSTS	\$ 366,312,328	\$ -	\$ 366,312,328	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C 2x 477 mcm 240 kV with one side strung from Oakland to Clement (9L06)	81 Km				
	Labour	\$ 37,426,720	\$ -	\$ 37,426,720	\$ -
	Materials	\$ 14,564,292	\$ -	\$ 14,564,292	\$ -
	Sub - Total	\$ 51,991,012	\$ -	\$ 51,991,012	\$ -
D/C 2x 477 mcm 240 kV with one side strung from Clement to Pemukan (9L14)	90 Km				
	Labour	\$ 41,585,244	\$ -	\$ 41,585,244	\$ -
	Materials	\$ 16,182,547	\$ -	\$ 16,182,547	\$ -
	Sub - Total	\$ 57,767,791	\$ -	\$ 57,767,791	\$ -
D/C 2x 477 mcm 240 kV from Clement and tap into 9L59 (9L59 & 9L63)	2 Km				
	Labour	\$ 998,361	\$ -	\$ 998,361	\$ -
	Materials	\$ 402,934	\$ -	\$ 402,934	\$ -
	Sub - Total	\$ 1,401,295	\$ -	\$ 1,401,295	\$ -
D/C one side string 2x 477 mcm 240 kV from Lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 32,779,944	\$ -	\$ 32,779,944	\$ -
	Materials	\$ 12,226,808	\$ -	\$ 12,226,808	\$ -
	Sub - Total	\$ 45,006,752	\$ -	\$ 45,006,752	\$ -

D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km			
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km			
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025
	Materials	\$ 529,198	\$ -	\$ 529,198
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223
TOTAL - Transmission Line Project Costs		\$ 161,748,259	\$ -	\$ 161,748,259

\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Substation - NID Estimate

Alt 2a Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
988S Clement Substation				
Circuit Breakers (6x 240kV)	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
PTs (18 x 1Ø 240kV)	\$ 540,000	\$ -	\$ 540,000	\$ -
CTs (6 x 3Ø 240kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
Switch Yard and Substation Control Building	\$ 8,750,000	\$ -	\$ 8,750,000	\$ -
Protection, control, metering	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 15,310,000	\$ -	\$ 15,310,000	\$ -
946 Oakland Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 3,010,000	\$ -	\$ 3,010,000	\$ -
959S Lanfine Substation (New)				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200 Mvar, 144/44 kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 1x144kV, 30 Mvar	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -

CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
910S Excel Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
932S Pemukan Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 1,500,000	\$ -	\$ 1,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 150,000	\$ -	\$ 150,000	\$ -
Sub - Total	\$ 4,310,000	\$ -	\$ 4,310,000	\$ -
TOTAL - Substation Project Costs	\$ 91,360,000	\$ -	\$ 91,360,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Sub					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
988S Clement Sub					
	Tower/Antenna	\$ 398,700	\$ -	\$ 398,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 725,840	\$ -	\$ 725,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -
Pollock-Cappon 7 GHz					
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 341,800	\$ -	\$ 341,800	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,784,480	\$ -	\$ 2,784,480	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

**Project: Hanna Area Transmission
Development - Alternative 2a Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
Telecommunication	\$ 2,133,440	\$ -	\$ 2,133,440	\$ -
Total Facility Costs	\$ 41,289,619	\$ -	\$ 41,289,619	\$ -
Owners Costs	\$ 4,002,287	\$ -	\$ 4,002,287	\$ -
Distributed Costs	\$ 2,546,045	\$ -	\$ 2,546,045	\$ -
Contingency	\$ 6,248,795	\$ -	\$ 6,248,795	\$ -
Total Owners and Dist. Costs	\$ 12,797,127	\$ -	\$ 12,797,127	\$ -
Total Direct Costs	\$ 54,086,746	\$ -	\$ 54,086,746	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,498,940	\$ -	\$ 5,498,940	\$ -
AFUDC	\$ 5,344,969	\$ -	\$ 5,344,969	\$ -
Total Indirect Costs	\$ 25,493,909	\$ -	\$ 25,493,909	\$ -
TOTAL PROJECT COSTS	\$ 79,580,655	\$ -	\$ 79,580,655	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L79)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
Tap 7L25 and build a D/C (7L25 & 7L137) to Rowley	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 4,440,366	\$ -
Tap 7L16 and build a D/C (7L16 & 7L159) to Delburne	3 Km				
	Labour	\$ 438,230	\$ -	\$ 438,230	\$ -
	Materials	\$ 153,819	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 592,049	\$ -
Salvage 7L98 , 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 2a Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar, 144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
New Rowley Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
New Delburne Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -

Sub - Total	\$ 1,140,000	\$ -	\$ 1,140,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
963S Coyote Lake Substation				
Transformer 1 x 240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
TOTAL - Substation Salvage Costs	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

	Alt 2a Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S New Delburne Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
802S Michichi Sub					
	Tower/Antenna	\$ 59,100	\$ -	\$ 59,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 264,740	\$ -	\$ 264,740	\$ -
768S New or Expanded Rowley Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
Elnora - Nevis 2 GHz MHSB					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Drum - Wintering 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Wintering - Ander 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
771S Veteran Sub		\$ 74,100			
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,133,440	\$ -	\$ 2,133,440	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 4
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 17,800,000	\$ -	\$ 17,800,000	\$ -
Telecommunication	\$ 310,540	\$ -	\$ 310,540	\$ -
Total Facility Costs	\$ 25,680,267	\$ -	\$ 25,680,267	\$ -
Owners Costs	\$ 2,043,171	\$ -	\$ 2,043,171	\$ -
Distributed Costs	\$ 1,367,254	\$ -	\$ 1,367,254	\$ -
Contingency	\$ 3,484,069	\$ -	\$ 3,484,069	\$ -
Total Owners and Dist. Costs	\$ 6,894,494	\$ -	\$ 6,894,494	\$ -
Total Direct Costs	\$ 32,574,761	\$ -	\$ 32,574,761	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 3,065,981	\$ -	\$ 3,065,981	\$ -
AFUDC	\$ 2,980,133	\$ -	\$ 2,980,133	\$ -
Total Indirect Costs	\$ 11,796,114	\$ -	\$ 11,796,114	\$ -
TOTAL PROJECT COSTS	\$ 44,370,876	\$ -	\$ 44,370,876	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 Km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 Km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 2a Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
2nd Capacitor Bank (1x144kV, 30 Mvar)	\$ 600,000	\$ -	\$ 600,000	
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
932S Pemukan Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 600,000	\$ -	\$ 600,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,540,000	\$ -	\$ 1,540,000	\$ -
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank (1x144kV, 15 Mvar)	\$ 450,000	\$ -	\$ 450,000	
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ -
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ 1
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ -	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ -	\$ -

SCADA	\$ 150,000	\$ -	\$ 150,000
<Misc.>	\$ 150,000	\$ -	\$ 150,000
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000
TOTAL - Substation Project Costs	\$ 17,800,000	\$ -	\$ 17,800,000

\$ -
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Telecommunication NID Estimate

Alt 2a Stage 4		System Portion	Customer Portion	TOTAL
769S Stettler Sub				
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560
	Sub - Total	\$ 310,540	\$ -	\$ 310,540
TOTAL - Telecommunication Project Costs		\$ 310,540	\$ -	\$ 310,540

Capital Maintenance
\$ -
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Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2a Stage 5
(2017). Revised version as per AESO
request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 45,057,330	\$ -	\$ 45,057,330	\$ -
Substation Facilities	\$ 48,990,000	\$ -	\$ 48,990,000	\$ -
Telecommunication	\$ 577,540	\$ -	\$ 577,540	\$ -
Total Facility Costs	\$ 94,624,870	\$ -	\$ 94,624,870	\$ -
Owners Costs	\$ 7,691,108	\$ -	\$ 7,691,108	\$ -
Distributed Costs	\$ 6,721,287	\$ -	\$ 6,721,287	\$ -
Contingency	\$ 10,903,727	\$ -	\$ 10,903,727	\$ -
Total Owners and Dist. Costs	\$ 25,316,122	\$ -	\$ 25,316,122	\$ -
Total Direct Costs	\$ 119,940,992	\$ -	\$ 119,940,992	\$ -
Salvage Costs	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
E&S	\$ 9,851,279	\$ -	\$ 9,851,279	\$ -
AFUDC	\$ 9,575,443	\$ -	\$ 9,575,443	\$ -
Total Indirect Costs	\$ 22,626,723	\$ -	\$ 22,626,723	\$ -
TOTAL PROJECT COSTS	\$ 142,567,714	\$ -	\$ 142,567,714	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$ 2,560,000	\$ -	\$ 2,560,000	\$ -
	Materials	\$ 640,000	\$ -	\$ 640,000	\$ -
	Sub - Total	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
String the open side of the 240kV D/C 2x477 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,200,406	\$ -	\$ 3,200,406	\$ -
	Materials	\$ 1,124,807	\$ -	\$ 1,124,807	\$ -
	Sub - Total	\$ 4,325,213	\$ -	\$ 4,325,213	\$ -

D/C one side string 240kV 2x477 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km			
	Labour	\$ 8,194,986	\$ -	\$ 8,194,986
	Materials	\$ 3,056,702	\$ -	\$ 3,056,702
	Sub - Total	\$ 11,251,688	\$ -	\$ 11,251,688
String the open side if the 240kV D/C from Clement to Pemukan	90 Km			
	Labour	\$ 7,579,908	\$ -	\$ 7,579,908
	Materials	\$ 2,664,016	\$ -	\$ 2,664,016
	Sub - Total	\$ 10,243,924	\$ -	\$ 10,243,924
String the open side if the 240kV D/C from Clement to Oakland	81 Km			
	Labour	\$ 6,821,917	\$ -	\$ 6,821,917
	Materials	\$ 2,397,615	\$ -	\$ 2,397,615
	Sub - Total	\$ 9,219,532	\$ -	\$ 9,219,532
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)	40 Km			
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117
TOTAL - Transmission Line Project Costs		\$ 45,057,330	\$ -	\$ 45,057,330
TOTAL - Transmission Line Salvage Costs		\$3,200,000	\$-	\$3,200,000

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Substation - NID Estimate

Alt 2a Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
946S Oakland Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,460,000	\$ -	\$ 5,460,000	\$ -
959S Lanfine Substation				
Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 800,000	\$ -	\$ 800,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 7,940,000	\$ -	\$ 7,940,000	\$ -
963S Coyote Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (6 x 1Ø 240kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,850,000	\$ -	\$ 5,850,000	\$ -
988S Clement Substation				
Circuit Breakers (3 x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,460,000	\$ -	\$ 5,460,000	\$ -

