

**Alaska Hydro Corporation**

**More Creek Hydroelectric Project  
Prefeasibility Study**



June 2015  
E6348



**SIGMA ENGINEERING LTD**

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## PREFACE

This study has been prepared exclusively for Alaska Hydro Corporation for the purposes of assessing the proposed More Creek hydroelectric project. No third party is entitled to rely on this analysis without the express written permission of Sigma Engineering Ltd and Alaska Hydro Corporation.

## 1. BACKGROUND

Alaska Hydro Corp. (AHC) is interested in a prefeasibility study for the proposed More Creek hydroelectric project, located approximately 10 km northwest from Bob Quinn Lake in the Skeena region of British Columbia.

The present study will use the existing project layout and characteristics, as described in the submitted Water License Application. The 75 MW project consists of access roads, an intake, a dam, a tunnel and penstock, powerhouse and generating equipment, transmission line and interconnection to the Bob Quinn BC Hydro substation (see Figures 1 and 2).

Below we describe our methodology and assumptions in developing a model to estimate the projected revenues (hydrology and generation model), and our considerations for developing prefeasibility cost estimates for the project.

## 2. HYDROLOGY

The hydrology is based on flow data from the Water Survey Canada (WSC) streamflow gauge '08CG005 – More Creek near the mouth'. The gauge was located near the proposed intake site and was active from 1972 to 1995 and has a set of 19 complete years of daily flow data available. The drainage area of WSC 08CG005 is 844 km<sup>2</sup>, which is the same as the drainage at the intake of the proposed project. Thus the flow data from the WSC gauge are used without any adjustments as the basis of the hydrology at the site.

The mean monthly and annual flows at the site are shown in Table 1 below:

Table 1. Mean Monthly and Annual Flows at proposed intake

	1974	1975	1977	1978	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Average
Jan	5.3	8.7	8.0	5.8	6.7	12.3	5.8	6.0	4.4	6.0	4.9	8.0	7.6	7.5	7.4	7.2	8.3	6.8	6.6	7.0
Feb	4.5	7.5	8.2	5.0	8.2	8.7	4.9	4.9	5.6	4.8	4.0	6.4	5.5	7.2	5.3	6.8	8.3	6.8	4.6	6.2
Mar	4.5	6.2	6.3	4.0	5.8	7.5	4.3	4.3	5.3	5.0	7.5	5.4	4.9	6.1	5.5	4.5	12.4	5.9	8.6	6.0
Apr	7.5	6.0	14.1	9.1	12.1	8.9	5.3	12.6	9.0	6.0	9.0	10.2	14.6	11.9	14.5	13.4	18.6	17.6	16.2	11.4
May	29.6	36.6	43.9	33.0	58.7	67.5	24.5	56.3	49.4	37.1	36.4	38.5	57.0	47.3	59.5	67.5	50.6	102.9	56.3	50.1
Jun	64.9	100.6	108.3	110.3	153.7	105.2	129.2	132.7	98.4	99.3	105.5	87.5	110.9	122.8	127.8	134.5	163.2	139.7	98.7	115.4
Jul	89.1	172.3	135.3	120.1	138.0	135.3	150.8	119.5	115.7	160.1	162.8	150.3	126.6	144.1	137.1	125.4	196.3	151.2	132.0	140.1
Aug	104.3	91.1	150.2	119.6	96.6	114.6	105.0	106.7	130.7	98.2	93.2	88.0	109.4	128.4	140.9	112.5	100.7	105.3	117.6	111.2
Sep	87.9	32.7	49.2	45.3	71.3	127.3	68.2	53.3	37.5	59.2	47.2	80.2	68.6	77.5	97.2	76.0	45.3	57.5	113.7	68.2
Oct	104.7	17.3	29.7	69.2	98.0	41.4	43.9	26.5	31.3	26.5	74.0	51.0	43.6	41.3	29.5	50.0	27.4	69.5	37.1	48.0
Nov	30.7	11.4	10.7	17.3	24.2	30.1	12.2	16.0	9.7	10.1	20.4	24.8	15.9	18.8	16.4	14.3	16.4	20.9	18.3	17.8
Dec	12.0	5.3	6.8	7.0	16.1	9.7	7.4	6.0	6.2	4.7	4.9	13.3	9.7	11.7	10.4	11.7	9.8	10.6	7.6	9.0
Annual	45.7	41.6	47.9	45.8	57.8	56.0	47.1	45.6	42.3	43.4	47.9	47.3	48.1	52.4	54.6	52.3	55.1	58.3	51.7	49.5

### 3. GENERATION AND REVENUE ESTIMATES

A spreadsheet model is used to calculate the monthly and annual generation at the site. The model uses 19 complete years of daily flows as the basis of the calculations.

