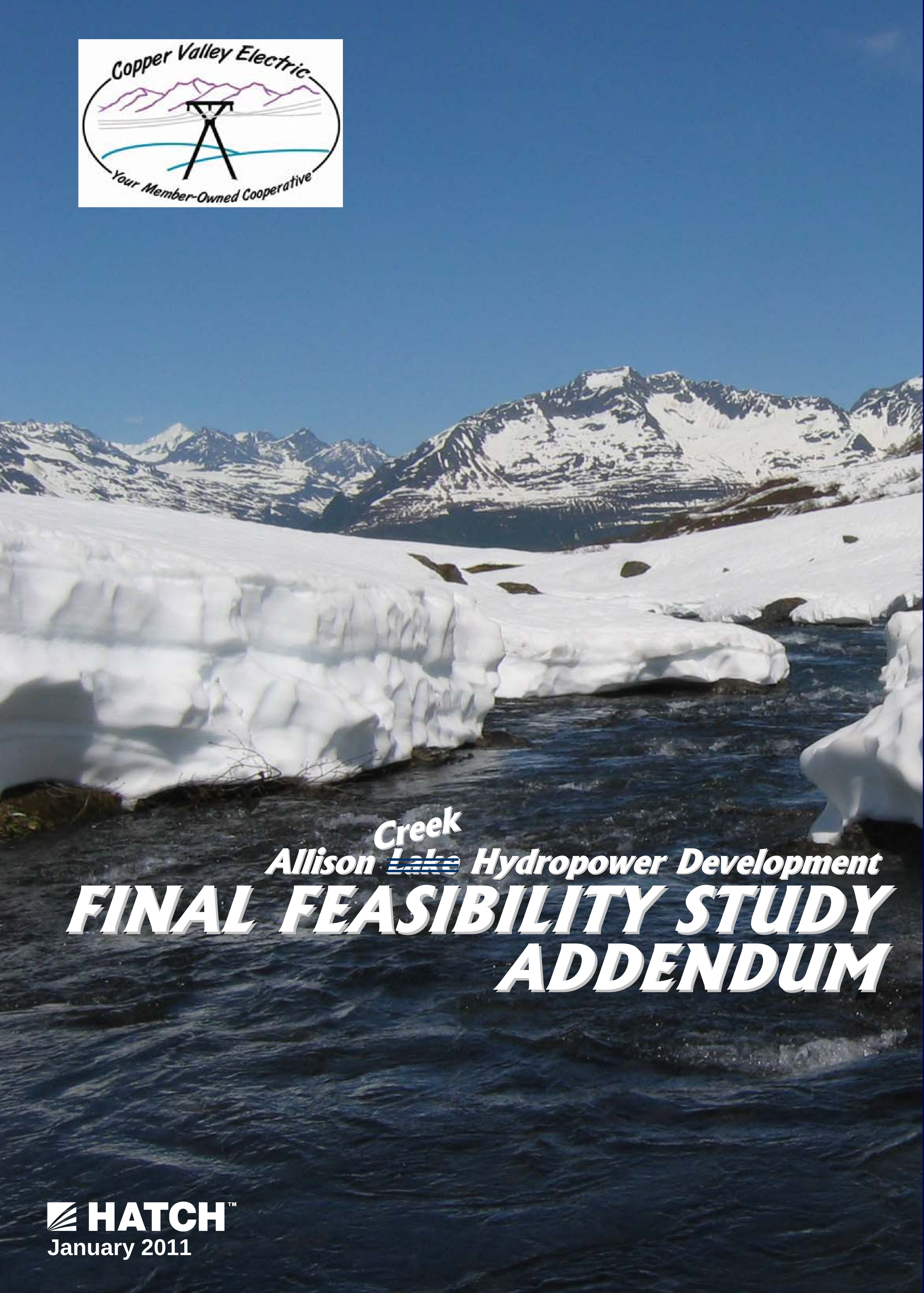


Allison ~~Lake~~ Creek Hydropower Development

FINAL FEASIBILITY STUDY ADDENDUM

HATCH™

January 2011

Hatch Acres Corporation
6 Nickerson Street, Suite 101, Seattle, WA 98109 USA
Tel: 206-352-5730 • Fax: 206-352-5734 • www.hatchusa.com

Robert A. Wilkinson, CEO
Copper Valley Electric Association
P.O. Box 45
Glennallen, AK 99588-2832

January 10, 2011
H-327730

Dear Robert: **Subject:** **Allison Creek Hydroelectric Project**
Final Feasibility Study – Addendum

We are pleased to submit herewith our **Addendum** to the **Final Feasibility Study** (**FFS**) for the Allison Lake Hydroelectric Project. The **FFS** presented our analysis of six technically feasible arrangements for the project. This **Addendum** presents our analysis of two additional options for the project. Together these documents comprise the results of Hatch's study of the feasibility for hydropower development of the Allison Creek basin.

- **Alternative 4a** (**Alt 4a**): A run-of-river development on Allison Creek commencing approximately 2,000 downstream of the outlet of Allison Lake consisting of a diversion structure and a penstock leading to a 6.5 MW powerhouse at the same location as considered for **Alt 3c**.
- **Alternative 4b** (**Alt 4b**): The addition of an inflatable gate on the Solomon Gulch Spillway that would raise the normal maximum water surface of Solomon Lake by five feet.

Our principal conclusions for these two alternatives as stated within the report include:

- **Alternative 4a**
  - A run-of-river **Alt 4a** development of the Allison Creek basin is not cost effective with operation within the Copper Valley Electric Association, Inc.'s (CVEA) existing system load.
  - With the addition of 2 MW to the CVEA system load, the project would be competitive with the cost of diesel generation.
  - The reduced scale of the hydropower development of the Allison Creek basin as offered by **Alt 4a** would reduce the risk of construction cost overruns, seepage and dam safety concerns and environmental impacts as compared to **Alt 3c**.
  - **Alt 4a** is superior to **Alt 3c** in all respects.
- **Alternative 4b**
  - The addition of inflatable gates to the Solomon Gulch Spillway as proposed for **Alt 4b** would add approximately 2 GWh of energy to the CVEA system.
  - The addition of inflatable gates to the Solomon Gulch Spillway as proposed for **Alt 4b** would require amendment to existing FERC License for the Solomon Gulch Project.
  - On the basis of the energy potential and cost estimates prepared for this evaluation, **Alt 4b** currently would not be an economically viable project.

Based on these conclusions we recommend that the CVEA adopt **Alt 4a** as the preferred alternative for the development of the hydroelectric potential of the Allison Creek basin and that further consideration of **Alt 3c** and **Alt 4b** be terminated.

We greatly appreciate the opportunity to work with you on this interesting project. If you have any questions regarding the subject report, be sure to give us a call.

Yours very truly,

A. Richard Griffith

A. Richard Griffith, P.E.
Project Manager

Table of Contents

Tables

Figures

Appendices

1. Introduction

1.1 General

A fundamental premise of the studies leading to the Final Feasibility Study (**FFS**) for the Allison Lake Hydroelectric Project (Project) of May 2010 was that an additional hydropower project is needed to support the Solomon Gulch Project during winter months. Currently the Copper Valley Electric Association, Inc. (CVEA) must rely on diesel generation to meet system load to make up for the inability of the Solomon Gulch Project to generate during the winter period. The Allison Creek basin exhibits the same basic annual pattern of inflow as the Solomon Gulch basin. The 7 months of May through November are estimated to account for 98% of the annual inflow leaving only a 2% contribution for the 5 months of December through April. Accordingly, the focus of the **FFS** was to determine the most cost-effective manner to mobilize the potential storage capability of Allison Lake to allow for generation during the low-flow winter-time period. In all, six different schemes, **Alt 1**, **Alt 2** and **Alt 3a** through **Alt 3d**, were reviewed and reported on as part of the previous studies for the Project. The manner in the proposed design for each alternative provides the necessary storage is described in **Section 1.3** through **Section 1.5** of the **FFS**.

The Project studies have shown that each of the six arrangements are technically and environmentally feasible. However, the studies also reveal that each arrangement includes significant challenges potentially affecting their long term economics and/or operational reliability as listed in **Table 1.1**.

Table 1.1
Final Feasibility Report
Design and Economic Considerations

Alternative	Design and Economic Considerations
Alt 1	Tunnel cost
Alt 2	Tunnel cost
Alt 3a	Reliable operation of siphon and maintenance thereof during winter period, access
Alt 3b	Drilling of micro-tunnel in glacial moraine
Alt 3c	Embankment cost, foundation conditions for embankment, seepage, liquefaction & avalanches, access
Alt 3d	Embankment cost, foundation conditions for embankment, seepage, liquefaction & avalanches, access

Subsequent to the completion of the **FFS**, the range of challenges as summarized above led to a concern regarding the viability of a storage project within the Allison Creek drainage. However, the high elevation of the first 2000′ below the outlet of Allison Lake suggests that there would be a significant amount of energy available from Allison Creek as a run-of-river project.