Telecommunication NID Estimate

Alt 2a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
Misc Telecom Support					
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Area					
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540	\$ -	\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 577,540	\$ -	\$ 577,540	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2b Stage 1
(Dec-2012). Revised version as
perAESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 80,522,881	\$ -	\$ 80,522,881	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 167,334,541	\$ -	\$ 167,334,541	\$ -
Owners Costs	\$ 12,745,438	\$ -	\$ 12,745,438	\$ -
Distributed Costs	\$ 7,179,222	\$ -	\$ 7,179,222	\$ -
Contingency	\$ 18,725,920	\$ -	\$ 18,725,920	\$ -
Total Owners and Dist. Costs	\$ 38,650,580	\$ -	\$ 38,650,580	\$ -
Total Direct Costs	\$ 205,985,121	\$ -	\$ 205,985,121	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 16,478,810	\$ -	\$ 16,478,810	\$ -
AFUDC	\$ 16,017,403	\$ -	\$ 16,017,403	\$ -
Total Indirect Costs	\$ 32,496,213	\$ -	\$ 32,496,213	\$ -
TOTAL PROJECT COSTS	\$ 238,481,334	\$ -	\$ 238,481,334	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2b Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 795 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 31,608,180	\$ -	\$ 31,608,180	\$ -
	Materials	\$ 12,357,180	\$ -	\$ 12,357,180	\$ -
	Sub - Total	\$ 43,965,360	\$ -	\$ 43,965,360	\$ -
D/C 2x 795 mcm 240 kV Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,937,400	\$ -	\$ 3,937,400	\$ -
	Materials	\$ 1,684,228	\$ -	\$ 1,684,228	\$ -
	Sub - Total	\$ 5,621,628	\$ -	\$ 5,621,628	\$ -
D/C 2x 795 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 19,258,501	\$ -	\$ 19,258,501	\$ -
	Materials	\$ 7,826,206	\$ -	\$ 7,826,206	\$ -
	Sub - Total	\$ 27,084,707	\$ -	\$ 27,084,707	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 80,522,881	\$ -	\$ 80,522,881	\$ -

Substation - NID Estimate

Alt 2b Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -

Circuit Breakers (2 x 144kV)	\$ 360,000	\$ -	\$ 360,000
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 60,000
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 8,750,000	\$ -	\$ 8,750,000
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000
SCADA	\$ 250,000	\$ -	\$ 250,000
<Misc.>	\$ 250,000	\$ -	\$ 250,000
Sub - Total	\$ 60,940,000	\$ -	\$ 60,940,000

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TOTAL - Substation Project Costs	\$ 82,890,000	\$ -	\$ 82,890,000

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Telecommunication NID Estimate

	Alt 2b Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation					
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation					
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -
Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -

	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200
	Sub - Total	\$ 538,900	\$ -	\$ 538,900
Fleet-Lonepine 7 GHz Upgrade				
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800
	Sub - Total	\$ 348,800	\$ -	\$ 348,800
Fleet-Consort 7 GHz Upgrade				
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800
	Sub - Total	\$ 379,800	\$ -	\$ 379,800
774S Monitor Substation				
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560
	Sub - Total	\$ 263,740	\$ -	\$ 263,740
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660

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Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2b Stage 2
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 174,210,538	\$ -	\$ 174,210,538	\$ -
Substation Facilities	\$ 91,360,000	\$ -	\$ 91,360,000	\$ -
Telecommunication	\$ 2,784,480	\$ -	\$ 2,784,480	\$ -
Total Facility Costs	\$ 268,355,018	\$ -	\$ 268,355,018	\$ -
Owners Costs	\$ 21,640,319	\$ -	\$ 21,640,319	\$ -
Distributed Costs	\$ 11,634,006	\$ -	\$ 11,634,006	\$ -
Contingency	\$ 30,162,934	\$ -	\$ 30,162,934	\$ -
Total Owners and Dist. Costs	\$ 63,437,259	\$ -	\$ 63,437,259	\$ -
Total Direct Costs	\$ 331,792,277	\$ -	\$ 331,792,277	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 26,543,382	\$ -	\$ 26,543,382	\$ -
AFUDC	\$ 25,800,167	\$ -	\$ 25,800,167	\$ -
Total Indirect Costs	\$ 52,343,550	\$ -	\$ 52,343,550	\$ -
TOTAL PROJECT COSTS	\$ 384,135,827	\$ -	\$ 384,135,827	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2b Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C 2x 795 mcm 240 kV with one side strung from Oakland to Clement (9L06)	81 Km				
	Labour	\$ 41,226,300	\$ -	\$ 41,226,300	\$ -
	Materials	\$ 14,287,378	\$ -	\$ 14,287,378	\$ -
	Sub - Total	\$ 55,513,678	\$ -	\$ 55,513,678	\$ -
D/C 2x 795 mcm 240 kV with one side strung from Clement to Pemukan (9L14)	90 Km				
	Labour	\$ 45,807,000	\$ -	\$ 45,807,000	\$ -
	Materials	\$ 15,874,864	\$ -	\$ 15,874,864	\$ -
	Sub - Total	\$ 61,681,864	\$ -	\$ 61,681,864	\$ -
D/C 2x 795 mcm 240 kV from Clement and tap into 9L59 (9L59 & 9L63)	2 Km				
	Labour	\$ 1,124,971	\$ -	\$ 1,124,971	\$ -
	Materials	\$ 481,208	\$ -	\$ 481,208	\$ -
	Sub - Total	\$ 1,606,179	\$ -	\$ 1,606,179	\$ -
D/C one side string 2x 795 mcm 240 kV from Lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 35,822,604	\$ -	\$ 35,822,604	\$ -
	Materials	\$ 14,004,804	\$ -	\$ 14,004,804	\$ -
	Sub - Total	\$ 49,827,408	\$ -	\$ 49,827,408	\$ -

D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km			
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km			
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025
	Materials	\$ 529,198	\$ -	\$ 529,198
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223
TOTAL - Transmission Line Project Costs		\$ 174,210,538	\$ -	\$ 174,210,538

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Substation - NID Estimate

Alt 2b Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
988S Clement Substation				
Circuit Breakers (6x 240kV)	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
PTs (18 x 1Ø 240kV)	\$ 540,000	\$ -	\$ 540,000	\$ -
CTs (6 x 3Ø 240kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
Switch Yard and Substation Control Building	\$ 8,750,000	\$ -	\$ 8,750,000	\$ -
Protection, control, metering	\$ 2,400,000	\$ -	\$ 2,400,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 15,310,000	\$ -	\$ 15,310,000	\$ -
946 Oakland Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 3,010,000	\$ -	\$ 3,010,000	\$ -
959S Lanfine Substation (New)				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200 Mvar, 144/44kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 1x144kV, 30 Mvar (1st)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -

<Misc.>	\$ 50,000	\$ -	\$ 50,000
Sub - Total	\$ 760,000	\$ -	\$ 760,000
910S Excel Substation			
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000
SCADA	\$ 20,000	\$ -	\$ 20,000
<Misc.>	\$ 50,000	\$ -	\$ 50,000
Sub - Total	\$ 760,000	\$ -	\$ 760,000
932S Pemukan Substation			
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000
Switch Yard and Substation Control Building	\$ 1,500,000	\$ -	\$ 1,500,000
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000
SCADA	\$ 50,000	\$ -	\$ 50,000
<Misc.>	\$ 150,000	\$ -	\$ 150,000
Sub - Total	\$ 4,310,000	\$ -	\$ 4,310,000
TOTAL - Substation Project Costs	\$ 91,360,000	\$ -	\$ 91,360,000

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Telecommunication NID Estimate

Alt 2b Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
988S Clement Substation					
	Tower/Antenna	\$ 398,700	\$ -	\$ 398,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 725,840	\$ -	\$ 725,840	\$ -
959S Lanfine Sub					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -
Pollock-Cappon 7 GHz					
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -

	Sub - Total	\$ 341,800	\$ -	\$ 341,800
TOTAL - Telecommunication Project Costs		\$ 2,784,480	\$ -	\$ 2,784,480

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Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

**Project: Hanna Area Transmission
Development - Alternative 2b Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
Telecommunication	\$ 2,133,440	\$ -	\$ 2,133,440	\$ -
Total Facility Costs	\$ 41,289,619	\$ -	\$ 41,289,619	\$ -
Owners Costs	\$ 4,002,287	\$ -	\$ 4,002,287	\$ -
Distributed Costs	\$ 2,546,045	\$ -	\$ 2,546,045	\$ -
Contingency	\$ 6,248,795	\$ -	\$ 6,248,795	\$ -
Total Owners and Dist. Costs	\$ 12,797,127	\$ -	\$ 12,797,127	\$ -
Total Direct Costs	\$ 54,086,746	\$ -	\$ 54,086,746	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,498,940	\$ -	\$ 5,498,940	\$ -
AFUDC	\$ 5,344,969	\$ -	\$ 5,344,969	\$ -
Total Indirect Costs	\$ 25,493,909	\$ -	\$ 25,493,909	\$ -
TOTAL PROJECT COSTS	\$ 79,580,655	\$ -	\$ 79,580,655	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2b Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L79)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
Tap 7L25 and build a D/C (7L25 & 7L137) to Rowley	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 4,440,366	\$ -
Tap 7L16 and build a D/C (7L16 & 7L159) to Delburne	3 Km				
	Labour	\$ 438,230	\$ -	\$ 438,230	\$ -
	Materials	\$ 153,819	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 592,049	\$ -
Salvage 7L98 , 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 2b Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar, 144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
New Rowley Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
New Delburne Substation				
Transformer 1 x 144/25kV, 25 MVA	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Brakers (2x144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,140,000	\$ -	\$ 1,140,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
963S Coyote Lake Substation				
Transformer 1 x 240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -

PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 23,930,000	\$ -	\$ 23,930,000	\$ -
TOTAL - Substation Salvage Costs	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

Alt 2b Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S Delburne Sub (New)					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
802S Michichi Sub					
	Tower/Antenna	\$ 59,100	\$ -	\$ 59,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 264,740	\$ -	\$ 264,740	\$ -
768S Rowley Sub (New or Expanded)					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