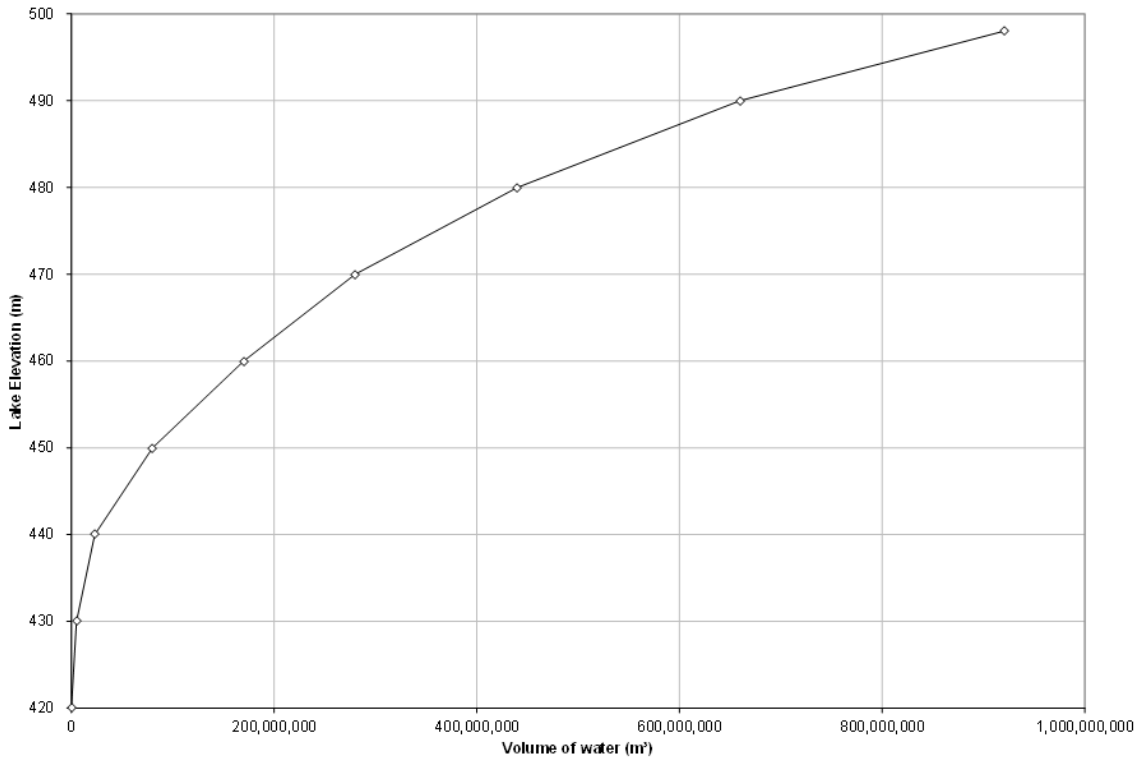
#### Assumptions

The basic assumptions used in the model are:

Design flow	80 m <sup>3</sup> /s
Dam crest elevation	498 m
Minimum lake level	468 m
Mean tailwater level	380 m
Gross head	88 - 118 m
Instream flow release	2.476 m <sup>3</sup> /s (5% of mean annual flow)
Minimum turbine flow	20 m <sup>3</sup> /s
Installed Capacity	75.2 MW
Generating equipment efficiency	86.45%
Friction head loss (waterway)	6%

The following lake storage curve is used (Figure 3). The curve was developed based on available 1:20,000 mapping.

Figure 3. More Creek Reservoir Storage Curve



The 30 m of available storage is equivalent to approximately 90 days of storage at the design flow. The simple operation of the plant would dictate that excess water is stored during the summer months and used in the fall and winter months.

However, this operation assumes that the electricity price is the same throughout the year. Since at this stage, the electricity pricing scheme is not known, the model used the current BC Standing Offer Program (SOP) monthly delivery time adjustments to vary the electricity price through the year.

The model used monthly targets for the design flow to simulate the operation of the plant and maximize the average annual generation and revenue. Our preliminary analysis determined that the following monthly targets for the design flow resulted in the maximum generation at the plant:

Table 2. Monthly targets for turbine flow

	Flow (m <sup>3</sup> /s)
Jan	80
Feb	80
Mar	70
Apr	40
May	45
Jun	35
Jul	45
Aug	60
Sep	80
Oct	70
Nov	70
Dec	80

The resulting monthly and annual generation estimates are shown in Table 3 below:

Table 3. Generation estimates (GWh)

	1974	1975	1977	1978	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Average
Jan	52.7	25.1	2.7	20.9	20.8	48.3	46.2	37.1	10.9	2.7	8.1	35.5	28.1	25.2	45.7	45.1	46.0	23.7	46.6	30.1
Feb	46.4	1.3	2.7	1.3	2.7	31.1	9.6	0.0	1.3	0.0	1.3	1.3	2.7	6.8	4.0	10.9	2.7	12.4		7.3
Mar	41.3	2.3	2.3	1.2	1.2	2.3	1.2	1.2	2.3	3.5	1.2	1.2	1.2	2.3	1.2	5.9	1.2	3.5		4.1
Apr	20.9	1.3	4.7	2.7	4.0	3.4	1.3	4.7	2.7	0.7	2.7	4.0	4.7	4.0	5.4	4.7	7.4	6.7	6.1	4.9
May	13.6	15.9	21.3	15.9	21.5	20.8	9.8	21.3	20.7	13.0	14.4	15.2	22.4	19.7	20.7	22.4	18.3	23.6	22.2	18.6
Jun	18.2	18.7	18.9	19.0	20.2	19.7	19.1	19.7	18.9	19.1	19.0	18.6	19.4	19.5	19.8	19.7	19.9	21.3	19.1	19.4
Jul	25.9	29.0	28.1	28.0	30.0	28.7	29.1	29.1	27.7	28.7	28.7	28.1	28.5	29.1	29.3	29.5	30.8	30.5	28.2	28.8
Aug	36.6	40.8	40.8	40.0	41.8	40.9	41.2	40.5	39.8	40.8	40.9	39.9	40.3	41.2	41.5	41.3	42.0	42.0	40.3	40.7
Sep	48.7	52.2	53.6	51.9	53.8	54.0	53.7	53.0	51.8	52.7	52.5	51.7	52.9	54.1	54.2	54.0	53.4	53.8	53.1	52.9
Oct	45.1	45.2	47.1	46.1	48.8	48.2	47.8	46.3	45.2	46.5	46.9	46.7	46.9	48.4	48.3	48.4	47.0	47.7	48.3	47.1
Nov	43.3	41.0	43.7	43.5	46.2	45.4	44.7	42.8	41.1	42.7	44.6	43.5	43.7	45.2	45.1	45.4	43.6	45.7	45.2	44.0
Dec	47.6	32.7	47.5	47.3	52.2	50.9	49.2	46.2	34.2	45.9	49.0	48.0	47.8	50.4	50.1	50.6	47.7	51.1	50.2	47.3
Annual	440.3	305.6	313.4	317.8	343.1	393.8	352.9	342.0	295.5	295.1	310.3	333.7	337.1	340.7	369.1	366.5	372.8	350.0	375.1	345.0

If an electricity price of \$100/MWh is assumed the same throughout the year, then the average annual revenue would be \$34.5 million. Note the lowest and highest annual revenue are \$29.5 and \$44.0 million respectively.