To date, the system load characteristics of CVEA has been such that much of this additional energy would be stranded; i.e. there would be no load available for the project to serve. Recently, however, a 2 MW industrial facility has been brought into the CVEA system. This additional load will provide an opportunity to CVEA to more fully operate a run-of-river project to accommodate what would otherwise be served by diesel generation.

The purpose of this Addendum to the **FFS** dated May 2010, is to present the evaluation of the economic viability of alternative run-of-river arrangements for capturing the hydropower potential of

Allison Creek as a project to serve an expanded CVEA system load. This scheme is referred to as **Alt 4**. The scope of work leading to this Addendum to the **FFS** has included the following activities:

1. Development of alternative project arrangements consistent with the purposes of this Addendum.
2. Review of Allison Lake hydrology as related to the run-of-river hydropower potential of the identified alternatives.
3. Preliminary layout and cost estimate of hydroelectric project features for each of the identified project arrangements.
4. Economic evaluation of the identified alternatives.
5. Environmental review of the of the identified alternatives.
6. Preparation of this addendum to the Final Feasibility Report including the resulting conclusions and recommendations.

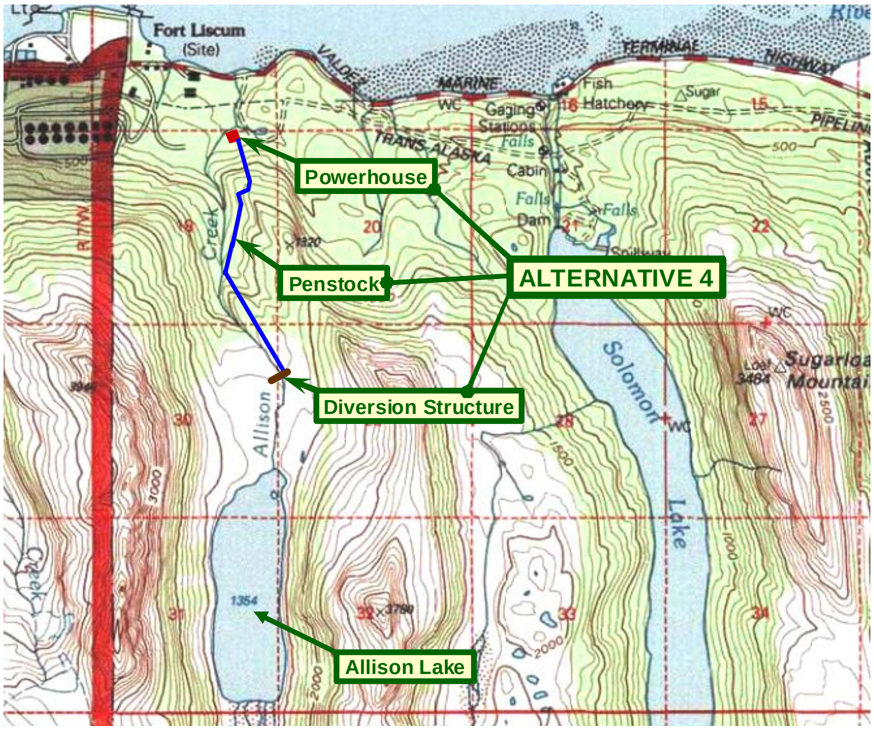
1.2 Alternative 4 – General Arrangement

The primary features of the run-of-river project selected for this review include the following:

- A low diversion structure on Allison Creek at El. 1300;
- A 42″ diameter surface / buried penstock;
- A 6.5 MW powerhouse along Allison Creek at El. 130 with a 1.75 mile transmission line leading to the Solomon Gulch switchyard; and
- A permanent 1,000 foot access road to the powerhouse and a temporary 4,500 foot trail for penstock construction access.

The general arrangement of these features for **Alt 4** is shown in **Figure 1.1.** Two versions of **Alt 4** are reviewed herein as described in the following paragraphs.

Figure 1.1
Alternative 4 General Arrangement

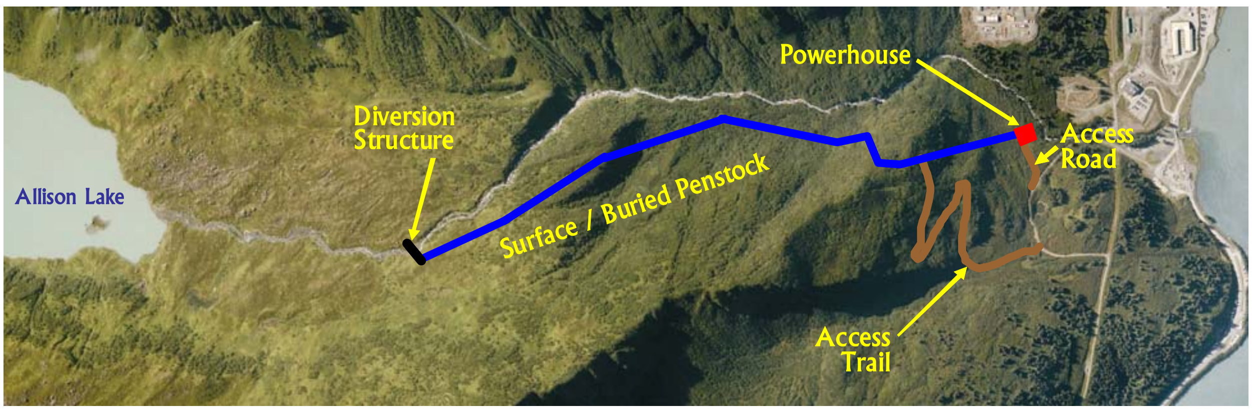


1.3 Alternative 4a – Diversion Structure on Allison Creek with Penstock leading to Powerhouse (Alt 4a)

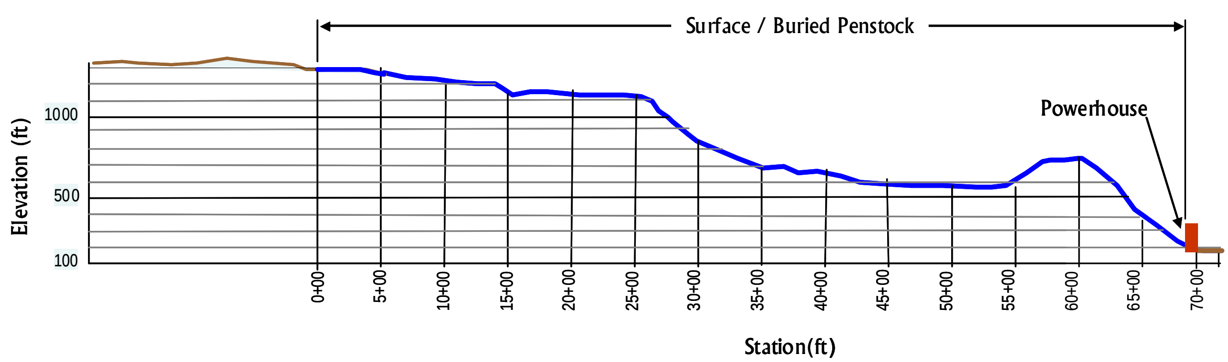
Alt 4a includes the primary features as described above. Plan and profile views of **Alt 4a** are shown in **Figure 1.2**. The general details of the penstock and powerhouse are shown on **Figures B.6** and **B.7** respectively within Appendix B of the **FFS**. The actual dimensions of the penstock and powerhouse will be in proportion to the 42″ penstock and 6.5 MW powerhouse as referenced above for **Alt 4** in lieu of the 36″ penstock and 4 MW powerhouse for **Alt 3c** as shown in the **FFS**.

The access road to the powerhouse as shown in **Figure 1.2** will be designed in accordance with the criteria set forth in Appendix C.3 of the **FFS**. The design of the access trail from the loop road off the Trans Alaska Pipeline System corridor to the point where the penstock crosses over a ridge will follow the same alignment to that point as was studied for the construction access for **Alt 3c**. However, the width of the corridor will be reduced consistent with the use of helicopters as the primary access for construction of the penstock and diversion structure.