Elnora - Nevis 2 GHz MHSB	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
Drum - Wintering 2 GHz	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
Wintering - Ander 2 GHz	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
771S Veteran Sub	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,133,440	\$ -	\$ 2,133,440	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2b Stage 4
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 17,800,000	\$ -	\$ 17,800,000	\$ -
Telecommunication	\$ 310,540	\$ -	\$ 310,540	\$ -
Total Facility Costs	\$ 25,680,267	\$ -	\$ 25,680,267	\$ -
Owners Costs	\$ 2,043,171	\$ -	\$ 2,043,171	\$ -
Distributed Costs	\$ 1,367,254	\$ -	\$ 1,367,254	\$ -
Contingency	\$ 3,484,069	\$ -	\$ 3,484,069	\$ -
Total Owners and Dist. Costs	\$ 6,894,494	\$ -	\$ 6,894,494	\$ -
Total Direct Costs	\$ 32,574,761	\$ -	\$ 32,574,761	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 3,065,981	\$ -	\$ 3,065,981	\$ -
AFUDC	\$ 2,980,133	\$ -	\$ 2,980,133	\$ -
Total Indirect Costs	\$ 11,796,114	\$ -	\$ 11,796,114	\$ -
TOTAL PROJECT COSTS	\$ 44,370,876	\$ -	\$ 44,370,876	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2b Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 Km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 Km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 2 Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
Capacitor Bank 1x144kV, 30 Mvar (2nd)	\$ 600,000		\$ 600,000	
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
932S Pemukan Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 600,000	\$ -	\$ 600,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,540,000	\$ -	\$ 1,540,000	\$ -
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	\$ 1
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank 1x144kV, 15 Mvar	\$ 450,000	\$ -	\$ 450,000	\$ 1
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ 2
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ 1
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -

SCADA	\$ 150,000	\$ -	\$ 150,000
<Misc.>	\$ 150,000	\$ -	\$ 150,000
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000
TOTAL - Substation Project Costs	\$ 17,800,000	\$ -	\$ 17,800,000

\$ -
\$ -
\$ -
\$ -

Telecommunication NID Estimate

Alt 2 Stage 4		System Portion	Customer Portion	TOTAL
769S Stettler Sub				
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900
	Fiber (km)	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080
	Building (If substation building not utilized)	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560
	Sub - Total	\$ 310,540	\$ -	\$ 310,540
TOTAL - Telecommunication Project Costs		\$ 310,540	\$ -	\$ 310,540

Capital Maintenance
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 2b Stage 5
(2017). Revise version as per AESO
request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 52,856,729	\$ -	\$ 52,856,729	\$ -
Substation Facilities	\$ 48,990,000	\$ -	\$ 48,990,000	\$ -
Telecommunication	\$ 577,540	\$ -	\$ 577,540	\$ -
Total Facility Costs	\$ 102,424,269	\$ -	\$ 102,424,269	\$ -
Owners Costs	\$ 8,312,171	\$ -	\$ 8,312,171	\$ -
Distributed Costs	\$ 7,267,928	\$ -	\$ 7,267,928	\$ -
Contingency	\$ 11,800,437	\$ -	\$ 11,800,437	\$ -
Total Owners and Dist. Costs	\$ 27,380,536	\$ -	\$ 27,380,536	\$ -
Total Direct Costs	\$ 129,804,805	\$ -	\$ 129,804,805	\$ -
Salvage Costs	\$3,200,000	\$ -	\$3,200,000	\$ -
E&S	\$ 10,640,384	\$ -	\$ 10,640,384	\$ -
AFUDC	\$ 10,342,454	\$ -	\$ 10,342,454	\$ -
Total Indirect Costs	\$24,182,838	\$ -	\$24,182,838	\$ -
TOTAL PROJECT COSTS	\$153,987,643	\$ -	\$153,987,643	\$ -

This Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 2bStage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 240kV D/C 2x795 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,905,724	\$ -	\$ 3,905,724	\$ -
	Materials	\$ 1,618,441	\$ -	\$ 1,618,441	\$ -
	Sub - Total	\$ 5,524,165	\$ -	\$ 5,524,165	\$ -
D/C one side string 240kV 2x795 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km				
	Labour	\$ 8,955,651	\$ -	\$ 8,955,651	\$ -
	Materials	\$ 3,501,201	\$ -	\$ 3,501,201	\$ -
	Sub - Total	\$ 12,456,852	\$ -	\$ 12,456,852	\$ -
String the open side of the 240kV D/C 2x795 mcm from Oakland to Clement (9L52)	81Km				
	Labour	\$ 8,325,358	\$ -	\$ 8,325,358	\$ -
	Materials	\$ 3,449,834	\$ -	\$ 3,449,834	\$ -
	Sub - Total	\$ 11,775,192	\$ -	\$ 11,775,192	\$ -
String the open side of the 240kV D/C 2x795 mcm from Pemukan to Clement(9L25)	90 Km				
	Labour	\$ 9,250,398	\$ -	\$ 9,250,398	\$ -
	Materials	\$ 3,833,149	\$ -	\$ 3,833,149	\$ -
	Sub - Total	\$ 13,083,547	\$ -	\$ 13,083,547	\$ -

String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$505,327	\$-	\$505,327	\$-
	Materials	\$177,601	\$-	\$177,601	\$-
	Sub - Total	\$682,928	\$-	\$682,928	\$-
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$505,327	\$-	\$505,327	\$-
	Materials	\$177,601	\$-	\$177,601	\$-
	Sub - Total	\$682,928	\$-	\$682,928	\$-
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$2,560,000	\$-	\$2,560,000	\$-
	Materials	\$640,000	\$-	\$640,000	\$-
	Sub - Total	\$3,200,000	\$-	\$3,200,000	\$-
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)	40 Km				
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126	\$ -
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991	\$ -
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117	\$ -
TOTAL - Transmission Line Project Costs		\$ 52,856,729	\$ -	\$ 52,856,729	\$ -
TOTAL - Transmission Line Salvage Costs		\$3,200,000	\$ -	\$3,200,000	\$ -

Substation - NID Estimate

Alt 2b Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
946S Oakland Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (9 x 1Ø 240kV)	\$ 270,000	\$ -	\$ 270,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 5,460,000	\$ -	\$ 5,460,000	\$ -
959S Lanfine Substation				
Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 800,000	\$ -	\$ 800,000	\$ -
Protection, control, metering	\$ 500,000	\$ -	\$ 500,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 7,940,000	\$ -	\$ 7,940,000	\$ -
755S Cordel Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,750,000	\$ -	\$ 1,750,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 2,760,000	\$ -	\$ 2,760,000	\$ -
401S Halkirk Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 1,750,000	\$ -	\$ 1,750,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 2,760,000	\$ -	\$ 2,760,000	\$ -
963S Coyote Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (6 x 1Ø 240kV)	\$ 180,000	\$ -	\$ 180,000	\$ -

[illegible]

Telecommunication NID Estimate

Alt 2b Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
Misc Telecom Support					
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Area					
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540	\$ -	\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 577,540	\$ -	\$ 577,540	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3a Stage 1
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 72,858,402	\$ -	\$ 72,858,402	\$ -
Substation Facilities	\$ 82,890,000	\$ -	\$ 82,890,000	\$ -
Telecommunication	\$ 3,921,660	\$ -	\$ 3,921,660	\$ -
Total Facility Costs	\$ 159,670,062	\$ -	\$ 159,670,062	\$ -
Owners Costs	\$ 14,446,184	\$ -	\$ 14,446,184	\$ -
Distributed Costs	\$ 11,275,448	\$ -	\$ 11,275,448	\$ -
Contingency	\$ 18,539,169	\$ -	\$ 18,539,169	\$ -
Total Owners and Dist. Costs	\$ 44,260,801	\$ -	\$ 44,260,801	\$ -
Total Direct Costs	\$ 203,930,863	\$ -	\$ 203,930,863	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 16,314,469	\$ -	\$ 16,314,469	\$ -
AFUDC	\$ 15,857,664	\$ -	\$ 15,857,664	\$ -
Total Indirect Costs	\$ 32,172,133	\$ -	\$ 32,172,133	\$ -
TOTAL PROJECT COSTS	\$ 236,102,996	\$ -	\$ 236,102,996	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C one side string 2x 477 mcm 240 kV Pemukan to Hansman Lake (9L966)	60 Km				
	Labour	\$ 28,923,480	\$ -	\$ 28,923,480	\$ -
	Materials	\$ 10,788,360	\$ -	\$ 10,788,360	\$ -
	Sub - Total	\$ 39,711,840	\$ -	\$ 39,711,840	\$ -
D/C 2x 477 mcm 240kV Oakland to Anderson (9L70 & 9L97)	7 Km				
	Labour	\$ 3,494,262	\$ -	\$ 3,494,262	\$ -
	Materials	\$ 1,410,269	\$ -	\$ 1,410,269	\$ -
	Sub - Total	\$ 4,904,531	\$ -	\$ 4,904,531	\$ -
D/C 2x 477 mcm 240 kV with one side strung Oakland to Coyote (9L29)	38 Km				
	Labour	\$ 17,558,214	\$ -	\$ 17,558,214	\$ -
	Materials	\$ 6,832,631	\$ -	\$ 6,832,631	\$ -
	Sub - Total	\$ 24,390,845	\$ -	\$ 24,390,845	\$ -
D/C 2x 477 mcm 144 kV with one side strung Pemukan to Monitor (7L127)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 72,858,402	\$ -	\$ 72,858,402	\$ -

Substation - NID Estimate

Alt 3a Stage 1	System Portion	Customer Portion	TOTAL	Capital Maintenance
757S Battle River Substation				
1 x 72kV, 10 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
769S Stettler Substation				
1 x 144kV, 15 MVAR Cap Bank	\$ 400,000	\$ -	\$ 400,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,490,000	\$ -	\$ 1,490,000	\$ -
770S Three Hills Substation				
1 x 144kV, 20 MVAR Cap Bank	\$ 500,000	\$ -	\$ 500,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,590,000	\$ -	\$ 1,590,000	\$ -
772S Youngstown Substation				
1 x 72kV, 5 MVAR Cap Bank	\$ 250,000	\$ -	\$ 250,000	\$ -
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 150,000	\$ -	\$ 150,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,220,000	\$ -	\$ 1,220,000	\$ -
946S Oakland Substation				
Circuit Breakers (4x 240kV)	\$ 1,600,000	\$ -	\$ 1,600,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 5,000,000	\$ -	\$ 5,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -

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Telecommunication NID Estimate