Applying the current BC Hydro monthly delivery adjustment factors, the average annual revenue would be about \$34.8 million, ranging from \$29.8 to \$44.4 million.

Note that if the electricity price variance through the year is different from that of the current SOP, the monthly target for the turbine flow may differ from the ones shown above. Also, the impact of any monthly variation of electricity prices may vary depending on price variance and plant operation.

### Impact on Forest Kerr hydro project

The operation of the More Creek hydro project would potentially increase the generation of the existing Forrest Kerr project, located downstream from the More Creek powerhouse. The storage of water during the summer months, when Forrest Kerr would typically be spilling water, and the subsequent release of the stored water over the winter months would increase the Forrest Kerr generation potential.

The operational details of the Forrest Kerr project are not available to us. A high level estimate of the potential additional generation at Forrest Kerr is based on converting the additional flow (m<sup>3</sup>/s) to power (MW) using a factor of 0.80. The additional average annual generation at the Forrest Kerr project, using the above assumptions, is estimated at about 149 GWh.

## 4. CONSTRUCTION COST ESTIMATE

A prefeasibility cost estimate for the project has been developed based on the existing conceptual level design and layout. Any consideration of additional design options or optimizations is outside the scope of this study.

Sigma has attempted to indicate potential areas for future consideration. The geotechnical characteristics in the area of the proposed dam will have a considerable impact on the selected type of dam and the associated cost. The access to the project area is from an existing road and bridges over Iskut River which is shown on online mapping. It appears that the road may be subject to seasonal flooding. For the purposes of this study, it is assumed that the road will be accessible and that technical issues will be addressed in future studies.

The attached Table 4 shows the prefeasibility construction cost estimate for the project.

Table 4. Prefeasibility Cost Estimate

ACTIVITY	Qty Unit	Unit Cost	Total	SubTotal	Contingency %	Contingency \$	Total
<b>A Access Roads</b>							
Access Road to Power House	0.5 km	165,000	82,500				
Access Road, Powerhouse to Intake	1 km	600,000	600,000	682,500	20%	136,500	819,000
<b>B Intake Structure</b>							
Clearing, Grubbing, Stripping	2.50 ha	100,000	250,000				
Roller Compacted Concrete	335,000 m <sup>3</sup>	275	92,125,000				
Reinforced Concrete	6,500 m <sup>3</sup>	1,800	11,700,000				
Trashracks	280 m <sup>2</sup>	2,000	560,000				
Radial Gates	300 m <sup>2</sup>	10,000	3,000,000				
Intake gate	36 m <sup>2</sup>	10,000	360,000				
Diversion	1 ls	3,500,000	3,500,000				
Control Building	1 ls	100,000	100,000				
Power supply to intake area	1,000 m	250	250,000	111,845,000	20%	22,369,000	134,214,000
<b>C Tunneling</b>							
Main Tunnel (1,000m), Diversion Tunnel (200m)	1 ls	19,300,000	19,300,000	19,300,000	15%	2,895,000	22,195,000
<b>D Powerhouse Structural</b>							
Concrete foundation and terminal anchor block	1 ls	14,000,000	14,000,000				
Building with Crane- supply and install	1 ls	4,500,000	4,500,000	18,500,000	15%	2,775,000	21,275,000
<b>E Powerhouse Generation Equipment</b>							
Turbines, Generators, TIV and Bifurcation	1 ls	11,774,000	11,774,000				
Mechanical Installation	1 ls	500,000	500,000				
Balance of Plant	1 ls	15,000,000	15,000,000	27,274,000	10%	2,727,400	30,001,400
<b>F Transmission Line</b>							
3 phase 287kV to Bob Quinn	13 km	450,000	5,850,000				
BCH Interconnection Fee	1 ls	8,000,000	8,000,000	13,850,000	20%	2,555,000	16,405,000
<b>G Work Camp</b>							
Work Camp	55,000 Man-Days	200	11,000,000	11,000,000	20%	2,200,000	13,200,000
<b>TOTAL CONSTRUCTION COSTS</b>				<b>202,451,500</b>		<b>35,657,900</b>	<b>238,109,400</b>

## General Comments

### A. Access Roads

Pricing based on recent project built on Vancouver Island.

### B. Intake Structure

Reinforced concrete pricing based on pricing for recent projects. Pricing for Roller Compacted Concrete (RCC) was developed with input from contractors with RCC experience.

An earthfill dam or arch type dam may be an option in the confined portions of the canyon.

Pricing for trashracks, intake gate is based on price per square foot from a recent project.

Radial gate pricing based on square foot pricing of smaller gates.

Power supply to intake area assumed typical 25 kV line costs.

### C. Tunneling

The 1,000m long penstock tunnel is 5.5m x 5.5m. The 200m long diversion tunnel is 12m x 12m. Cost for the two tunnels is based on a cost estimate provided to Sigma by CanMine Contracting LP.

### D. Powerhouse Structural

Cost estimates are prorated from actual costs for small plants, with an adjustment for economy of scale.

### E. Powerhouse Generation Equipment

Cost estimate for generating equipment is based on quote from Chongqing Yunhe Hydropower Inc. plus an allowance for \$1 million for trifurcation. The turbine quote was for 3 horizontal Francis units with generators and a bypass valve to meet environmental criteria.

Balance of plant cost estimate is based on prorated cost of smaller plants discounted by 25% for economy of scale. Balance of plant includes all electrical items not in Turbine-Generator package. Includes controls, switchgear, transformers, grounding, plant wiring, etc.

### F. Transmission Line

Cost estimate for 3 phase 287 kV line to Bob Quinn is based on unit cost of 69kV line for a recent project, increased for voltage.

An allowance is made for the BCH interconnection price which is very difficult to estimate at this stage.

## G. Work Camp

Pricing per man-day is based on quote from full service camp provider. Estimate of number of man-days is based on the total project construction cost.