Figure 1.2
Alternative 4a – Plan and Profile



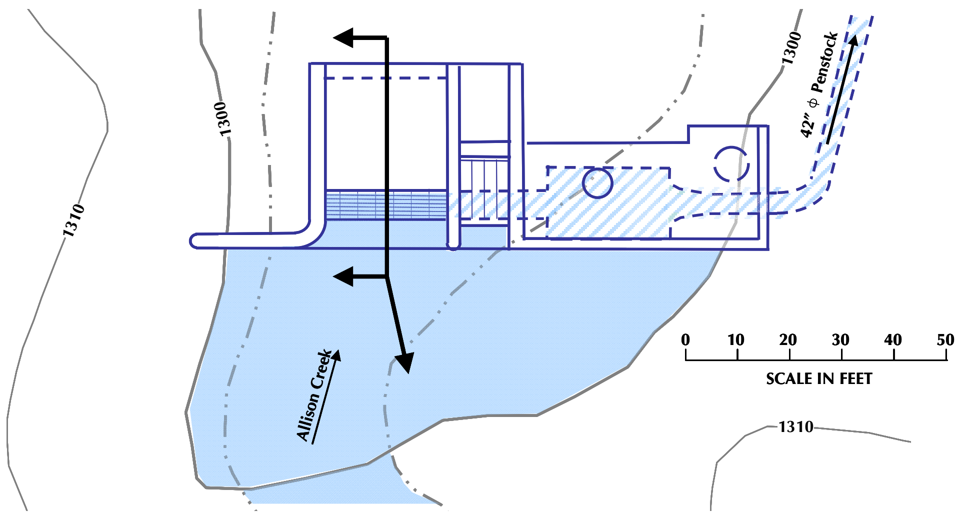
PLAN



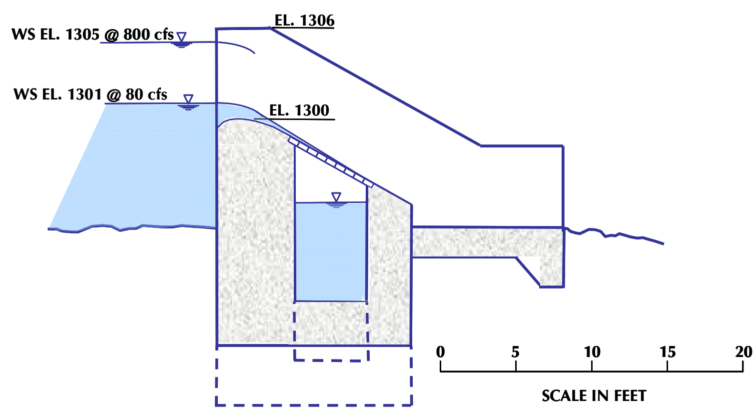
PROFILE

The diversion structure will be located along Allison Creek at approximately El. 1300. The specific location and type of diversion scheme to be used for the run-of-river option will be determined at the next level of the design process. A conceptual drawing of the type of diversion structure used for the present purpose is shown in **Figure 1.3**.

Figure 1.3
Diversion Structure – Plan and Cross Section



PLAN



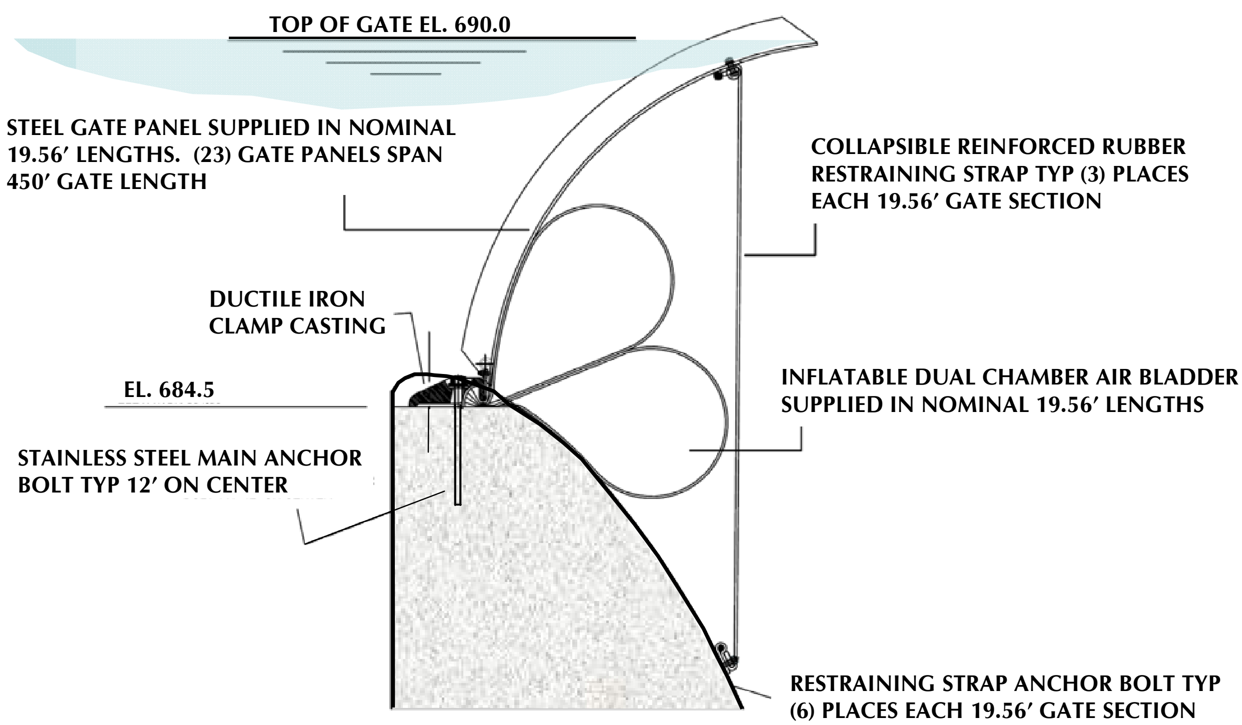
CROSS SECTION

1.4 Alternative 4b – Raising Solomon Gulch Reservoir Maximum Water Surface 5 feet with Inflatable Gates on Spillway (Alt 4b)

Alt 4b adds additional storage to the Solomon Gulch reservoir by modifying the spillway with 5 foot high inflatable gates extending the full length of the 450 foot long spillway. The proprietary Obermeyer Gate System, which consists of steel panels that are raised up by inflating a rubber bladder, has been selected for evaluation of **Alt 4b** on the basis that the rubber bladder gates without steel panels are not sufficiently controllable. They must be either in the fully inflated or fully deflated mode and can release too much water into the tailrace during the transition. The Obermeyer gates can operate at any stage between up or down thereby controlling water release. A typical Obermeyer gate installation and proposed profile view of **Alt 4b** are shown in **Figure 1.4** and **Figure 1.5**, respectively.

Figure 1.4
Typical Obermeyer Gate Installation

Figure 1.5
Solomon Gulch Obermeyer Spillway Gate Cross Section



2. Power Studies

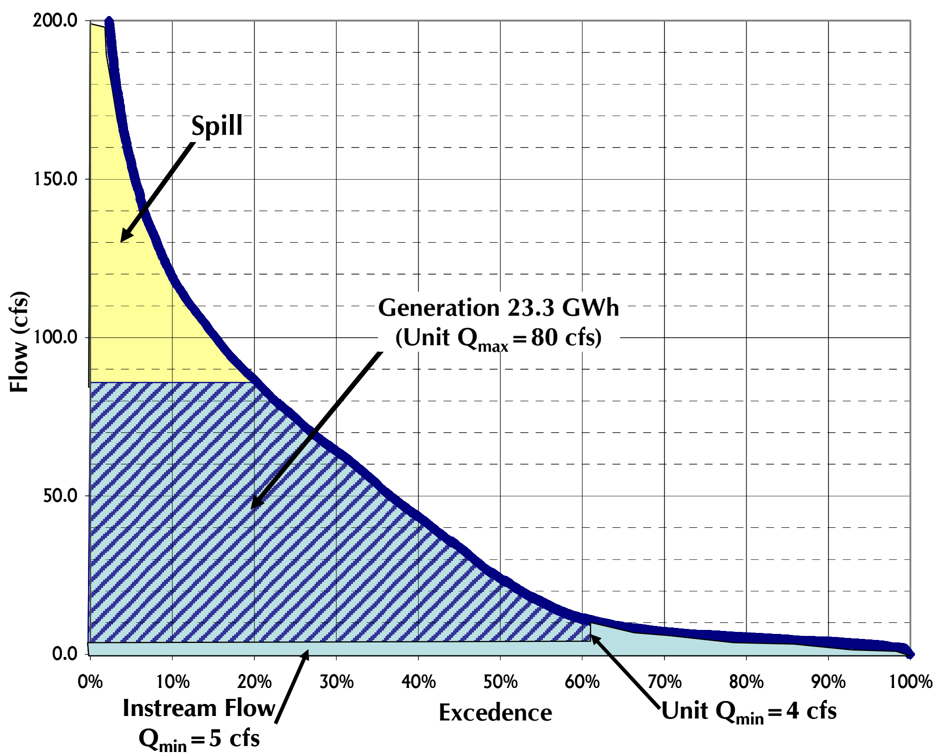
2.1 Unconstrained Run-of-River Operation

By definition, without a reservoir to regulate available flows at the intake, a hydropower project can only be operated when instantaneous flows are within the range of physical capability of the generating equipment. All flows greater than the maximum hydraulic capacity of the equipment will flow past the intake as spill. In addition, all flows required for other instream uses as well as all flows less than that required to operate the smallest hydropower unit at the site must be passed by the intake.