Alt 3a Stage 1		System Portion	Customer Portion	TOTAL	Capital Maintenance
963S Coyote Lake Sub					
	Tower/Antenna	\$ 278,700	\$ -	\$ 278,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 605,840	\$ -	\$ 605,840	\$ -
946S Oakland Substation					
	Tower/Antenna	\$ 304,200	\$ -	\$ 304,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 631,340	\$ -	\$ 631,340	\$ -
932S Pemukan Substation					
	Tower/Antenna	\$ 177,950	\$ -	\$ 177,950	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 505,090	\$ -	\$ 505,090	\$ -
Fleet Tower Rebuild					
	Tower/Antenna	\$ 623,700	\$ -	\$ 623,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 24,450	\$ -	\$ 24,450	\$ -
	Sub - Total	\$ 648,150	\$ -	\$ 648,150	\$ -
Pollockville Tower Rebuild					
	Tower/Antenna	\$ 513,700	\$ -	\$ 513,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -

	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 25,200	\$ -	\$ 25,200	\$ -
	Sub - Total	\$ 538,900	\$ -	\$ 538,900	\$ -
Fleet- Lonepine 7 GHz Upgrade					
	Tower/Antenna	\$ 145,000	\$ -	\$ 145,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 348,800	\$ -	\$ 348,800	\$ -
Fleet- Consort 7 GHz Upgrade					
	Tower/Antenna	\$ 176,000	\$ -	\$ 176,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 379,800	\$ -	\$ 379,800	\$ -
774S Monitor Substation					
	Tower/Antenna	\$ 64,100	\$ -	\$ 64,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 263,740	\$ -	\$ 263,740	\$ -
TOTAL - Telecommunication Project Costs		\$ 3,921,660	\$ -	\$ 3,921,660	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3a Stage 2
(Dec-2012) Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 106,430,359	\$ -	\$ 106,430,359	\$ -
Substation Facilities	\$ 71,450,000	\$ -	\$ 71,450,000	\$ -
Telecommunication	\$ 2,332,380	\$ -	\$ 2,332,380	\$ -
Total Facility Costs	\$ 180,212,739	\$ -	\$ 180,212,739	\$ -
Owners Costs	\$ 13,658,454	\$ -	\$ 13,658,454	\$ -
Distributed Costs	\$ 8,686,777	\$ -	\$ 8,686,777	\$ -
Contingency	\$ 20,255,797	\$ -	\$ 20,255,797	\$ -
Total Owners and Dist. Costs	\$ 42,601,028	\$ -	\$ 42,601,028	\$ -
Total Direct Costs	\$ 222,813,767	\$ -	\$ 222,813,767	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
E&S	\$ 17,825,101	\$ -	\$ 17,825,101	\$ -
AFUDC	\$ 17,325,999	\$ -	\$ 17,325,999	\$ -
Total Indirect Costs	\$ 35,151,100	\$ -	\$ 35,151,100	\$ -
TOTAL PROJECT COSTS	\$ 257,964,867	\$ -	\$ 257,964,867	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
D/C 2x 477 mcm 240 kV with one side strung from Lanfine to Oakland (9L24)	87 Km				
	Labour	\$ 40,199,070	\$ -	\$ 40,199,070	\$ -
	Materials	\$ 15,643,128	\$ -	\$ 15,643,128	\$ -
	Sub - Total	\$ 55,842,198	\$ -	\$ 55,842,198	\$ -
D/C 2x 477 mcm 240kV from lanfine to Pemukan (9L46)	68 Km				
	Labour	\$ 32,779,944	\$ -	\$ 32,779,944	\$ -
	Materials	\$ 12,226,808	\$ -	\$ 12,226,808	\$ -
	Sub - Total	\$ 45,006,752	\$ -	\$ 45,006,752	\$ -
S/C 477 mcm 144 kV from Lanfine to Excel (7L116)	8 Km				
	Labour	\$ 1,201,025	\$ -	\$ 1,201,025	\$ -
	Materials	\$ 529,198	\$ -	\$ 529,198	\$ -
	Sub - Total	\$ 1,730,223	\$ -	\$ 1,730,223	\$ -
D/C 2x 477 mcm 144 kV with one side strung Lanfine to Oyen (7L132)	6 Km				
	Labour	\$ 2,772,350	\$ -	\$ 2,772,350	\$ -
	Materials	\$ 1,078,836	\$ -	\$ 1,078,836	\$ -
	Sub - Total	\$ 3,851,186	\$ -	\$ 3,851,186	\$ -
TOTAL - Transmission Line Project Costs		\$ 106,430,359	\$ -	\$ 106,430,359	\$ -

Substation - NID Estimate

Alt 3a Stage 2	System Portion	Customer Portion	TOTAL	Capital Maintenance
959S Lanfine Substation				
Transformer 1x240/144kV, 180/240/300 MVA	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Static Var Compensator (+/- 200Mvar, 144/44 kV)	\$ 43,000,000	\$ -	\$ 43,000,000	\$ -
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (12 x 1Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
CTs (2 x 3Ø 240kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
Capacitor Bank 30 Mvar, 144kV	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (12 x 1Ø 144kV)	\$ 240,000	\$ -	\$ 240,000	\$ -
CTs (3 x 3Ø 144kV)	\$ 150,000	\$ -	\$ 150,000	\$ -
Switch Yard and Substation Control Building	\$ 11,250,000	\$ -	\$ 11,250,000	\$ -
Protection, control, metering	\$ 2,700,000	\$ -	\$ 2,700,000	\$ -
SCADA	\$ 250,000	\$ -	\$ 250,000	\$ -
<Misc.>	\$ 500,000	\$ -	\$ 500,000	\$ -
Sub - Total	\$ 67,210,000	\$ -	\$ 67,210,000	\$ -
932S Pemukan Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000	\$ -
946S Oakland Substation				
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Switch Yard and Substation Control Building	\$ 400,000	\$ -	\$ 400,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,360,000	\$ -	\$ 1,360,000	\$ -
767S Oyen Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
910S Excel Substation				
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000	\$ -
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000	\$ -
<Misc.>	\$ 50,000	\$ -	\$ 50,000	\$ -
Sub - Total	\$ 760,000	\$ -	\$ 760,000	\$ -
TOTAL - Substation Project Costs	\$ 71,450,000	\$ -	\$ 71,450,000	\$ -

Telecommunication NID Estimate

Alt 3a Stage 2		System Portion	Customer Portion	TOTAL	Capital Maintenance
771S Veteran Sub					
	Tower/Antenna	\$ 74,100	\$ -	\$ 74,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 273,740	\$ -	\$ 273,740	\$ -
959S Lanfine Substation					
	Tower/Antenna	\$ 383,700	\$ -	\$ 383,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 267,180	\$ -	\$ 267,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 59,960	\$ -	\$ 59,960	\$ -
	Sub - Total	\$ 710,840	\$ -	\$ 710,840	\$ -
Sedelia Telecom Tower					
	Tower/Antenna	\$ 508,200	\$ -	\$ 508,200	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 44,000	\$ -	\$ 44,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 28,460	\$ -	\$ 28,460	\$ -
	Sub - Total	\$ 580,660	\$ -	\$ 580,660	\$ -
Sedelia Telecom					
	Tower/Antenna	\$ 90,500	\$ -	\$ 90,500	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 268,180	\$ -	\$ 268,180	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 66,660	\$ -	\$ 66,660	\$ -
	Sub - Total	\$ 425,340	\$ -	\$ 425,340	\$ -
Pollocl-Cappon 7 GHz					
	Tower/Antenna	\$ 138,000	\$ -	\$ 138,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 162,000	\$ -	\$ 162,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 41,800	\$ -	\$ 41,800	\$ -
	Sub - Total	\$ 341,800	\$ -	\$ 341,800	\$ -
TOTAL - Telecommunication Project Costs		\$ 2,332,380	\$ -	\$ 2,332,380	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3a Stage 3
(Dec-2012). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
Substation Facilities	\$ 24,180,000	\$ -	\$ 24,180,000	\$ -
Telecommunication	\$ 912,400	\$ -	\$ 912,400	\$ -
Total Facility Costs	\$ 40,318,579	\$ -	\$ 40,318,579	\$ -
Owners Costs	\$ 3,512,468	\$ -	\$ 3,512,468	\$ -
Distributed Costs	\$ 2,468,287	\$ -	\$ 2,468,287	\$ -
Contingency	\$ 6,094,933	\$ -	\$ 6,094,933	\$ -
Total Owners and Dist. Costs	\$ 12,075,688	\$ -	\$ 12,075,688	\$ -
Total Direct Costs	\$ 52,394,267	\$ -	\$ 52,394,267	\$ -
Salvage Costs	\$ 14,650,000	\$ -	\$ 14,650,000	\$ -
E&S	\$ 5,363,541	\$ -	\$ 5,363,541	\$ -
AFUDC	\$ 5,213,362	\$ -	\$ 5,213,362	\$ -
Total Indirect Costs	\$ 25,226,904	\$ -	\$ 25,226,904	\$ -
TOTAL PROJECT COSTS	\$ 77,621,171	\$ -	\$ 77,621,171	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3a Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144 kV Pemukan to Veteran (7L224)	6 Km				
	Labour	\$ 821,680	\$ -	\$ 821,680	\$ -
	Materials	\$ 288,411	\$ -	\$ 288,411	\$ -
	Sub - Total	\$ 1,110,091	\$ -	\$ 1,110,091	\$ -
S/C 477 mcm 144 kV Coyote Lake to Michichi Creek (7L128)	42 Km				
	Labour	\$ 6,305,382	\$ -	\$ 6,305,382	\$ -
	Materials	\$ 2,778,291	\$ -	\$ 2,778,291	\$ -
	Sub - Total	\$ 9,083,673	\$ -	\$ 9,083,673	\$ -
and build a D/C (7L25 & 7L137) to new or expanded Rowley substation	24 Km				
	Labour	\$ 3,286,722	\$ -	\$ 438,230	\$ -
	Materials	\$ 1,153,644	\$ -	\$ 153,819	\$ -
	Sub - Total	\$ 4,440,366	\$ -	\$ 592,049	\$ -
Tap from 7L16 and build a D/C (7L16 & 7L159) to new Delburne substation	3 Km				
	Labour	\$ 438,230	\$ -	\$ 3,286,722	\$ -
	Materials	\$ 153,819	\$ -	\$ 1,153,644	\$ -
	Sub - Total	\$ 592,049	\$ -	\$ 4,440,366	\$ -
Salvage 7L98, 7LA98, 7L760, 7L79 & part of 7L224	278 Km				
	Labour	\$ 11,120,000	\$ -	\$ 11,120,000	\$ -
	Materials	\$ 2,780,000	\$ -	\$ 2,780,000	\$ -
	Sub - Total	\$ 13,900,000	\$ -	\$ 13,900,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 15,226,179	\$ -	\$ 15,226,179	\$ -
TOTAL - Transmission Salvage Costs		\$ 13,900,000	\$ -	\$ 13,900,000	\$ -