## Limitations

The estimates presented in Table 4 do not include or allow costs for the following:

- Possible fish screens
- Trashrack automatic racking
- A seepage blanket, or grouting, to prevent leakage around the dam
- Plunge pool construction for spillway (may be required depending on site conditions)
- Wildlife and First Nations compensation
- Clearing of reservoir. It is assumed to be zero (trees sold for value equal to clearing cost)
- Potential relocation of a Nova Gold (Galore Creek) road that may be flooded. This road may not be needed beyond the More Creek dam location, unless the mine project is restarted.

## 5. FINANCIAL ANALYSIS

The financial analysis of the project is based on a 40-year period. Sigma used a spreadsheet financial analysis model that has been developed and used for hydroelectric projects in BC. The analysis takes into account the estimated construction costs and escalating annual operating costs (O&M, administration, property/liability insurance, water rent, property and school taxes).

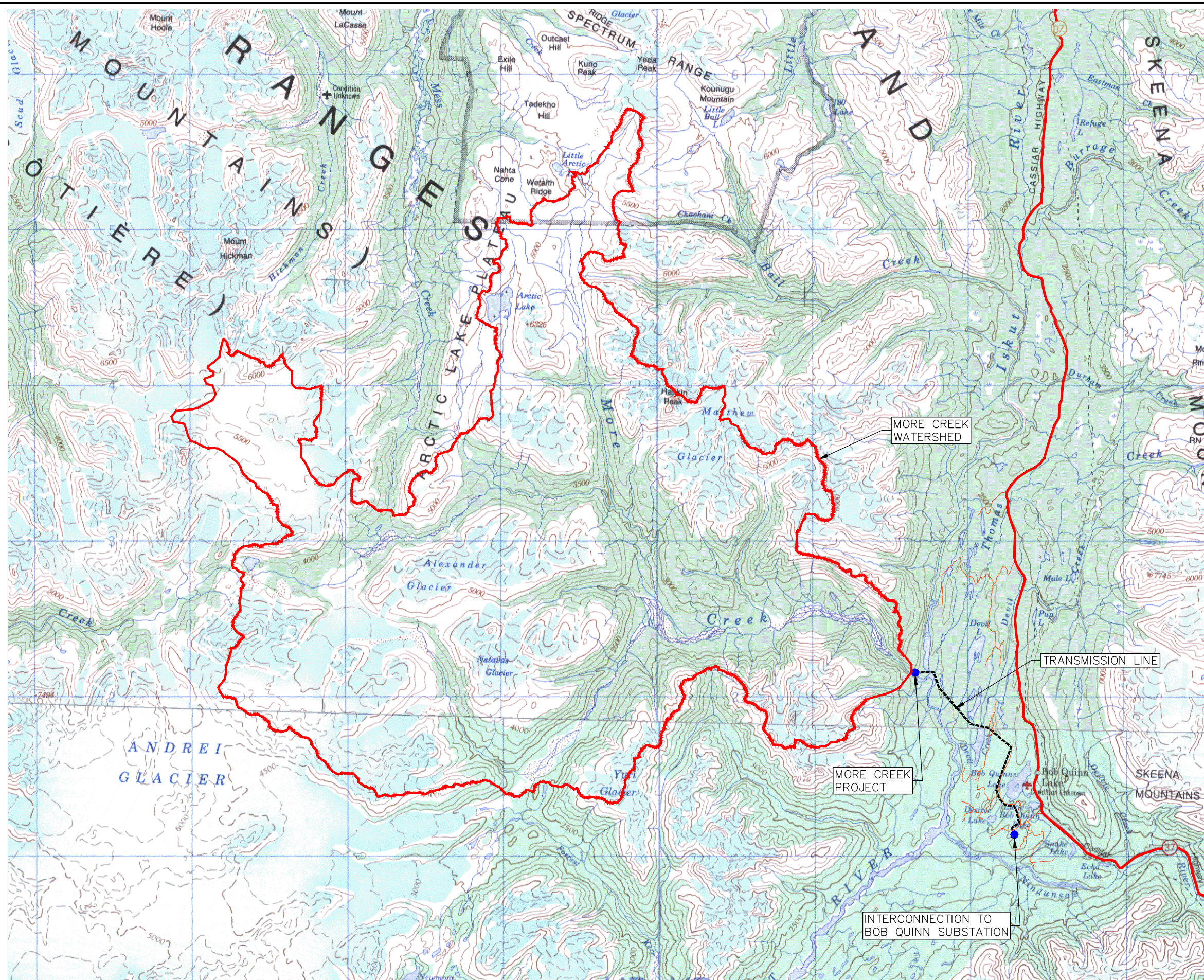
The analysis does not include any land acquisition and permitting costs, royalty payments or wheeling fees. The analysis indicates the expected net present value (NPV) and internal rate of return (IRR) for the project (see Appendix A).

### Assumptions

- The annual gross generation from Table 3 is used.
- The construction cost from the previous sections is used.
- The capital cost of the project includes cost estimates for Project Management, Engineering and Finance costs, expressed as a percentage of the construction cost. The estimates are based on typical costs for hydroelectric project in BC. The capital cost also includes an inflation adjustment from 2015 to 2017.
- The annual operating costs include the following, all adjusted annually for inflation:
  - Administration and Operation and Maintenance Cost as 1% of the Capital Cost
  - Insurance cost. Based on typical industry rates, which need to be confirmed by insurance professionals.
  - Water Rent based on 2014 rates.

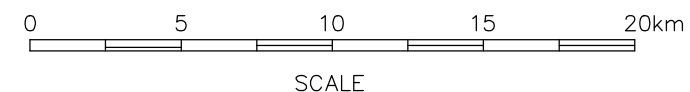


- Property and School Taxes. Typical BC rates are used which will need to be confirmed at a later stage.
- The analysis assumes 20% equity, 25 year amortization, an effective interest rate of 5.5% and an electricity price of \$100/MWh.