This condition is illustrated in **Figure 2.1** in the form of an annual flow duration curve for the run-of-river hydropower arrangement described in **Section 1**. The curve, which is based on the hydrology defined in the **FFS**, shows that a run-of-river facility installed on Allison Creek could operate whenever the flows in the creek are between 85 cfs and 9 cfs for the condition:

- The maximum turbine flow is 80 cfs;
- The. minimum instream flow release is 5 cfs; and
- The minimum turbine flow is 4 cfs.

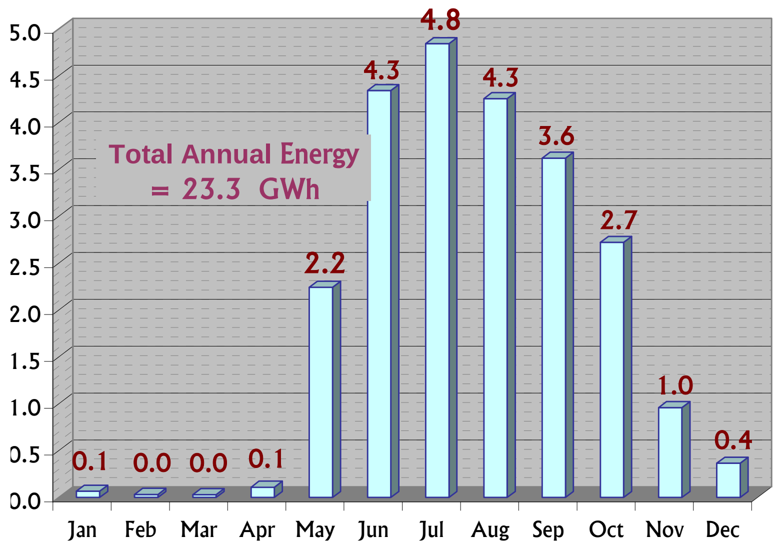
Figure 2.1
Allison Creek Flow Annual Flow-Duration Curve



On this basis, the plant could operate approximately 62% of the time and the total amount of water available for generation, Q_{gen}, is represented by the blue cross-hatched area within **Figure 2.1**. The difference in elevation between the diversion structure and the powerhouse times Q_{gen} times 8,760 hours in a year provides an estimated 23.3 GWh as the average total amount of energy potentially available from a run-of-river project on Allison Creek.

The same basic approach as applied to monthly flow duration curves results in the monthly distribution of the 23.3 GWh as shown in **Figure 2.2**.

Figure 2.2
Allison Average Monthly Distribution of Energy Production



The above analysis is valid for the case that the energy from the Project is not constrained by system load conditions. Specifically, the monthly distribution of energy as shown in **Figure 2.2** is important from the perspective of the ability of CVEA to assimilate energy from a run-of-river project on Allison Creek into their system. For example, the Solomon Gulch Project can substantially accommodate the total system under current load conditions for the month of July. Accordingly, the 4.8 GWh available generation from Allison Lake could theoretically be stranded and the Allison Creek flows would spill past the intake.

However, the complete loss of the 4.8 GWh will be offset to some degree by the storage capability within Solomon Gulch by allowing Solomon Gulch to remain full longer into the fall season. The analysis of this opportunity is with the AUTO *Vista* model as presented in the **FFS** is presented below for **Alt 4a** and **Alt 4b.**

2.2 System Loads and Resources

2.2.1 System Loads

The AUTO *Vista* model operates on hourly intervals to meet system loads in the most cost effective manner using available system resources as a function of their respective cost of production. For the present study, two cases for the system load were considered as follows:

- The system load as recorded by CVEA data for 2006, as was the basis for all previous studies; and
- The above case with the addition of a new 2 MW load to continuously serve Petro Star for 50 weeks of the year.

2.2.2 System Resources

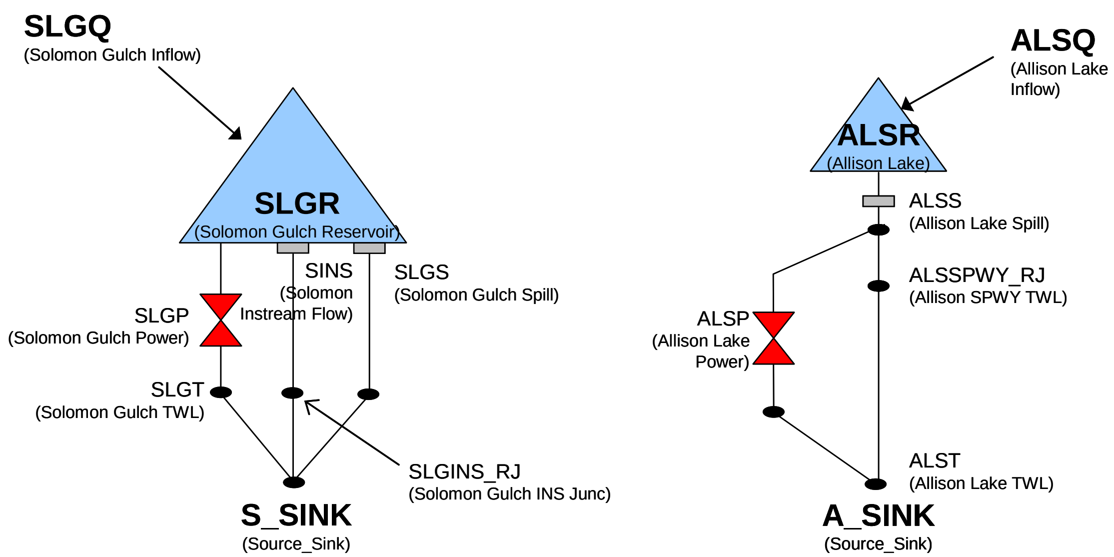
The system resources considered for the existing case included the combined diesel plant facilities in Valdez and Glennallen, the combined cycle unit as operated under the contract with Petro Star, and the existing hydropower facilities at the Solomon Gulch Project. The proposed development included the additions as discussed in **Section 1** as well as retirement of the existing thermal generation resources to the extent possible in each respective case under consideration.

2.3 AUTO *Vista* Model: Allison Creek Run-of-River Hydropower Development

AUTO *Vista* was used to evaluate the generation benefits of various upgrade configurations under consideration for the Project during the studies leading to the **FFS** Report. As stated at the close of **Section 1**, the focus of this Addendum includes **Alt 4a** and **Alt 4b** as discussed below. The following is a description of the program and a discussion of the how AUTO *Vista* was applied for the condition that the run-of-river operation of the Project is required to operate within the CVEA system.

The AUTO *Vista* model for the Project includes the drainage basins for both the existing Solomon Gulch Project and Allison Lake. It is comprised of a series of arcs and nodes with each element having its set of characteristics as defined in the **FFS**. The graphical model for the existing system, **Alt 4a** and **Alt 4b** as expressed in these terms is shown in **Figure 2.3.** Major features of the AUTO *Vista* model are briefly described below.

Figure 2.3
AUTO *Vista* Model Elements: Alt 4a and Alt 4b



2.4 Hydrology

The hydrology used for the AUTO *Vista* model is based on the work done by the U.S. Army Corps of Engineers (COE) in 1982 as part of their evaluation of the potential project configurations for maximizing the Allison Lake resource. The correlations developed from that study results in a 39-year period of average daily flows from 1950 through 1989. A statistical analysis of this period of record was performed to establish a representative smaller group of 7 years for use within the present AUTO *Vista*. The set of 7 years was chosen on the basis of balancing the wet to dry conditions of annual inflow to the two basins. The specific years chosen and the associated representative inflow conditions are summarized in **Table 2.1.**

Table 2.1
AUTO *Vista* Hydrologic Years

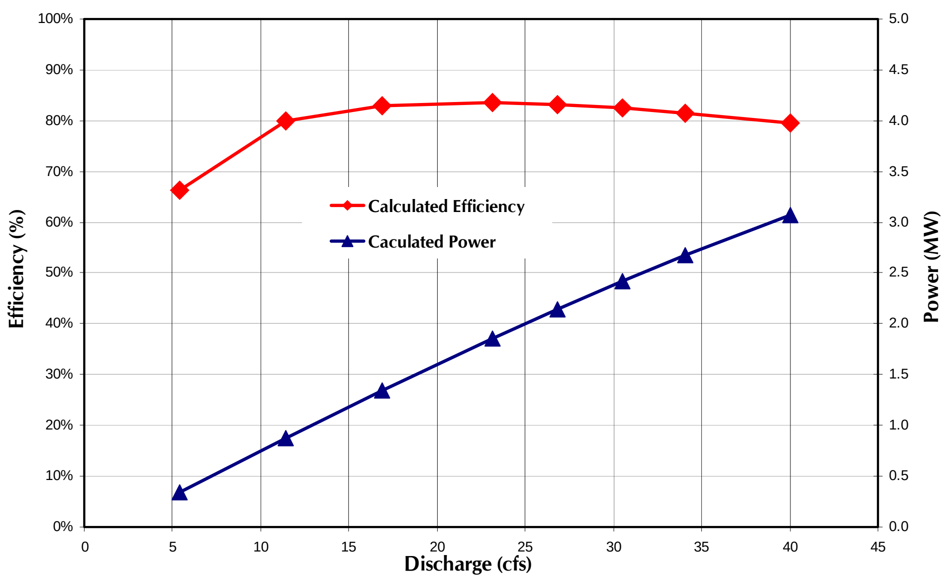
Year	Percentile	Total Inflow Acre-Feet
1969	10%	28,900
1984	25%	30,800
1954	25%	30,900
1961	50%	33,200
1957	75%	36,100
1977	75%	37,900
1989	90%	42,800
Average		**34,400**

2.5 Hydro Equipment Characteristics

The performance curves for the Solomon Gulch powerhouse have been included as provided by the CVEA. The performance of new units at the proposed Allison Lake powerhouse for **Alt 4a** is based on Hatch Acres in-house generic data for Pelton units. Both alternatives include a 6.5 MW generating station comprised of two 3.25 MW generating units. A plot of the characteristics used in this analysis for each of the 3.25 MW units is shown in **Figure 2.4**.