Substation - NID Estimate

Alt 3 Stage 3	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan Substation				
Capacitor Bank (1x30Mvar,144kV)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
802S Michichi Creek Substation				
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 200,000	\$ -	\$ 200,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 1,390,000	\$ -	\$ 1,390,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
New Delburne Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	
Circuit Breakers (2x 144 kV)	\$ 360,000	\$ -	\$ 360,000	
PTs (6 x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
New Rowley Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144 kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (6x 1Ø 144kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
CTs (2 x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 6,280,000	\$ -	\$ 6,280,000	\$ -
Salvage 72 kV Equipment	\$ 250,000	\$ -	\$ 250,000	
963S Coyote Lake Substation				

Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 144 kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 8,440,000	\$ -	\$ 8,440,000	\$ -
TOTAL - Substation Project Costs	\$ 24,180,000	\$ -	\$ 24,180,000	\$ -
TOTAL - Salvage Cost	\$ 750,000	\$ -	\$ 750,000	\$ -

Telecommunication NID Estimate

Alt 3 Stage 3		System Portion	Customer Portion	TOTAL	Capital Maintenance
802S Michichi Creek Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
Drumheller Tower Rebuild					
	Tower/Antenna	\$ 392,700	\$ -	\$ 392,700	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 22,800	\$ -	\$ 22,800	\$ -
	Sub - Total	\$ 415,500	\$ -	\$ 415,500	\$ -
Drum - Wintering 2GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ 55,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
Wintering - Ander 2 GHz					
	Tower/Antenna	\$ 20,000	\$ -	\$ 20,000	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 55,000	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 34,080	\$ -	\$ 34,080	\$ -
	Sub - Total	\$ 109,080	\$ -	\$ 109,080	\$ -
TOTAL - Telecommunication Project Costs		\$ 912,400	\$ -	\$ 912,400	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3a Stage 4
(Dec-2015). Revised version as per
AESO request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06, 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Substation Facilities	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -
Telecommunication	\$ 1,485,654	\$ -	\$ 1,485,654	\$ -
Total Facility Costs	\$ 25,315,381	\$ -	\$ 25,315,381	\$ -
Owners Costs	\$ 2,027,400	\$ -	\$ 2,027,400	\$ -
Distributed Costs	\$ 1,227,060	\$ -	\$ 1,227,060	\$ -
Contingency	\$ 3,431,984	\$ -	\$ 3,431,984	\$ -
Total Owners and Dist. Costs	\$ 6,686,444	\$ -	\$ 6,686,444	\$ -
Total Direct Costs	\$ 32,001,825	\$ -	\$ 32,001,825	\$ -
Salvage Costs	\$ 5,750,000	\$ -	\$ 5,750,000	\$ -
E&S	\$ 3,020,146	\$ -	\$ 3,020,146	\$ -
AFUDC	\$ 2,935,582	\$ -	\$ 2,935,582	\$ -
Total Indirect Costs	\$ 11,705,728	\$ -	\$ 11,705,728	\$ -
TOTAL PROJECT COSTS	\$ 43,707,553	\$ -	\$ 43,707,553	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3a Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
S/C 477 mcm 144kV Stettler to Nevis (7L143)	35 Km				
	Labour	\$ 5,254,485	\$ -	\$ 5,254,485	\$ -
	Materials	\$ 2,315,242	\$ -	\$ 2,315,242	\$ -
	Sub - Total	\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
Salvage 6L22 from Rowley to Michichi Creek	29 Km				
	Labour	\$ 1,160,000	\$ -	\$ 1,160,000	\$ -
	Materials	\$ 290,000	\$ -	\$ 290,000	\$ -
	Sub - Total	\$ 1,450,000	\$ -	\$ 1,450,000	\$ -
Salvage 6L44 from Rowley to 6L44D3 near Big Valley	42 km				
	Labour	\$ 1,680,000	\$ -	\$ 1,680,000	\$ -
	Materials	\$ 420,000	\$ -	\$ 420,000	\$ -
	Sub - Total	\$ 2,100,000	\$ -	\$ 2,100,000	\$ -
Salvage 6L31 between Delburne, Nevis and Stettler	44 km				
	Labour	\$ 1,760,000	\$ -	\$ 1,760,000	\$ -
	Materials	\$ 440,000	\$ -	\$ 440,000	\$ -
	Sub - Total	\$ 2,200,000	\$ -	\$ 2,200,000	\$ -
TOTAL - Transmission Line Project Costs		\$ 7,569,727	\$ -	\$ 7,569,727	\$ -
TOTAL - Transmission Line Salvage Costs		\$ 5,750,000	\$ -	\$ 5,750,000	\$ -

Substation - NID Estimate

Alt 3a Stage 4	System Portion	Customer Portion	TOTAL	Capital Maintenance
769S Stettler Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 2,000,000	\$ -	\$ 2,000,000	\$ -
Circuit Breakers (4x 144kV)	\$ 720,000	\$ -	\$ 720,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (2x 3Ø 144kV)	\$ 100,000	\$ -	\$ 100,000	\$ -
Transformer (1x 72/25kV, 33.3MVA)	\$ 1,500,000	\$ -	\$ 1,500,000	
Circuit Breakers (1x 72kV)	\$ 160,000	\$ -	\$ 160,000	\$ -
PTs (3 x 1Ø 72kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 72kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Capacitor Bank (1x144kV, 15 Mvar)	\$ 450,000	\$ -	\$ 450,000	
Switch Yard and Substation Control Building	\$ 3,000,000	\$ -	\$ 3,000,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 200,000	\$ -	\$ 200,000	\$ -
<Misc.>	\$ 250,000	\$ -	\$ 250,000	\$ -
Sub - Total	\$ 9,750,000	\$ -	\$ 9,750,000	\$ -
766S Nevis Substation				
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 1,250,000	\$ -	\$ 1,250,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 150,000	\$ -	\$ 150,000	\$ -
Sub - Total	\$ 4,720,000	\$ -	\$ 4,720,000	\$ -
959S Lanfine Substation				
Capacitor Bank (1x144kV 30MVar)	\$ 600,000	\$ -	\$ 600,000	\$ -
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 500,000	\$ -	\$ 500,000	\$ -
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000	\$ -
SCADA	\$ 50,000	\$ -	\$ 50,000	\$ -
<Misc.>	\$ 100,000	\$ -	\$ 100,000	\$ -
Sub - Total	\$ 1,790,000	\$ -	\$ 1,790,000	\$ -
TOTAL - Substation Project Costs	\$ 16,260,000	\$ -	\$ 16,260,000	\$ -

Telecommunication NID Estimate

Alt 3 Stage 4		System Portion	Customer Portion	TOTAL	Capital Maintenance
768S Rowley Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 160,080	\$ -	\$ 160,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 289,740	\$ -	\$ 289,740	\$ -
770S Three Hills Sub					
	Tower/Antenna	\$ 79,100	\$ -	\$ 79,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 278,740	\$ -	\$ 278,740	\$ -
760S Delburne Sub					
	Tower/Antenna	\$ 129,690	\$ -	\$ 129,690	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 143,088	\$ -	\$ 143,088	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 50,116	\$ -	\$ 50,116	\$ -
	Sub - Total	\$ 322,894	\$ -	\$ 322,894	\$ -
769S Stettler Sub					
	Tower/Antenna	\$ 84,100	\$ -	\$ 84,100	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 154,080	\$ -	\$ 154,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 283,740	\$ -	\$ 283,740	\$ -
766S Nevis - Elnora 2 GHz MHSB					
	Tower/Antenna	\$ 87,900	\$ -	\$ 87,900	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 177,080	\$ -	\$ 177,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 310,540	\$ -	\$ 310,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 1,485,654	\$ -	\$ 1,485,654	\$ -

Estimate Summary for Need Identification Document (NID)



THE POWER OF POSSIBILITY

Project: **Hanna Area Transmission
Development - Alternative 3a Stage 5
(2017). Revised version as per AESO
request**

TFO: ATCO Electric

NID Estimate is valid for 90 days from Aug 06 2009

Prepared by: Edgar Tse

Date: 08-06-2009

Accuracy:

+/- 30 %

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 35,496,334	\$ -	\$ 35,496,334	\$ -
Substation Facilities	\$ 50,490,000	\$ -	\$ 50,490,000	\$ -
Telecommunication	\$ 577,540	\$ -	\$ 577,540	\$ -
Total Facility Costs	\$ 86,563,874	\$ -	\$ 86,563,874	\$ -
Owners Costs	\$ 6,981,482	\$ -	\$ 6,981,482	\$ -
Distributed Costs	\$ 6,101,141	\$ -	\$ 6,101,141	\$ -
Contingency	\$ 9,964,650	\$ -	\$ 9,964,650	\$ -
Total Owners and Dist. Costs	\$ 23,047,273	\$ -	\$ 23,047,273	\$ -
Total Direct Costs	\$ 109,611,147	\$ -	\$ 109,611,147	\$ -
Salvage Costs	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
E&S	\$ 9,024,892	\$ -	\$ 9,024,892	\$ -
AFUDC	\$ 8,772,195	\$ -	\$ 8,772,195	\$ -
Total Indirect Costs	\$ 20,997,087	\$ -	\$ 20,997,087	\$ -
TOTAL PROJECT COSTS	\$ 130,608,233	\$ -	\$ 130,608,233	\$ -