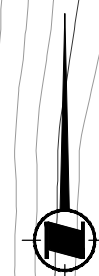
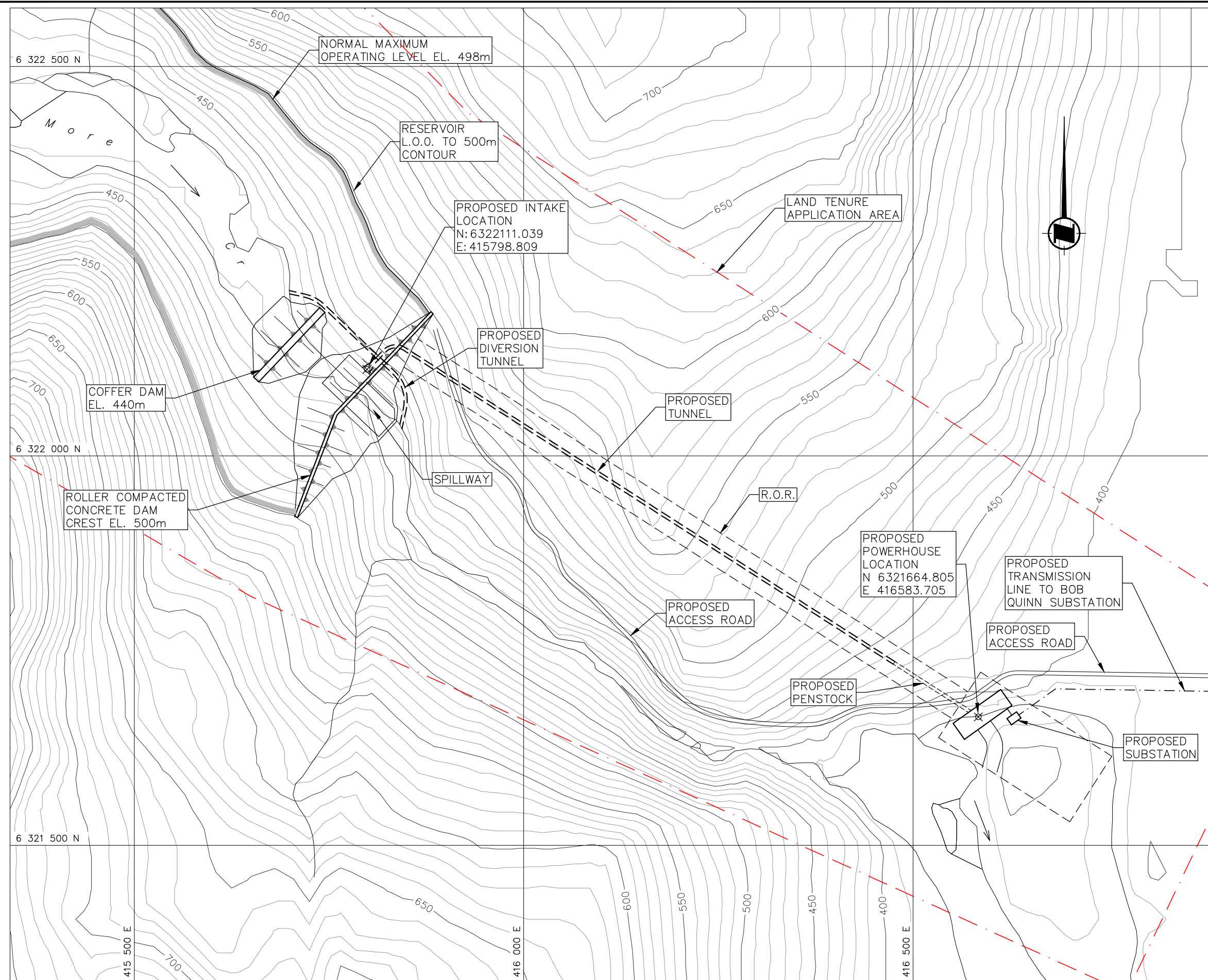


**NOTES**

1. BASE MAP FROM NTS 104B ISKUT RIVER & 104G TELEGRAPH CREEK, ORIGINAL SCALE 1:250,000
2. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

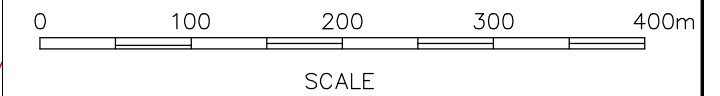


<b>SIGMA ENGINEERING LTD</b>	
<b>ALASKA HYDRO CORPORATION MORE CREEK HYDROELECTRIC PROJECT</b>	
<b>LOCATION PLAN &amp; WATERSHED</b>	
DATE	JUN 15
PROJ.	E6348
DWN.	ND/DGC
DWG.	FIGURE 1



**NOTES**

1. CONTOURS FROM BMGS, ILMB, CANADIAN DIGITAL ELEVATION DATA, GEOBASE 1.0; SOURCE DATA = BC-TRIM; SOURCE SCALE = 1:20,000; CONTOUR INTERVAL SHOWN = 10m
2. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0-CL4-NC4; SOURCE DATA = BC-TRIM; SOURCE SCALE = 1:20,000
3. COORDINATE SYSTEM = UTM ZONE 9, NAD 83



<b>SIGMA ENGINEERING LTD</b>	
<b>ALASKA HYDRO CORPORATION MORE CREEK HYDROELECTRIC PROJECT</b>	
<b>GENERAL ARRANGEMENT</b>	
DATE	AUG 14
PROJ.	E6348
DWN.	DGC
DWG.	FIGURE 2

**APPENDIX A**  
**Financial Analysis**

ALASKA HYDRO CORPORATION - MORE CREEK HYDRO PROJECT  
 PRELIMINARY FINANCIAL ANALYSIS FOR POWER SALES

BASIC PARAMETERS

Table 1

**POWER PRODUCTION DETAILS**

Gross Head 118m, Design Flow 80 m <sup>3</sup> /s		
Base Case IFR 5% of MAF (2.476m <sup>3</sup> /s)		
Hydro Power Plant Rated Cap:	<b>75,255</b>	kW
Max Power Supplied to BCH	75,255	kW
Power Plant Load Factor	50.3%	
Avg Annual Generation	37,822	kW
Net Annual Power Sales	<b>331.320</b>	GWh/yr
Gross Generation	<b>345.000</b>	GWh/yr
Daily vs Real time adjustment	<b>0.0%</b>	
Station Service	<b>200</b>	kW
Transformer/powerline losses	<b>2.5%</b>	
Outages (sched., unsch.)	<b>1.0%</b>	