All elements of the conduit system components for each alternative have been assumed to perform in accordance with published engineering data.

Figure 2.4
Allison Powerhouse Unit Characteristics – 2 x 3.25 MW Units



2.6 AUTO Vista Results

Stacked bar charts indicating the most efficient dispatch of system resources as required to meet the system load are included in **Appendix A** for the existing condition, **Alt 4a**, and **Alt 4b**. The first charts compare the existing condition to the development alternatives for the 1961 water year, which is the 50% year as indicated in **Table 2.1**.

The annual generation for the base case of the existing load and resource condition for each of the 7 years included in the analysis is shown in **Table 2.2** and the annual generation for **Alt 4a and Alt 4b** for the existing load condition is shown in **Tables 2.3 and 2.4** below.

Table 2.2
Annual Generation – Existing Condition, Loads and Resources

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	51,900	0	**51,900**	11,300	23,100	86,400
1984	55,200	0	**55,200**	8,100	23,000	86,400
1954	55,700	0	**55,700**	7,600	23,000	86,400
1961	59,700	0	**59,700**	6,100	20,600	86,400
1957	58,500	0	**58,500**	7,200	20,700	86,400
1977	61,800	0	**61,800**	3,100	21,500	86,400
1989	62,100	0	**62,100**	4,400	19,900	86,400
Average	**57,800**	**0**	**57,800**	**6,800**	**21,700**	**86,400**

Table 2.3
Annual Generation – Alt 4a w/ Existing Load

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	54,600	13,700	**68,400**	500	17,500	86,400
1984	54,000	15,100	**69,200**	300	16,900	86,400
1954	49,500	13,800	**63,400**	500	22,500	86,400
1961	53,200	14,100	**67,300**	500	18,500	86,400
1957	55,100	11,800	**67,000**	500	18,900	86,400
1977	57,800	12,400	**70,200**	300	15,900	86,400
1989	57,900	10,300	**68,200**	400	17,800	86,400
Average	**54,600**	**13,000**	**67,700**	**400**	**18,300**	**86,400**

Table 2.4
Annual Generation – Alt 4b w/ Existing Load

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	55,100	15,300	**70,400**	500	15,500	86,400
1984	55,000	16,200	**71,200**	400	14,800	86,400
1954	51,900	13,600	**65,500**	500	20,300	86,400
1961	55,300	14,400	**69,800**	400	16,200	86,400
1957	56,100	12,900	**69,000**	500	16,800	86,400
1977	59,300	12,900	**72,200**	500	13,700	86,400
1989	59,300	10,900	**70,100**	500	15,800	86,400
Average	**56,000**	**13,700**	**69,700**	**500**	**16,200**	**86,400**

The annual generation for the base case of the additional 2MW load and resource condition for each of the 7 years included in the analysis is shown in **Table 2.5** and the annual generation for **Alt 4a** and **Alt 4b** for the additional 2MW load condition is shown in **Tables 2.6** and **2.7** below.

Table 2.5
Annual Generation – Existing Resources w/ 2 MW Additional Load

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	51,700	0	**51,700**	28,700	23,100	103,500
1984	54,800	0	**54,800**	25,600	23,100	103,500
1954	55,500	0	**55,500**	24,900	23,100	103,500
1961	59,100	0	**59,100**	21,400	23,000	103,500
1957	62,100	0	**62,100**	19,800	21,700	103,500
1977	66,000	0	**66,000**	15,200	22,400	103,500
1989	66,500	0	**66,500**	15,500	21,600	103,500
Average	**59,400**	**0**	**59,400**	**21,600**	**22,600**	**103,500**

Table 2.6
Annual Generation – Alt 4a w/ 2 MW Additional Load

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	57,000	18,100	**75,100**	3,000	25,500	103,500
1984	57,700	19,000	**76,700**	3,000	23,900	103,500
1954	53,500	17,800	**71,300**	8,200	24,100	103,500
1961	58,900	16,600	**75,500**	4,200	23,800	103,500
1957	59,600	15,200	**74,800**	4,600	24,200	103,500
1977	61,900	15,700	**77,700**	2,000	23,900	103,500
1989	62,600	14,000	**76,600**	4,600	22,400	103,500
Average	**58,700**	**16,600**	**75,400**	**4,200**	**24,000**	**103,500**

Table 2.7
Annual Generation – Alt 4b w/ 2 MW Additional Load

	Generation (MWh)					
Year	Solomon	Allison	**Total Hydro**	Diesel	Cogen	Total
1969	58,200	19,000	**77,200**	900	25,400	103,500
1984	58,500	20,200	**78,700**	1,000	23,900	103,500
1954	55,600	17,800	**73,400**	5,900	24,200	103,500
1961	60,400	17,100	**77,500**	2,300	23,700	103,500
1957	61,300	15,600	**76,900**	2,600	24,100	103,500
1977	63,800	15,700	**79,500**	300	23,700	103,500
1989	63,800	14,900	**78,600**	2,500	22,400	103,500
Average	**60,200**	**17,200**	**77,400**	**2,200**	**23,900**	**103,500**

The annual general benefits from the AUTO *Vista* Analyses for **Alt 4a** and **Alt 4b** can then be summarized for each load case as shown in **Table 2.8** in terms of the incremental hydropower generation and associated reduction on thermal power as required to satisfy the system load for each of the alternatives under consideration. Please note that the minor differences between the hydro and thermal generation values for each alternative are due to rounding within the AUTO *Vista* modeling.

Table 2.8
Annual Benefits – Alt 4a & 4b

	Existing Load - Generation (MWh)			2 MW Addition - Generation (MWh)		
Resource	**Existing**	**Alt 4a**	**Alt 4b**	**Existing**	**Alt 4a**	**Alt 4b**
Hydro	57,800	67,700	69,700	59,400	75,400	77,400
Fossil	28,500	18,700	16,700	44,200	28,200	26,100
Total	86,300	86,400	86,400	103,600	103,600	103,500
Benefit		**9,900**	**11,900**		**16,000**	**18,000**

3. Project Construction Cost and Construction Schedule

Construction costs and schedules were prepared and reported for the various upgrade configurations under consideration for the Project during the Pre-Feasibility Study, Interim Feasibility Review, and Final Feasibility Study. As stated at the close of **Section 1**, the focus of this Addendum to the Final Feasibility Study Report is **Alt 4a** and **Alt 4b** as discussed below.

3.1 Construction Cost Estimates

All cost estimates are based on January 2010 bid price levels. The Direct Construction Cost for each alternative is the total of all costs directly chargeable to the construction of the project and in essence represents a contractor's bid. Indirect costs include an allowance for contingencies, engineering, and owner administration and are added to the Direct Construction Cost to result in the Total Construction Cost. The contingency used for all alternatives is 25%. The assumed Engineering and Owner Administration during the design and construction phase of the Project is 15% of construction cost for all alternatives, inclusive of contingencies.

The period of time required to complete the Federal Energy Regulatory Commission (FERC) pre-filing licensing process can be expected to be approximately 3 years, which started in September 2008 with the receipt of the Preliminary Permit from the FERC. At this time, it is planned that a license application would be ready to be filed with the FERC in the Fall of 2011. It is anticipated that the subsequent post-filing process would result in a license issued by the FERC within approximately 2 years following submittal, resulting in a FERC Order Issuing License in late 2013. The winter site conditions and the development and review of final construction plans as required by the FERC would lead to a July construction start in 2014. Adding another 2^{+} years to construct the project indicates a realistic on-line date for the Project would be in the range of late 2015 to early 2016. Accordingly, it is appropriate to include escalation to the above costs to determine a realistic on-line cost for the Project. However, for the purposes of the present economic analyses, 2010 dollars are used herein to avoid the need to hypothesize what the cost of thermal generation may be that far into the future.