Total Cost Reflects 2009 Dollars

Scope of Work - See attached scope sheet

Assumptions and Risks - see attached sheet

Transmission Line - NID Estimate

Alternative 3a Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
String the open side of the 7L141 from Lanfine to Oyen	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
String the open side of the 7L151 from Pemukan to Monitor	6 Km				
	Labour	\$ 505,327	\$ -	\$ 505,327	\$ -
	Materials	\$ 177,601	\$ -	\$ 177,601	\$ -
	Sub - Total	\$ 682,928	\$ -	\$ 682,928	\$ -
Salvage 6L56 between Michichi and Hanna	64 Km				
	Labour	\$ 2,560,000	\$ -	\$ 2,560,000	\$ -
	Materials	\$ 640,000	\$ -	\$ 640,000	\$ -
	Sub - Total	\$ 3,200,000	\$ -	\$ 3,200,000	\$ -
D/C one side string 240kV 2x477 mcm from Cordel to Halkirk Switch Station (9L49)	17 Km				
	Labour	\$ 8,194,986	\$ -	\$ 8,194,986	\$ -
	Materials	\$ 3,056,702	\$ -	\$ 3,056,702	\$ -
	Sub - Total	\$ 11,251,688	\$ -	\$ 11,251,688	\$ -
String the open side of the 240kV D/C 2x 477 mcm from Oakland to Coyote Lake (9L31)	38 Km				
	Labour	\$ 3,200,406	\$ -	\$ 3,200,406	\$ -

	Materials	\$ 1,124,807	\$ -	\$ 1,124,807	\$ -
	Sub - Total	\$ 4,325,213	\$ -	\$ 4,325,213	\$ -
S/C 477mcm 144kV from Coyoe Lake to Hanna (7L108)					
	Labour	\$ 6,005,126	\$ -	\$ 6,005,126	\$ -
	Materials	\$ 2,645,991	\$ -	\$ 2,645,991	\$ -
	Sub - Total	\$ 8,651,117	\$ -	\$ 8,651,117	\$ -
String the open side of the 240kV D/C 2x 477 mcm from Oakland to Lanfine (9L65)	87 Km				
	Labour	\$ 7,327,244	\$ -	\$ 7,327,244	\$ -
	Materials	\$ 2,575,216	\$ -	\$ 2,575,216	\$ -
	Sub - Total	\$ 9,902,460	\$ -	\$ 9,902,460	\$ -
TOTAL - Transmission Line Project Costs		\$ 35,496,334	\$ -	\$ 35,496,334	\$ -
TOTAL - Transmission Line Salvage Costs		\$3,200,000	\$-	\$3,200,000	\$-

Substation - NID Estimate

Alt 3a Stage 5	System Portion	Customer Portion	TOTAL	Capital Maintenance
932S Pemukan				
Transformer (1x 240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1 x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 3,750,000	\$ -	\$ 3,750,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -
Sub - Total	\$ 13,000,000	\$ -	\$ 13,000,000	\$ -
959S Lanfine Substation				
Transformer (1x240/144kV, 180/240/300MVA)	\$ 6,000,000	\$ -	\$ 6,000,000	\$ -
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000	\$ -
PTs (3x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000	
PTs (3x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	
Switch Yard and Substation Control Building	\$ 3,750,000	\$ -	\$ 3,750,000	\$ -
Protection, control, metering	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
SCADA	\$ 150,000	\$ -	\$ 150,000	\$ -
<Misc.>	\$ 1,000,000	\$ -	\$ 1,000,000	\$ -
Sub - Total	\$ 13,000,000	\$ -	\$ 13,000,000	\$ -
946S Oakland Substation				
Circuit Breakers (3x 240kV)	\$ 1,200,000	\$ -	\$ 1,200,000	\$ -
PTs (15 x 1Ø 240kV)	\$ 450,000	\$ -	\$ 450,000	\$ -
CTs (3 x 3Ø 240kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -
Sub - Total	\$ 5,510,000	\$ -	\$ 5,510,000	\$ -
963S Coyote Substation				
Circuit Breakers (2x 240kV)	\$ 800,000	\$ -	\$ 800,000	\$ -
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000	\$ -
CTs (1x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000	\$ -
Circuit Breakers (2x 144kV)	\$ 360,000	\$ -	\$ 360,000	\$ -
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000	\$ -
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000	\$ -
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000	\$ -
Protection, control, metering	\$ 900,000	\$ -	\$ 900,000	\$ -
SCADA	\$ 100,000	\$ -	\$ 100,000	\$ -
<Misc.>	\$ 300,000	\$ -	\$ 300,000	\$ -

Sub - Total	\$ 5,280,000	\$ -	\$ 5,280,000
772S Youngstown Substation			
1 x 72kV, 5 MVAR Cap Bank	\$150,000	\$-	\$150,000
Circuit Breakers (1x 72kV)	\$160,000	\$-	\$160,000
PTs (3 x 1Ø 72kV)	\$60,000	\$-	\$60,000
CTs (1 x 3Ø 72kV)	\$50,000	\$-	\$50,000
Switch Yard and Substation Control Building	\$400,000	\$-	\$400,000
Protection, control, metering	\$150,000	\$-	\$150,000
SCADA	\$50,000	\$-	\$50,000
<Misc.>	\$100,000	\$-	\$100,000
Sub - Total	\$1,120,000	\$-	\$1,120,000
767S Oyen Substation			
Circuit Breakers (1x 144kV)	\$ 180,000	\$ -	\$ 180,000
PTs (3x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000
Protection, control, metering	\$ 120,000	\$ -	\$ -
SCADA	\$ 20,000	\$ -	\$ 20,000
<Misc.>	\$ 50,000	\$ -	\$ 50,000
Sub - Total	\$ 760,000	\$ -	\$ 760,000
774S Monitor Substation			
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000
PTs (3 x 1Ø 144kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 250,000	\$ -	\$ 250,000
Protection, control, metering	\$ 120,000	\$ -	\$ 120,000
SCADA	\$ 20,000	\$ -	\$ 20,000
<Misc.>	\$ 50,000	\$ -	\$ 50,000
Sub - Total	\$ 760,000	\$ -	\$ 760,000
763S Hanna Substation			
Transformer (1x 144/25kV, 25MVA)	\$ 1,800,000	\$ -	\$ 1,800,000
Circuit Breakers (1 x 144kV)	\$ 180,000	\$ -	\$ 180,000
PTs (3 x 1Ø 144kV)	\$ 60,000	\$ -	\$ 60,000
CTs (1 x 3Ø 144kV)	\$ 50,000	\$ -	\$ 50,000
Switch Yard and Substation Control Building	\$ 2,500,000	\$ -	\$ 2,500,000
Protection, control, metering	\$ 600,000	\$ -	\$ 600,000
SCADA	\$ 150,000	\$ -	\$ 150,000
<Misc.>	\$ 200,000	\$ -	\$ 200,000
Sub - Total	\$ 5,540,000	\$ -	\$ 5,540,000
755S Cordel Substation			
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000
Switch Yard and Substation Control Building	\$ 1,750,000	\$ -	\$ 1,750,000
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000
SCADA	\$ 50,000	\$ -	\$ 50,000
<Misc.>	\$ 100,000	\$ -	\$ 100,000
Sub - Total	\$ 2,760,000	\$ -	\$ 2,760,000

[illegible]

401S Halkirk Substation			
Circuit Breakers (1x 240kV)	\$ 400,000	\$ -	\$ 400,000
PTs (3 x 1Ø 240kV)	\$ 90,000	\$ -	\$ 90,000
CTs (1 x 3Ø 240kV)	\$ 120,000	\$ -	\$ 120,000
Switch Yard and Substation Control Building	\$ 1,750,000	\$ -	\$ 1,750,000
Protection, control, metering	\$ 250,000	\$ -	\$ 250,000
SCADA	\$ 50,000	\$ -	\$ 50,000
<Misc.>	\$ 100,000	\$ -	\$ 100,000
Sub - Total	\$ 2,760,000	\$ -	\$ 2,760,000
TOTAL - Substation Project Costs	\$ 50,490,000	\$ -	\$ 50,490,000

\$ -
\$ -
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Telecommunication NID Estimate

Alt 3 Stage 5		System Portion	Customer Portion	TOTAL	Capital Maintenance
Misc Telecom Support					
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 150,000	\$ -	\$ 150,000	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 150,000	\$ -	\$ 150,000	\$ -
	Sub - Total	\$ 300,000	\$ -	\$ 300,000	\$ -
763S Hanna Substation					
		\$ -			
	Tower/Antenna	\$ 62,900	\$ -	\$ 62,900	\$ -
	\$ -	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 169,080	\$ -	\$ 169,080	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	Telecom system Installation	\$ 45,560	\$ -	\$ 45,560	\$ -
	Sub - Total	\$ 277,540		\$ 277,540	\$ -
TOTAL - Telecommunication Project Costs		\$ 577,540	\$ -	\$ 577,540	\$ -

ALTA LINK

Project:	Hanna Area Transmission Development - Development # 1 & 3 - Alternative 1 (2009\$)
TFO:	AltaLink
Prepared by:	Roderick Leonard
Date:	April 28, 2009
Accuracy:	+30%/-15%

	System Portion	Customer Portion	TOTAL
Transmission Lines	\$ 27,535,000	\$ -	\$ 27,535,000
Substation Facilities	\$ 19,641,000	\$ -	\$ 19,641,000
Telecommunication	\$ 753,000	\$ -	\$ 753,000
Total Facility Costs	\$ 47,929,000	\$ -	\$ 47,929,000
Owners Costs	\$ 1,207,000	\$ -	\$ 1,207,000
Distributed Costs	\$ 10,204,000	\$ -	\$ 10,204,000
Total Owners and Dist. Costs	\$ 11,411,000	\$ -	\$ 11,411,000
Total Direct Costs	\$ 59,340,000	\$ -	\$ 59,340,000
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ 4,747,000	\$ -	\$ 4,747,000
AFUDC	\$ 5,960,000	\$ -	\$ 5,960,000
Total Indirect Costs	\$ 10,707,000	\$ -	\$ 10,707,000
TOTAL PROJECT COSTS	\$ 70,047,000	\$ -	\$ 70,047,000

Capital Maintenance	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-

Assumptions and Risks

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	138kV Line from existing 681L to Nilrem				
	3 km of line using 1x477 ACSR Hawk that is D/C w/o underbuild (single conductor per phase)	\$ 1,196,304	\$ -	\$ 1,196,304	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 1,196,304	\$ -	\$ 1,196,304	\$ -
Line 2	138kV Line from Tucuman to Nilrem				
	3 km of line using 1x477 ACSR Hawk that is D/C w/o underbuild (single conductor per phase)	\$ 1,064,177	\$ -	\$ 1,064,177	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 1,064,177	\$ -	\$ 1,064,177	\$ -
Line 3	240kV Line from Nilrem to 953L				
	30 km of line using 2x477 ACSR Hawk that is D/C w/o underbuild	\$ 25,274,519	\$ -	\$ 25,274,519	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 25,274,519	\$ -	\$ 25,274,519	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 27,535,000	\$ -	\$ 27,535,000	\$ -