**CAPITAL COST**

Access Roads	<b>682,500</b>	
Intake structure (incl.RCC)	<b>111,845,000</b>	
Tunneling	<b>19,300,000</b>	
Powerhouse	<b>18,500,000</b>	
Generation Equipment	<b>27,274,000</b>	
Transmission Line/Interconn.	<b>13,850,000</b>	
Work Camp	<b>11,000,000</b>	
Contingencies	<b>35,657,900</b>	238,109,400
Project Management	<b>4,762,188</b>	2%
Engineering, Consultants	<b>19,048,752</b>	8%
Finance Costs (incl IDC)	<b>21,429,846</b>	9%
Land and Permitting	<b>0</b>	283,350,186 (sub-total)
Inflation (2 yrs at 2.3%)	<b>13,184,001</b>	
=====		
Total Capital Cost in 2017 \$:	<b>\$296,534,187</b>	
Cost per Installed kW	<b>3,940</b>	

**LONG TERM PROJECT VALUE**

Hydro Plant Design Life	<b>40</b>	Years
Depreciation Rate	<b>2.5%</b>	per Year
Annual Book Depreciation	<b>\$7,413,355</b>	

**ANNUAL OPERATING COSTS**

**Admin., O&M as a Percent of Capital Cost**

Daily Admin., Operation & Maintenance	<b>incl</b>
Annual Overhaul & Equip. Repair	<b>1.00%</b>
First Year Total O & M Cost (incl. admin)	<b>\$2,965,342</b>
O & M Inflation Rate	<b>2.3%</b>

**Insurance**

Property Value for Insurance Purposes		
100% of Capital Cost	<b>\$296,534,187</b>	
Property Insurance	<b>1.50</b>	\$/1000
General Liability	<b>\$10,000,000</b>	
Liability Insurance	<b>6.00</b>	\$/1000
First Year Insurance	<b>\$504,801</b>	
Insurance Inflation Rate	<b>2.3%</b>	

**Water Rent**

Water Tax on Engy Produced (<160GWh)	<b>1.288</b>	\$/MWh
Water Tax on Engy Produced (>160GWh)	<b>6.006</b>	\$/MWh
Water Tax on Installed Capacity	<b>4.291</b>	\$/kW
First Year Water Rent	<b>\$1,557,948</b>	
Water Rent Inflation Rate	<b>2.3%</b>	
<i>(based on 2014 Rental Rates)</i>		

**Property and School Taxes**

Assessed Property Value		
45% of Capital Cost less Equip (est.)	<b>\$112,482,084</b>	
School Tax (est.)	<b>13.600</b>	\$/1000
Municipal & Property Tax (est.)	<b>11.054</b>	\$/1000
First Year Tax Assessment	<b>\$2,773,100</b>	
Tax Inflation Rate	<b>2.3%</b>	

**FINANCING DETAILS**

Total Capital Cost	<b>296,534,187</b>
Equity Input	<b>20.0%</b>
Equity Amount	<b>59,306,837</b>
Finance Amount	<b>237,227,349</b>
Amortization Period	<b>25</b> Years
Reference Interest Rate	<b>3.50%</b> Prime Rate
Interest Rate over Refer.	<b>2.00%</b>
Effective Interest Rate	<b>5.50%</b>
Annual Payment	<b>\$17,685,145</b>

**REVENUE DETAILS**

Energy Payment		
CPI (BC)		Price
		(cents/kWh)
<b>2017</b>	<b>100.0</b>	<b>10.00</b>
CPI rate		<b>2.30%</b>
Delivery Time adjustment		<b>1.019</b>

2017 EPA signing (effective date)

Internal Rate of Return	<b>16.85%</b>
Before Tax Cashflow Net Present Value @ 10%	<b>51,791,914</b>
Debt Service Coverage in Year 1	<b>1.47</b>