3.1.1 Alternative 4a

The basis for the construction cost of the various elements of **Alt 4a** are listed below as follows**:**

- *Mobilization*. The mobilization cost is taken directly from the estimates for **Alt 3c** on the basis that the construction activities for the initial year of construction are nearly identical.
- *Construction Access Trail*. The cost of the 4,500 foot access trail to the high point of the penstock above the powerhouse is estimated as 60% of the estimate for the access road for **Alt 3c**. The overall length of the trail is approximately 30% of that of the route for **Alt 3c**, and the width of the road bench for the trail will be two-thirds for that required for **Alt 3c**. However, the alignment for the trail will be the same as that for the **Alt 3c** road, which is by far the most difficult portion for construction.
- *Diversion Structure*. The cost for the diversion structure is based on the unit costs for similar features of the nearby diversion structure for the Humpback Creek project that is currently under construction for Cordova Electric Cooperative.

- *Surface Pipeline / Penstock*. The cost of the surface pipeline / penstock is based on the detailed estimates developed for the comparable penstock segments of **Alt 3c** as included in **Appendix E** of the **FFS**.
- *Powerhouse*. The costs for the major equipment within the 6.5 MW powerhouse are based on preliminary quotations from equipment suppliers while the cost for other lower cost items were obtained from in-house cost data and from recently obtained bid prices on similar construction.
- *Switchyard*. The switchyard cost is taken directly from the estimate for **Alt 3c**.
- *Transmission*. The transmission cost is taken directly from the estimate for **Alt 3c**.

The resulting construction cost estimate for **Alt 4a** is summarized in **Table 3.1.**

Table 3.1
Alternative 4a
Total Construction Cost (Bid 1/2010)

Item		
1. Mobilization		$1,573,000
2. Construction Access Trail		$2,916,000
3. Dam, Intake & Spillway		
a. Diversion Structure	$2,230,000	
b. Spillway	$0	
		$2,230,000
4. Surface Penstock / Pipeline		
a. HDPE Pipeline	$0	
b. Steel Pipeline	$5,176,000	
Subtotal		$5,176,000
5. Powerhouse		
a. Civil Works	$2,594,000	
b. Turbine & Generator	$4,710,000	
c. Misc. Mech. Equip.	$683,000	
d. Misc. Elec. Equip.	$1,015,000	
e. Bridge Crane	$187,000	
Subtotal		$9,189,000
6. Switchyard		$525,000
7. Transm. & Interconnection		$310,000
Direct Construction Cost (Bid 1/09)		$21,919,000
Escalation		-$590,000
Direct Construction Cost (Bid 1/10)		$21,329,000
Contingencies		$6,076,000
Engineering & Owner Admin.		$4,111,000
Total Construction Cost (Bid 1/10)		$32,106,000

3.1.2 Alternative 4b

The cost for the addition of a Obermeyer Gate 5 feet in height on the top of the Solomon Gulch Spillway was considered on its own as an incremental feature for the CVEA system. The cost of this addition is based on a preliminary quotation for the gate materials and a configuration as suggested by the Obermeyer company. The costs for modifications to the existing spillway and installation of the gate are based on estimated quantities of construction and in-house unit costs. The resulting cost for **Alt 4b** is summarized in **Table 3.2**.

Table 3.2
Alternative 4b
Total Construction Cost (Bid 1/2010)

Item		
Labor	$2,106,000	
Equipment	$235,000	
Materials	$1,951,000	
Direct Construction Cost (Bid 1/10)		**$4,292,000**
Contingencies		**$858,000**
Engineering & Owner Admin.		**$773,000**
Total Construction Cost (Bid 1/10)		**$5,923,000**

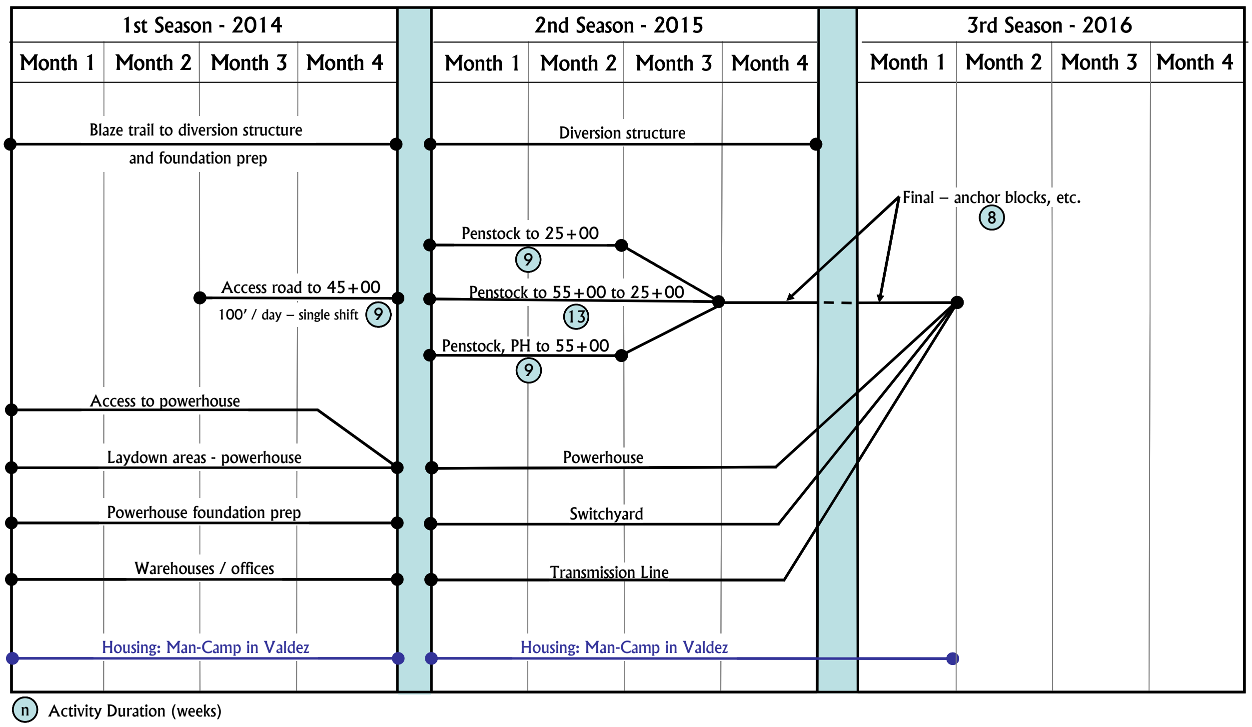
3.2 Construction Schedule

The construction schedule for **Alt 4a** and **Alt 4b** is primarily controlled by the following major factors:

- Delivery time for major powerhouse equipment;
- Access to Allison Lake for construction activity;
- Four month window for construction activity at Allison Lake, generally from mid-July to mid-October depending on conditions; and
- Earliest most reasonable construction start in 2014 based on estimated timing of FERC license issuance (as discussed above).

A similar approach has been used to develop a schedule for each alterative relative to the purposes of the cost estimates presented above and the annual costs presented below for each alternative. The schedule for **Alt 4a** is presented in **Figure 3.3** as an example thereof.

Figure 3.3
Alternative 4a
Construction Schedule



3.3 Economic Analysis

Annual costs of the Project can be apportioned into fixed and variable costs. The fixed amount includes amortization of the Total Capital Requirements less earnings on Reserves and is based on 7% interest rate financing over a 30-year term. Variable annual costs escalate each year and include operation and maintenance (O&M) costs, administrative and general expenses, interim replacements, and insurance. The basic assumptions for determining the annual fixed and variable costs of the Project are shown in **Table 3.3**.

Table 3.3
Basic Assumptions for Economic Analyses

Item	Value
Construction Period (Alt 4a)	25 months
Financing Term	30 years
Financing Interest Rate	7%
Reinvestment Rate	Same as financing
Escalation of Project Costs	3% annually
Financing Reserve	1 year of debt service
Financing Expenses	3% of Total Investment Cost
Variable Annual Costs	$500,000

3.3.1 Cost of Power – Alternative 4a

The Total Investment cost includes interest during construction (IDC) over an assumed 25-month construction period. As outlined above, we have assumed that construction at the project site would come to a stop during the winter months, with the exception of equipment installation within the powerhouse structure. The development of the annual cost for **Alt 4a** is shown in 2010 dollars on **Table 3.4**.