Substation - NID Estimate

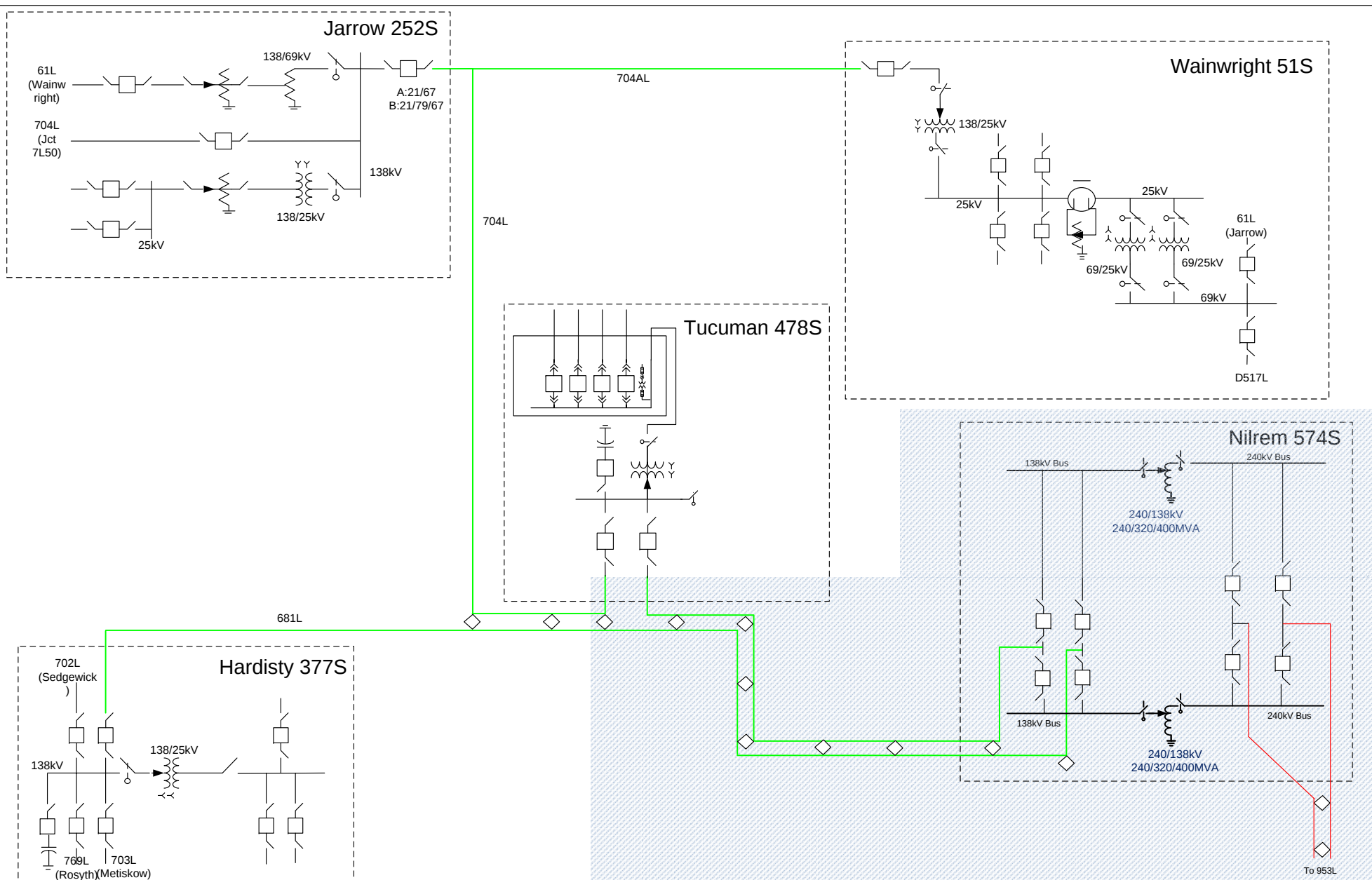
		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Nilrem 574S				
	Transformers <2, 300MVA, and 240/138kV>	\$ 8,783,946	\$ -	\$ 8,783,946	\$ -
	Circuit Breakers 240kV	\$ 1,126,003	\$ -	\$ 1,126,003	\$ -
	Circuit Breakers 138kV	\$ 612,786	\$ -	\$ 612,786	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ 726,739	\$ -	\$ 726,739	\$ -
	Switch Yard and Substation Control Building	\$ 7,137,131	\$ -	\$ 7,137,131	\$ -
	Protection, control, metering	\$ 1,101,013	\$ -	\$ 1,101,013	\$ -
	SCADA	\$ 138,733	\$ -	\$ 138,733	\$ -
	<Misc.>	\$ 14,663	\$ -	\$ 14,663	\$ -
	Sub - Total	\$ 19,641,014	\$ -	\$ 19,641,014	\$ -
Sub 2	Sub 2 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 19,641,014	\$ -	\$ 19,641,014	\$ -

Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Tucuman 478S				
	Tower/Antenna	\$ 37,008	\$ -	\$ 37,008	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 121,477	\$ -	\$ 121,477	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 158,486	\$ -	\$ 158,486	\$ -
Telecom 2	Nilrem 574S				
	Tower/Antenna	\$ 261,316	\$ -	\$ 261,316	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ 333,055	\$ -	\$ 333,055	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 594,371	\$ -	\$ 594,371	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ 752,857	\$ -	\$ 752,857	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 27,535,000	\$ -	\$ 27,535,000	\$ -
Substation Project Costs	\$ 19,641,014	\$ -	\$ 19,641,014	\$ -
Telecommunications Project Costs	\$ 752,857	\$ -	\$ 752,857	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 47,928,870	\$ -	\$ 47,928,870	\$ -
Owners Cost				
Preliminary Engineering	\$ 25,000	\$ -	\$ 25,000	\$ -
Siting	\$ 300,000	\$ -	\$ 300,000	\$ -
Protection Settings	\$ 180,000	\$ -	\$ 180,000	\$ -
Land	\$ 702,271	\$ -	\$ 702,271	\$ -
Sub - Total	\$ 1,207,271	\$ -	\$ 1,207,271	\$ -
Distributed Cost				
Distributed Cost	\$ 4,809,377	\$ -	\$ 4,809,377	\$ -
Contingency	\$ 5,394,552	\$ -	\$ 5,394,552	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 10,203,929	\$ -	\$ 10,203,929	\$ -
Indirect Costs				
E&S	\$ 4,747,206	\$ -	\$ 4,747,206	\$ -
AFUDC	\$ 5,960,117	\$ -	\$ 5,960,117	\$ -
Sub - Total	\$ 10,707,322	\$ -	\$ 10,707,322	\$ -
Total Project Cost	\$ 70,047,392	\$ -	\$ 70,047,392	\$ -



	69kV
	138kV
	240kV
	Equipment to be Added

292

Estimate Summary for Need Identification Document (NID)



Project: Hanna Area Transmission Development
 Amended Dev #2, 20 km of 240 kV D/C, one side strung
 (2 X 477 kmil), 240 kV substation additions

TFO: AltaLink
Prepared by: Teshmont
Date: July 31, 2009
Accuracy: +30%/-30%

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Transmission Lines	\$ 9,980,052	\$ -	\$ 9,980,052	\$ -
Substation Facilities	\$ 3,141,285	\$ -	\$ 3,141,285	\$ -
Telecommunication	\$ -	\$ -	\$ -	\$ -
Total Facility Costs	\$ 13,121,337	\$ -	\$ 13,121,337	\$ -
Owners Costs	\$ 392,000	\$ -	\$ 392,000	\$ -
Distributed Costs	\$ 5,341,278	\$ -	\$ 5,341,278	\$ -
Total Owners and Dist. Costs	\$ 5,733,278	\$ -	\$ 5,733,278	\$ -
Total Direct Costs	\$ 18,854,615	\$ -	\$ 18,854,615	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Other Costs				
E&S	\$ 1,352,118	\$ -	\$ 1,352,118	\$ -
AFUDC	\$ 1,879,226	\$ -	\$ 1,879,226	\$ -
Total Indirect Costs	\$ 3,231,345	\$ -	\$ 3,231,345	\$ -
TOTAL PROJECT COSTS	\$ 22,085,960	\$ -	\$ 22,085,960	\$ -

Assumptions and Risks

Costs are shown in \$2012

Please refer to list of Assumptions and Risks

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	Hansmen Lake 650S to ATCO territory				
	20 km of 240 kV line using 2 X 477 that is D/C one side strung	\$ 9,980,052	\$ -	\$ 9,980,052	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 9,980,052	\$ -	\$ 9,980,052	\$ -
Line 2	Line 2 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 3	Line 3 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 9,980,052	\$ -	\$ 9,980,052	\$ -

Substation - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Hansman Lake 650S				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	240 kV Circuit Breakers < qty: 3, live tank>	\$ 911,232	\$ -	\$ 911,232	\$ -
	240 kV Disconnects <qty: 6 Manual and 2 Motor operated>	\$ 499,841	\$ -	\$ 499,841	\$ -
		\$ -	\$ -	\$ -	\$ -
	240 kV PT's, CT's and SA's <qty: 2 PT's; 3 CT's and 2 SA's>	\$ 159,665	\$ -	\$ 159,665	\$ -
	240 kV Protection, control, metering	\$ 598,014	\$ -	\$ 598,014	\$ -
	SCADA	\$ 630,807	\$ -	\$ 630,807	\$ -
	Switch Yard	\$ 257,928	\$ -	\$ 257,928	\$ -
	Site Developments	\$ 27,500	\$ -	\$ 27,500	\$ -
	Station Energization	\$ 56,298	\$ -	\$ 56,298	\$ -
	Sub - Total	\$ 3,141,285	\$ -	\$ 3,141,285	\$ -
Sub 2	Sub 2 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 3,141,285	\$ -	\$ 3,141,285	\$ -

Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Telecom 1 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 2	Telecom 2 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 9,980,052	\$ -	\$ 9,980,052	\$ -
Substation Project Costs	\$ 3,141,285	\$ -	\$ 3,141,285	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 13,121,337	\$ -	\$ 13,121,337	\$ -
Owners Cost				
Preliminary Engineering	\$ 25,000	\$ -	\$ 25,000	\$ -
Siting	\$ 150,000	\$ -	\$ 150,000	\$ -
Protection Settings	\$ 35,000	\$ -	\$ 35,000	\$ -
Land	\$ 182,000	\$ -	\$ 182,000	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 392,000	\$ -	\$ 392,000	\$ -
Distributed Cost				
Distributed Cost	\$ 1,851,645	\$ -	\$ 1,851,645	\$ -
Contingency	\$ 1,536,498	\$ -	\$ 1,536,498	\$ -
Escalation	\$ 1,953,135	\$ -	\$ 1,953,135	\$ -
Sub - Total	\$ 5,341,278	\$ -	\$ 5,341,278	\$ -
Indirect Costs				
E&S	\$ 1,352,118	\$ -	\$ 1,352,118	\$ -
AFUDC	\$ 1,879,226	\$ -	\$ 1,879,226	\$ -
Sub - Total	\$ 3,231,345	\$ -	\$ 3,231,345	\$ -
Total Project Cost	\$ 22,085,960	\$ -	\$ 22,085,960	\$ -

Estimate Summary for Need Identification Document (NID)



Project: Amended Development #11/#12, SLD 09-538 (2009\$)
 2 X 477 240 kV Line and Substation Upgrades
TFO: AltaLink
Prepared by: Arnie Reimer
Date: July 17, 2009
Accuracy: +30%/-15%

	System Portion	Customer Portion	TOTAL
Transmission Lines	\$ 27,735,000	\$ -	\$ 27,735,000
Substation Facilities	\$ 5,772,000	\$ -	\$ 5,772,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ 33,507,000	\$ -	\$ 33,507,000
Owners Costs	\$ 2,468,115	\$ -	\$ 2,468,115
Distributed Costs	\$ 5,180,000	\$ -	\$ 5,180,000
Total Owners and Dist. Costs	\$ 7,648,115	\$ -	\$ 7,648,115
Total Direct Costs	\$ 41,155,115	\$ -	\$ 41,155,115
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ 3,292,000	\$ -	\$ 3,292,000
AFUDC	\$ 4,134,000	\$ -	\$ 4,134,000
Total Indirect Costs	\$ 7,426,000	\$ -	\$ 7,426,000
TOTAL PROJECT COSTS	\$ 48,581,115	\$ -	\$ 48,581,115

Capital Maintenance
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -
\$ -

Assumptions and Risks

In-Service Date of 2013
 SATR Development is Complete before this Development
 D/C Construction, first side strung

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	Ware Junction to New West Brooks				
	"28.8" km of line using 2X477 that is D/C first side strung only with OPGW	\$ 27,735,018	\$ -	\$ 27,735,018	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 27,735,018	\$ -	\$ 27,735,018	\$ -
Line 2	Line 2 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 3	Line 3 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 27,735,018	\$ -	\$ 27,735,018	\$ -

Substation - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Ware Junction Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers Post SATR Development	\$ 3,451,329	\$ -	\$ 3,451,329	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 3,451,329	\$ -	\$ 3,451,329	\$ -
Sub 2	New West Brooks Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <2 X 240 kV>	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 5,772,326	\$ -	\$ 5,772,326	\$ -

Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Telecom 1 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 2	Telecom 2 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 27,735,018	\$ -	\$ 27,735,018	\$ -
Substation Project Costs	\$ 5,772,326	\$ -	\$ 5,772,326	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 33,507,344	\$ -	\$ 33,507,344	\$ -
Owners Cost				
Preliminary Engineering	\$ 50,000	\$ -	\$ 50,000	\$ -
Siting	\$ 25,000	\$ -	\$ 25,000	\$ -
Protection Settings	\$ 16,000	\$ -	\$ 16,000	\$ -
Land	\$ 2,377,115	\$ -	\$ 2,377,115	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 2,468,115	\$ -	\$ 2,468,115	\$ -
Distributed Cost				
Distributed Cost	\$ 1,439,018	\$ -	\$ 1,439,018	\$ -
Contingency	\$ 3,741,448	\$ -	\$ 3,741,448	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 5,180,466	\$ -	\$ 5,180,466	\$ -
Indirect Costs				
E&S	\$ 3,292,474	\$ -	\$ 3,292,474	\$ -
AFUDC	\$ 4,133,701	\$ -	\$ 4,133,701	\$ -
Sub - Total	\$ 7,426,175	\$ -	\$ 7,426,175	\$ -
Total Project Cost	\$ 48,582,100	\$ -	\$ 48,582,100	\$ -

ALTA LINK

Project:	Amended Development #11/#12, SLD 09-538 (2009\$) 1 X 1033 240 kV Line and Substation Upgrades
TFO:	AltaLink
Prepared by:	Arnie Reimer
Date:	July 17, 2009
Accuracy:	+30%/-15%

	System Portion	Customer Portion	TOTAL
Transmission Lines	\$ 26,335,000	\$ -	\$ 26,335,000
Substation Facilities	\$ 5,772,000	\$ -	\$ 5,772,000
Telecommunication	\$ -	\$ -	\$ -
Total Facility Costs	\$ 32,107,000	\$ -	\$ 32,107,000
Owners Costs	\$ 2,468,115	\$ -	\$ 2,468,115
Distributed Costs	\$ 4,979,000	\$ -	\$ 4,979,000
Total Owners and Dist. Costs	\$ 7,447,115	\$ -	\$ 7,447,115
Total Direct Costs	\$ 39,554,115	\$ -	\$ 39,554,115
Salvage Costs	\$ -	\$ -	\$ -
Other Costs			
E&S	\$ 3,164,000	\$ -	\$ 3,164,000
AFUDC	\$ 3,973,000	\$ -	\$ 3,973,000
Total Indirect Costs	\$ 7,137,000	\$ -	\$ 7,137,000
TOTAL PROJECT COSTS	\$ 46,691,115	\$ -	\$ 46,691,115

Capital Maintenance	
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-
\$	-

Assumptions and Risks

In-Service Date of 2013
SATR Development is Complete before this Development
D/C Construction, first side strung

Transmission Line - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Line 1	Ware Junction to New West Brooks				
	"28.8" km of line using 1x1033 that is D/C first side strung only with OPGW	\$ 26,334,930	\$ -	\$ 26,334,930	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 26,334,930	\$ -	\$ 26,334,930	\$ -
Line 2	Line 2 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks/Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 3	Line 3 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 4	Line 4 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 5	Line 5 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Line 6	Line 6 Description				
	"X" km of line using <conductor type> that is <S/C; D/C> c/w or w/o underbuild	\$ -	\$ -	\$ -	\$ -
	Switches / Airbreaks / Taps	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Transmission Line Project Costs		\$ 26,334,930	\$ -	\$ 26,334,930	\$ -

Substation - NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Sub 1	Ware Junction Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers Post SATR Development	\$ 3,451,329	\$ -	\$ 3,451,329	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 3,451,329	\$ -	\$ 3,451,329	\$ -
Sub 2	New West Brooks Modification				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <2 X 240 kV>	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ 2,320,997	\$ -	\$ 2,320,997	\$ -
Sub 3	Sub 3 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 4	Sub 4 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 5	Sub 5 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Sub 6	Sub 6 Description				
	Transformers <number, size, and voltage>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 1>	\$ -	\$ -	\$ -	\$ -
	Circuit Breakers <voltage 2>	\$ -	\$ -	\$ -	\$ -
	Capacitor Bank <size, voltage>	\$ -	\$ -	\$ -	\$ -
	Reactor Bank	\$ -	\$ -	\$ -	\$ -
	PT's & CT's <quantity, voltage>	\$ -	\$ -	\$ -	\$ -
	Switch Yard and Substation Control Building	\$ -	\$ -	\$ -	\$ -
	Protection, control, metering	\$ -	\$ -	\$ -	\$ -
	SCADA	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Substation Project Costs		\$ 5,772,326	\$ -	\$ 5,772,326	\$ -

Telecommunication NID Estimate

		System Portion	Customer Portion	TOTAL	Capital Maintenance
Telecom 1	Telecom 1 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 2	Telecom 2 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 3	Telecom 3 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 4	Telecom 4 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 5	Telecom 5 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
Telecom 6	Telecom 6 Description				
	Tower/Antenna	\$ -	\$ -	\$ -	\$ -
	Fiber (km)	\$ -	\$ -	\$ -	\$ -
	Radio Equipment	\$ -	\$ -	\$ -	\$ -
	Building (If substation building not utilized)	\$ -	\$ -	\$ -	\$ -
	<Misc.>	\$ -	\$ -	\$ -	\$ -
	Sub - Total	\$ -	\$ -	\$ -	\$ -
TOTAL - Telecommunication Project Costs		\$ -	\$ -	\$ -	\$ -

Estimate Summary with Owner's Cost

	System Portion	Customer Portion	TOTAL	Capital Maintenance
Facility Cost				
Transmission Line Project Costs	\$ 26,334,930	\$ -	\$ 26,334,930	\$ -
Substation Project Costs	\$ 5,772,326	\$ -	\$ 5,772,326	\$ -
Telecommunications Project Costs	\$ -	\$ -	\$ -	\$ -
Salvage Costs	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 32,107,256	\$ -	\$ 32,107,256	\$ -
Owners Cost				
Preliminary Engineering	\$ 50,000	\$ -	\$ 50,000	\$ -
Siting	\$ 25,000	\$ -	\$ 25,000	\$ -
Protection Settings	\$ 16,000	\$ -	\$ 16,000	\$ -
Land	\$ 2,377,115	\$ -	\$ 2,377,115	\$ -
Metering	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 2,468,115	\$ -	\$ 2,468,115	\$ -
Distributed Cost				
Distributed Cost	\$ 1,383,015	\$ -	\$ 1,383,015	\$ -
Contingency	\$ 3,595,839	\$ -	\$ 3,595,839	\$ -
Escalation	\$ -	\$ -	\$ -	\$ -
Sub - Total	\$ 4,978,853	\$ -	\$ 4,978,853	\$ -
Indirect Costs				
E&S	\$ 3,164,338	\$ -	\$ 3,164,338	\$ -
AFUDC	\$ 3,972,826	\$ -	\$ 3,972,826	\$ -
Sub - Total	\$ 7,137,164	\$ -	\$ 7,137,164	\$ -
Total Project Cost	\$ 46,691,388	\$ -	\$ 46,691,388	\$ -