Last Revised 06-Jul-15  
 Spreadsheet by: CL

ALASKA HYDRO CORPORATION - MORE CREEK HYDRO PROJECT  
 PRELIMINARY FINANCIAL ANALYSIS FOR POWER SALES

OPERATING COSTS AND REVENUE

Table 2

OPERATING COSTS										REVENUE				
Proj Year	Calendar Year Beginning Jan 1	Operation and Maintenance	Insurance	Water Rent	Regional Taxes	Plant Operating Cost \$	Plant Operating Cost cents/kWh	Annual Operating Cost \$	Average Annual Generation kW	Annual Generation MWh	Revenue cents/kWh	Revenue \$		
		A	B	C	D	E	F	G	H	I	J	K	L	M
1	2017	2,965,342	504,801	1,557,948	2,773,100	7,801,191	2.35	7,801,191	37,822	331,320	10.19	33,764,835		
2	2018	3,033,545	516,412	1,593,781	2,836,881	7,980,618	2.41	7,980,618	37,822	331,320	10.31	34,153,130		
3	2019	3,103,316	528,289	1,630,438	2,902,129	8,164,172	2.46	8,164,172	37,822	331,320	10.43	34,550,357		
4	2020	3,174,693	540,440	1,667,938	2,968,878	8,351,948	2.52	8,351,948	37,822	331,320	10.55	34,956,719		
5	2021	3,247,710	552,870	1,706,300	3,037,162	8,544,043	2.58	8,544,043	37,822	331,320	10.68	35,372,428		
6	2022	3,322,408	565,586	1,745,545	3,107,017	8,740,556	2.64	8,740,556	37,822	331,320	10.80	35,797,698		
7	2023	3,398,823	578,594	1,785,693	3,178,478	8,941,589	2.70	8,941,589	37,822	331,320	10.94	36,232,750		
8	2024	3,476,996	591,902	1,826,764	3,251,583	9,147,245	2.76	9,147,245	37,822	331,320	11.07	36,677,808		
9	2025	3,556,967	605,516	1,868,779	3,326,370	9,357,632	2.82	9,357,632	37,822	331,320	11.21	37,133,102		
10	2026	3,638,777	619,443	1,911,761	3,402,876	9,572,857	2.89	9,572,857	37,822	331,320	11.35	37,598,867		
11	2027	3,722,469	633,690	1,955,732	3,481,142	9,793,033	2.96	9,793,033	37,822	331,320	11.49	38,075,346		
12	2028	3,808,086	648,265	2,000,714	3,561,209	10,018,273	3.02	10,018,273	37,822	331,320	11.64	38,562,783		
13	2029	3,895,672	663,175	2,046,730	3,643,117	10,248,693	3.09	10,248,693	37,822	331,320	11.79	39,061,431		
14	2030	3,985,272	678,428	2,093,805	3,726,908	10,484,413	3.16	10,484,413	37,822	331,320	11.94	39,571,549		
15	2031	4,076,934	694,032	2,141,962	3,812,627	10,725,555	3.24	10,725,555	37,822	331,320	12.10	40,093,399		
16	2032	4,170,703	709,994	2,191,227	3,900,318	10,972,242	3.31	10,972,242	37,822	331,320	12.26	40,627,251		
17	2033	4,266,629	726,324	2,241,626	3,990,025	11,224,604	3.39	11,224,604	37,822	331,320	12.43	41,173,382		
18	2034	4,364,762	743,030	2,293,183	4,081,795	11,482,770	3.47	11,482,770	37,822	331,320	12.60	41,732,075		
19	2035	4,465,151	760,119	2,345,926	4,175,677	11,746,874	3.55	11,746,874	37,822	331,320	12.77	42,303,617		
20	2036	4,567,850	777,602	2,399,882	4,271,717	12,017,052	3.63	12,017,052	37,822	331,320	12.94	42,888,304		
21	2037	4,672,910	795,487	2,455,080	4,369,967	12,293,444	3.71	12,293,444	37,822	331,320	13.13	43,486,440		
22	2038	4,780,387	813,783	2,511,547	4,470,476	12,576,193	3.80	12,576,193	37,822	331,320	13.31	44,098,332		
23	2039	4,890,336	832,500	2,569,312	4,573,297	12,865,446	3.88	12,865,446	37,822	331,320	13.50	44,724,298		
24	2040	5,002,814	851,648	2,628,406	4,678,483	13,161,351	3.97	13,161,351	37,822	331,320	13.69	45,364,662		
25	2041	5,117,879	871,236	2,688,860	4,786,088	13,464,062	4.06	13,464,062	37,822	331,320	13.89	46,019,753		
26	2042	5,235,590	891,274	2,750,703	4,896,168	13,773,735	4.16	13,773,735	37,822	331,320	14.09	46,689,912		
27	2043	5,356,008	911,773	2,813,970	5,008,780	14,090,531	4.25	14,090,531	37,822	331,320	14.30	47,375,484		
28	2044	5,479,197	932,744	2,878,691	5,123,982	14,414,613	4.35	14,414,613	37,822	331,320	14.51	48,076,825		
29	2045	5,605,218	954,197	2,944,901	5,241,833	14,746,150	4.45	14,746,150	37,822	331,320	14.73	48,794,296		
30	2046	5,734,138	976,144	3,012,634	5,362,395	15,085,311	4.55	15,085,311	37,822	331,320	14.95	49,528,269		
31	2047	5,866,023	998,595	3,081,924	5,485,731	15,432,273	4.66	15,432,273	37,822	331,320	15.18	50,279,124		
32	2048	6,000,942	1,021,563	3,152,808	5,611,902	15,787,215	4.76	15,787,215	37,822	331,320	15.41	51,047,248		
33	2049	6,138,963	1,045,059	3,225,323	5,740,976	16,150,321	4.87	16,150,321	37,822	331,320	15.64	51,833,039		
34	2050	6,280,160	1,069,095	3,299,505	5,873,019	16,521,779	4.99	16,521,779	37,822	331,320	15.89	52,636,904		
35	2051	6,424,603	1,093,684	3,375,394	6,008,098	16,901,780	5.10	16,901,780	37,822	331,320	16.14	53,459,257		
36	2052	6,572,369	1,118,839	3,453,028	6,146,284	17,290,521	5.22	17,290,521	37,822	331,320	16.39	54,300,524		
37	2053	6,723,534	1,144,572	3,532,448	6,287,649	17,688,203	5.34	17,688,203	37,822	331,320	16.65	55,161,141		
38	2054	6,878,175	1,170,898	3,613,694	6,432,265	18,095,031	5.46	18,095,031	37,822	331,320	16.91	56,041,551		
39	2055	7,036,373	1,197,828	3,696,809	6,580,207	18,511,217	5.59	18,511,217	37,822	331,320	17.19	56,942,211		
40	2056	7,198,210	1,225,378	3,781,836	6,731,552	18,936,975	5.72	18,936,975	37,822	331,320	17.46	57,863,587		
TOTALS		191,235,934	32,554,811	100,472,606	178,838,160	0	503,101,511	2.95	503,101,511	37,822	331,320	11.47	1,764,049,690	