Table 3.4
Alternative 4a – First Year Annual Cost (2010 dollars)

Item	Cost
Total Construction Cost (Bid 1/10)	**$32,106,000**
Interest During Construction	2,435,000
Total Investment Cost	**$34,541,000**
Reserve Fund	3,127,000
Financing & Legal	1,036,000
Working Capital	100,000
Total Capital Requirements (1/10)	**$38,804,000**
Annual Cost	
Debt Service	$3,127,000
O&M Cost	280,000
Administrative & General	112,000
Insurance	50,000
Interim Replacements	50,000
Earnings on Reserve Fund	(219,000)
Total First-Year Annual Cost	**$3,400,000**

As discussed in **Section 2** above, the unit cost of power becomes a function of the extent to which the power available from the Project can actually contribute to the CVEA system load on a day-to-day, hour-to-hour basis. In this regard, three scenarios are presented including:

1. The AUTO *Vista* studies performed indicate that a total of 9,900,000 kWh from the Project can be used within the existing CVEA system load.
2. With an additional 2 MW of load within the CVEA system, the AUTO *Vista* studies performed also indicate that a total of 16,000,000 kWh from the Project can be effectively utilized.
3. The review of the available flow data for Allison Creek indicates that a 6.5 MW run-of-river project at the site would have the capability to produce a total of 23,300,000 kWh at such time that the CVEA system load that would not constrain its operation.

The cost of power resulting from these three scenarios is presented in **Table 3.5**.

Table 3.5
Alternative 4a – Cost of Power

Item	Value
Total First-Year Annual Cost	**$3,400,000**
Alt 4a with Existing System Load (kWh)	9,900,000
First-Year Cost of Power (1/2010) ($/kWh)	**$0.343**
Alt 4a with 2 MW Additional Load (kWh)	16,000,000
First-Year Cost of Power (1/2010) ($/kWh)	**$0.213**
Alt 4a with Expanded CVEA System (kWh)	23,300,000
First-Year Cost of Power (1/2010) ($/kWh)	**$0.146**

3.3.2 Cost of Power – Alternative 4b

As indicated by the results included in **Table 2.8**, the addition of the Obermeyer gate to the Solomon Gulch spillway adds 2,000,000 kWh to the energy for the **Alt 4a** development with and without the anticipated additional 2 MW of load to the CVEA system. Further, the **Alt 4b** contribution to the CVEA system load is essentially the same without a run-of-river development of Allison Creek. The resulting cost of power during the first year of operation is shown in **Table 3.6**.

Table 3.6
Alternative 4b – Cost of Power

Item	Cost
Total Construction Cost (Bid 1/10)	**$5,469,000**
Interest During Construction	255,000
Total Investment Cost	**$5,724,000**
Reserve Fund	526,000
Financing & Legal	172,000
Working Capital	100,000
Total Capital Requirements (1/10)	**$6,522,000**
Annual Cost	
Debt Service	$526,000
O&M Cost	280,000
Administrative & General	112,000
Insurance	50,000
Interim Replacements	50,000
Earnings on Reserve Fund	(37,000)
Total First-Year Annual Cost	**$981,000**
Added Hydro Generation, Existing System (kWh)	2,000,000
First-Year Cost of Power (1/2010) ($/kWh)	**$0.491**

4. Regulatory and Environmental Considerations

Section 5 of the **FFS** presents our full evaluation of the regulatory and environmental considerations relative to hydroelectric project development in general, and specifically, to a 4.5 MW storage project at Allison Lake. Regulatory and environmental work continues to proceed toward preparation of an Application for License to the FERC. This section presents the impacts on the ongoing regulatory process and environmental investigations of the additional identified alternatives, **Alt 4a** and **Alt 4b**.

4.1 Alternative 4a

4.1.1 Regulatory Considerations

CVEA issued a Preliminary Application Document (PAD), including the Draft Application for License and Preliminary Draft Environmental Assessment (PDEA) (Draft Application) for the Allison Lake Project on April 13, 2010. The PAD, including the Draft Application for License, described a proposed 4.5 MW storage project and was prepared under the regulation for *Major Unconstructed Project Less Than 5 MW* pursuant to 18 CFR 4.61.

The run-of-river modification to the Project would have an installed capacity of 6.5 MW and therefore would be greater than 5 MW and the Application for License would be prepared pursuant to 18 CFR 4.41, *Major Unconstructed Project Greater Than 5 MW*. This change in the applicable FERC regulation would not significantly affect either the environmental work to date or the PDEA. However, the change does necessitate that the engineering information be modified and expanded as required under 18 CFR 4.41.

The change from the 4.5 MW storage project to the proposed 6.5 MW run-of-river project will require:

1. Revision of the PDEA to present the run-of-river project description and related operation as it differs from the storage project description and operation.
2. Preparation of the revised engineering exhibits. The Draft Application as provided on April 13, 2010, included a single engineering exhibit (Exhibit A) for the proposed 4.5 MW storage project containing the required engineering information pursuant to 18 CFR 4.61. The change to the proposed 6.5 MW run-of-river project changes the applicable FERC regulation to 18 CFR 4.41 and the engineering exhibits expand to four exhibits (Exhibits A through D), each containing greater detail and additional information beyond the single engineering exhibit previously prepared.
3. Preparation and issuance of Revised Scoping Document 1 (SD1). SD1 was issued on April 22, 2010, and scoping meetings were held on May 10 and 12, 2010. The process for issuing a revised SD1 was discussed with FERC staff. CVEA will not be required to hold new scoping meetings, nor conduct an additional site visit (initial site visit was in 2005). FERC Staff recommended that CVEA:
    a. Issue a revised SD1 along with a revised PAD; and
    b. Following provision of the revised documents, schedule a teleconference with the resource agencies and other interested participants to discuss the revised proposed Project.

In light of the above, the level of effort going forward for document preparation for the 6.5 MW run-of-river option would be greater than that required for the 4.5 MW storage option due to the redundancies involved with following the 18 CFR 4.41 process. However, the downstream benefits in the activities for development of the run-of-river project would be greatly increased as discussed below, greatly overweighing the additional effort required for document preparation and the licensing process itself.

4.1.2 Environmental Field Investigations

In support of the preliminary permit, environmental field investigations began in 2008 for the Project. The status of these field investigations and desk-top reviews as of May 2010 is summarized in Section 5 of the **FFS** and the complete reports can be found in Appendix F to the **FFS**. The major studies conducted are listed in **Table 4.1**.

All of the studies to date are equally applicable to the run-of-river project as discussed herein and those arrangements considered in the **FFS**. Further, the selection of a run-of-river arrangement for the project is not expected to require any new major areas of study to support the preparation of the FERC License Application. However, as indicated by **Table 4.1**, on-going work will be required in several areas as follows:

- ***Water Use & Quality.*** The on-going work in this area will primarily be continued monitoring of the two stream gages in order to develop and maintain a continuous record for the flow regime for Allison Creek.
- ***Biological Resources.*** The baseline work for fish populations and habitat, vegetation, birds and mammals, and wildlife habitats is complete. Areas that will require further work include:
    - <u>Aquatic Resources:</u> Further work will be necessary to provide a basis for final negotiation of the amount of flow required to maintain an in-stream flow between the diversion structure and the powerhouse.
    - <u>Wetlands:</u> Further work will be required to evaluate the extent of any wetlands located along the selected transmission line alignment.
- ***Archaeological / Historical Resources.*** The field work for the archaeological and historical resources of the project area has been completed.

Table 4.1
Summary of Major Environmental Field Studies

Type of Field Investigation	Conducted By	Timeline	
Geological Resources (As described in Section 2)	R&M Consultants	Began: Completed:	2008 2009
Water Use and Quality	R&M Consultants	Began: Completed:	2008 on-going
Biological Resources - Fish and Aquatic Resources - Vegetation - Wetlands - Birds and Mammals - Wildlife Habitats	ABR, Inc.	Began: Completed:	2008 on-going
Archaeological/Historical	NLUR, Inc.	Began: Completed:	2009 2010

4.1.3 *Environmental Considerations*

While the regulatory framework for **Alt 4a** is more detailed than that associated for **Alt 3c**, the associated scope of environmental issues is greatly reduced. The more significant elements of this comparison are:

1. Allison Lake would be left in its natural state in the case of **Alt 4a**, which has not been the case for all arrangements previously considered. The lake would have been drawn down by as much as 100 feet during the winter season in the lake-tap alternatives. Conversely, the lake would have been raised 43 feet in the case of **Alt 3c** thereby inundating the existing east and west shorelines and the delta at the south end of the lake.
2. The construction activity of the dam near the outlet of the lake would disturb a significant area with attendant concerns for water quality within Allison Creek to a much greater extent than would be associated with the construction of the diversion structure for **Alt 4a**.
3. The construction of the diversion structure for **Alt 4a** would not require that a road be constructed to the outlet of Allison Lake nor the extensive amount of traffic associated with the construction of the major dam structure included with **Alt 3c**.
4. In the case of **Alt 3c**, there would be a potential for seepage beneath and around the dam resulting in a loss of water available for hydropower generation as well as changed ground water conditions in the glacial moraine downstream of Allison Lake. While not likely, any seepage that may occur at the location of the diversion structure associated with **Alt 4a** would be very minor.
5. In the case of **Alt 4a**, the flow regime within Allison Creek would remain unchanged between Allison Lake and the diversion structure as well as within the reach downstream of the powerhouse, the latter being the area of primary concern for the habitat for both resident and anadromous fish species.

All of these factors would greatly reduce the level of effort required for **Alt 4a** as compared to **Alt 3c** for agency consultation throughout the remaining licensing activities as well as for environmental monitoring during construction and operation of the project.