ALASKA HYDRO CORPORATION - MORE CREEK HYDRO PROJECT  
PRELIMINARY FINANCIAL ANALYSIS FOR POWER SALES

CASH FLOW

Table 3

Proj Year	Calendar Year Beginning Jan 1	Interest	Capital Repayment	Capital Balance	Project Book Value	Annual Operating Cost \$	Total Annual Cost \$	Total Annual Cost cents/kWh	Total Annual Revenue \$	Before Tax Cash Flow	Annual Income
		A	B	C	D	E	F	G	H	I	J
				237,227,349						-59,306,837	0
1	2017	13,047,504	4,637,641	232,589,708	296,534,187	7,801,191	25,486,336	7.69	33,764,835	8,278,499	5,502,785
2	2018	12,792,434	4,892,711	227,696,997	289,120,832	7,980,618	25,665,763	7.75	34,153,130	8,487,367	5,966,724
3	2019	12,523,335	5,161,811	222,535,186	281,707,477	8,164,172	25,849,318	7.80	34,550,357	8,701,039	6,449,495
4	2020	12,239,435	5,445,710	217,089,476	274,294,123	8,351,948	26,037,094	7.86	34,956,719	8,919,626	6,951,981
5	2021	11,939,921	5,745,224	211,344,252	266,880,768	8,544,043	26,229,188	7.92	35,372,428	9,143,240	7,475,109
6	2022	11,623,934	6,061,212	205,283,040	259,467,413	8,740,556	26,425,701	7.98	35,797,698	9,371,997	8,019,854
7	2023	11,290,567	6,394,578	198,888,462	252,054,059	8,941,589	26,626,734	8.04	36,232,750	9,606,016	8,587,239
8	2024	10,938,865	6,746,280	192,142,182	244,640,704	9,147,245	26,832,391	8.10	36,677,808	9,845,417	9,178,342
9	2025	10,567,820	7,117,325	185,024,857	237,227,349	9,357,632	27,042,777	8.16	37,133,102	10,090,324	9,794,295
10	2026	10,176,367	7,508,778	177,516,078	229,813,995	9,572,857	27,258,003	8.23	37,598,867	10,340,864	10,436,288
11	2027	9,763,384	7,921,761	169,594,317	222,400,640	9,793,033	27,478,179	8.29	38,075,346	10,597,167	11,105,573
12	2028	9,327,687	8,357,458	161,236,859	214,987,285	10,018,273	27,703,418	8.36	38,562,783	10,859,365	11,803,468
13	2029	8,868,027	8,817,118	152,419,741	207,573,931	10,248,693	27,933,839	8.43	39,061,431	11,127,593	12,531,356
14	2030	8,383,086	9,302,060	143,117,682	200,160,576	10,484,413	28,169,559	8.50	39,571,549	11,401,990	13,290,695
15	2031	7,871,472	9,813,673	133,304,009	192,747,221	10,725,555	28,410,700	8.57	40,093,399	11,682,699	14,083,017
16	2032	7,331,720	10,353,425	122,950,584	185,333,867	10,972,242	28,657,388	8.65	40,627,251	11,969,863	14,909,934
17	2033	6,762,282	10,922,863	112,027,721	177,920,512	11,224,604	28,909,749	8.73	41,173,382	12,263,633	15,773,142
18	2034	6,161,525	11,523,621	100,504,100	170,507,157	11,482,770	29,167,915	8.80	41,732,075	12,564,159	16,674,425
19	2035	5,527,725	12,157,420	88,346,680	163,093,803	11,746,874	29,432,019	8.88	42,303,617	12,871,598	17,615,663
20	2036	4,859,067	12,826,078	75,520,602	155,680,448	12,017,052	29,702,197	8.96	42,888,304	13,186,107	18,598,831
21	2037	4,153,633	13,531,512	61,989,090	148,267,093	12,293,444	29,978,589	9.05	43,486,440	13,507,850	19,626,008
22	2038	3,409,400	14,275,745	47,713,344	140,853,739	12,576,193	30,261,339	9.13	44,098,332	13,836,994	20,699,385
23	2039	2,624,234	15,060,911	32,652,433	133,440,384	12,865,446	30,550,591	9.22	44,724,298	14,173,707	21,821,264
24	2040	1,795,884	15,889,262	16,763,171	126,027,029	13,161,351	30,846,496	9.31	45,364,662	14,518,165	22,994,072
25	2041	921,974	16,763,171	0	118,613,675	13,464,062	31,149,207	9.40	46,019,753	14,870,546	24,220,362
26	2042	0	0	0	111,200,320	13,773,735	13,773,735	4.16	46,689,912	32,916,177	25,502,822
27	2043	0	0	0	103,786,965	14,090,531	14,090,531	4.25	47,375,484	33,284,953	25,871,598
28	2044	0	0	0	96,373,611	14,414,613	14,414,613	4.35	48,076,825	33,662,211	26,248,857
29	2045	0	0	0	88,960,256	14,746,150	14,746,150	4.45	48,794,296	34,048,147	26,634,792
30	2046	0	0	0	81,546,901	15,085,311	15,085,311	4.55	49,528,269	34,442,958	27,029,604
31	2047	0	0	0	74,133,547	15,432,273	15,432,273	4.66	50,279,124	34,846,851	27,433,496
32	2048	0	0	0	66,720,192	15,787,215	15,787,215	4.76	51,047,248	35,260,033	27,846,678
33	2049	0	0	0	59,306,837	16,150,321	16,150,321	4.87	51,833,039	35,682,718	28,269,363
34	2050	0	0	0	51,893,483	16,521,779	16,521,779	4.99	52,636,904	36,115,125	28,701,770
35	2051	0	0	0	44,480,128	16,901,780	16,901,780	5.10	53,459,257	36,557,477	29,144,123
36	2052	0	0	0	37,066,773	17,290,521	17,290,521	5.22	54,300,524	37,010,004	29,596,649
37	2053	0	0	0	29,653,419	17,688,203	17,688,203	5.34	55,161,141	37,472,938	30,059,583
38	2054	0	0	0	22,240,064	18,095,031	18,095,031	5.46	56,041,551	37,946,520	30,533,165
39	2055	0	0	0	14,826,709	18,511,217	18,511,217	5.59	56,942,211	38,430,994	31,017,640
40	2056	0	0	0	7,413,355	18,936,975	18,936,975	5.72	68,983,619	50,046,644	42,633,289
TOTALS		204,901,286	237,227,349			503,101,511	945,230,146	8.29	1,775,169,722	829,939,576	770,632,738

Net Present Value @ 10% 51,791,914  
Internal Rate of Return 16.85% #DIV/0!

Note: Sale for 1.5 x book value assumed in Year 40