4.2 Alternative 4b

4.2.1 *Regulatory Considerations*

An amendment to the existing Solomon Gulch Project FERC License (No. P-2742) would be required for the proposed five foot raise in the normal maximum water surface of Solomon Lake as proposed for **Alt 4b**. The amendment would require that agency consultation take place in a manner comparable to that currently anticipated for the Allison Lake development. As part of the consultation process, issues that were not resolved according to current practice during the original licensing process would likely be revisited by existing agency staff.

4.2.2 *Environmental Field Studies*

Ostensibly, the environmental field studies would focus on habitat values within the additional area to be submerged surrounding Solomon Lake as the result of the proposed five foot raise in the normal maximum water surface of Solomon Lake. It can be expected, however, that agency consultation would result in requests for further studies with regard to other aspects of the project that were not studied in accordance with current practice as part of the original licensing process.

4.2.3 Environmental Considerations

No specific concerns of a fatal flaw nature have been identified with regard to the environmental effects of the proposed five foot raise in the normal maximum water surface of Solomon Lake as proposed for **Alt 4b**.

5. Conclusions and Recommendations

5.1 Conclusions

5.1.1 Alternative 4a

In addition to the general conclusions relating to the development of a hydropower project in the Allison Creek basin as provided in the **FFS**, conclusions specific to the run-of-river **Alt 4a** gained as the result of the present evaluation include the following:

- The scope of the project as proposed for the run-of-river **Alt 4a** is significantly reduced from that associated with **Alt 3c**.
- A run-of-river **Alt 4a** development of the Allison Creek basin can produce 23.3 GWh of energy on an average annual basis within the environment of an unconstrained system load.
- A run-of-river **Alt 4a** development of the Allison Creek basin would produce 9.8 GWh of energy on an average annual basis within the existing CVEA system load. The project is not cost effective under this load condition.
- With the addition of 2 MW to the CVEA system load, the **Alt 4a** average annual contribution to the CVEA system load would increase to 16.0 GWh. On this basis, the project would be competitive with the cost of diesel generation.
- Further increases in the CVEA system load would in turn result in a further reduction in the cost of power from **Alt 4a**.
- The reduced scale of the hydropower development of the Allison Creek basin as offered by **Alt 4a** would in turn minimize the risk of construction cost overruns relative to that potentially associated with **Alt 3c**.
- The diversion structure proposed for **Alt 4a** would entail a minimal, if any, risk of seepage or other dam safety related issues in contrast to that potentially associated with the large dam at the outlet of Allison Lake as proposed for **Alt 3c**.
- On the basis that the installed capacity of the run-of-river **Alt 4a** is expected to be greater than 5 MW, FERC 18 CFR 4.41 would be the required regulation for the preparation of a FERC License Application for the project.
- The reduced scale of the hydropower development of the Allison Creek basin as offered by **Alt 4a** will result in an overall reduction in environmental effects relative to that associated with **Alt 3c**.
- In contrast to any of the storage project arrangements as previously considered for development of the Allison Creek basin, the run-of-river configuration as proposed for **Alt 4a** would maintain the existing flow and temperature regimes downstream of powerhouse. This would be a major advantage for **Alt 4a** owing to the critical importance of this reach of Allison Creek to resident and anadromous fish populations.
- **Alt 4a is superior to Alt 3c in all respects**.

5.1.2 Alternative 4b

Conclusions specific to **Alt 4b** gained as the result of the present evaluation include the following:

- The addition of inflatable gates to the Solomon Gulch Spillway as proposed for **Alt 4b** would add approximately 2 GWh of average annual energy to the CVEA system for service to all system load and resource conditions considered for the project, existing and future.

- The addition of inflatable gates to the Solomon Gulch Spillway as proposed for **Alt 4b** would require an amendment to the existing FERC License for the Solomon Gulch Project.
- On the basis of the energy potential and cost estimates prepared for this evaluation, the addition of inflatable gates to the Solomon Gulch Spillway as proposed for **Alt 4b** would not currently be economically viable relative to the other resources available to the CVEA.

5.2 Recommendations

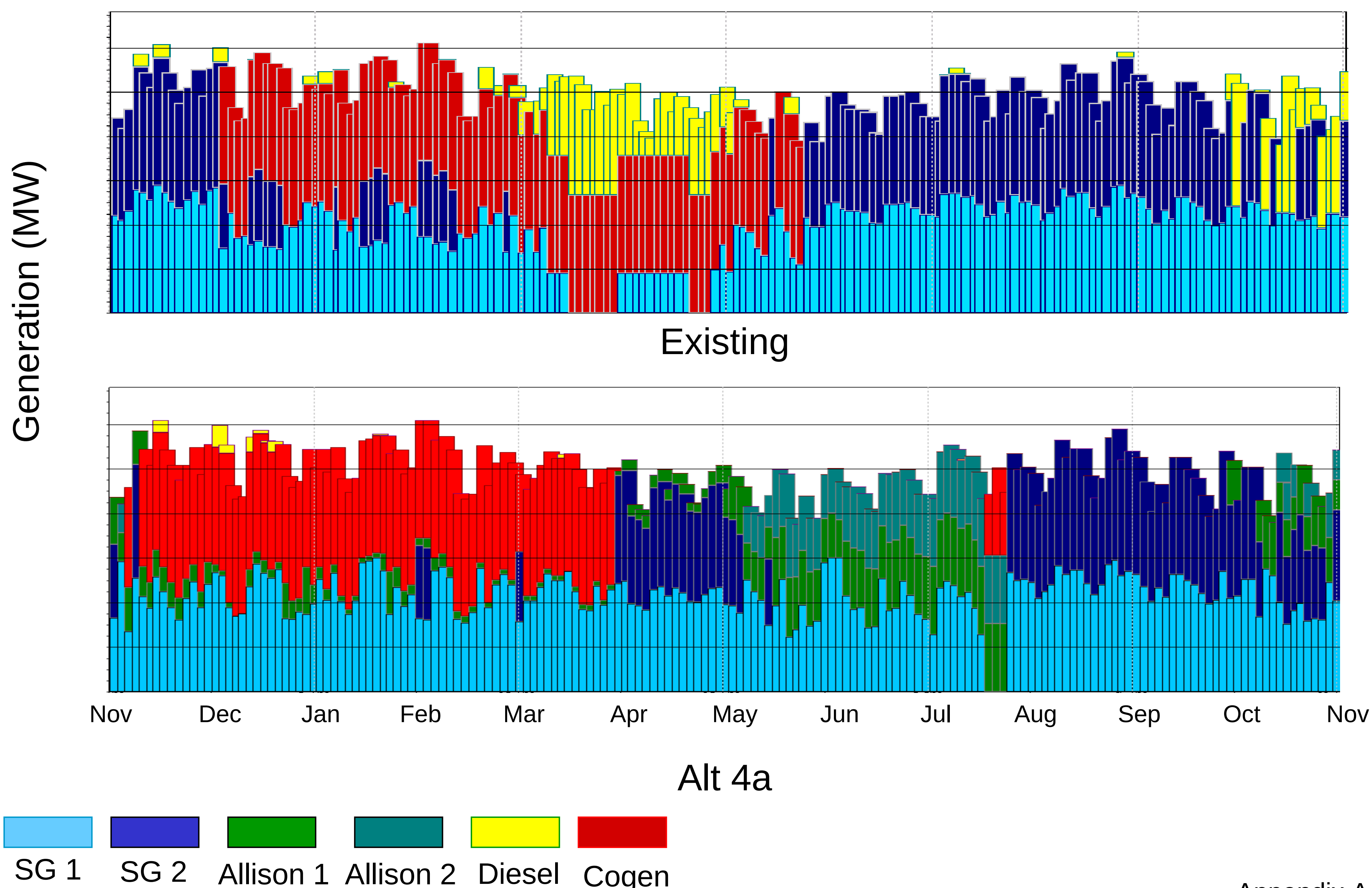
Based on the conclusions referenced and outlined above, we provide the following recommendations:

- Adopt **Alt 4a** as the preferred alternative for the development of the hydroelectric potential of the Allison Creek basin;
- Terminate further consideration of **Alt 3c** and **Alt 4b**;
- Complete the analysis of the environmental effects of a hydropower development within the Allison Creek basin on the basis of **Alt 4a**;
- Optimize the capacity of the powerhouse for the run-of-river **Alt 4a**; and
- Prepare a FERC License Application for **Alt 4a** pursuant to the provisions of 18 CFR 4.41.

6. References

1. Hatch Acres Corporation, Allison Lake Hydropower Development – FINAL FEASIBILITY STUDY, prepared for Copper Valley Electric Association, May 2010 .
2. HDR Engineering, Inc., SOLOMON GULCH HYDROELECTRIC PROJECT – RESERVOIR CAPACITY – FEASIBILITY STUDY, prepared for Copper Valley Electric Association, November 1991.

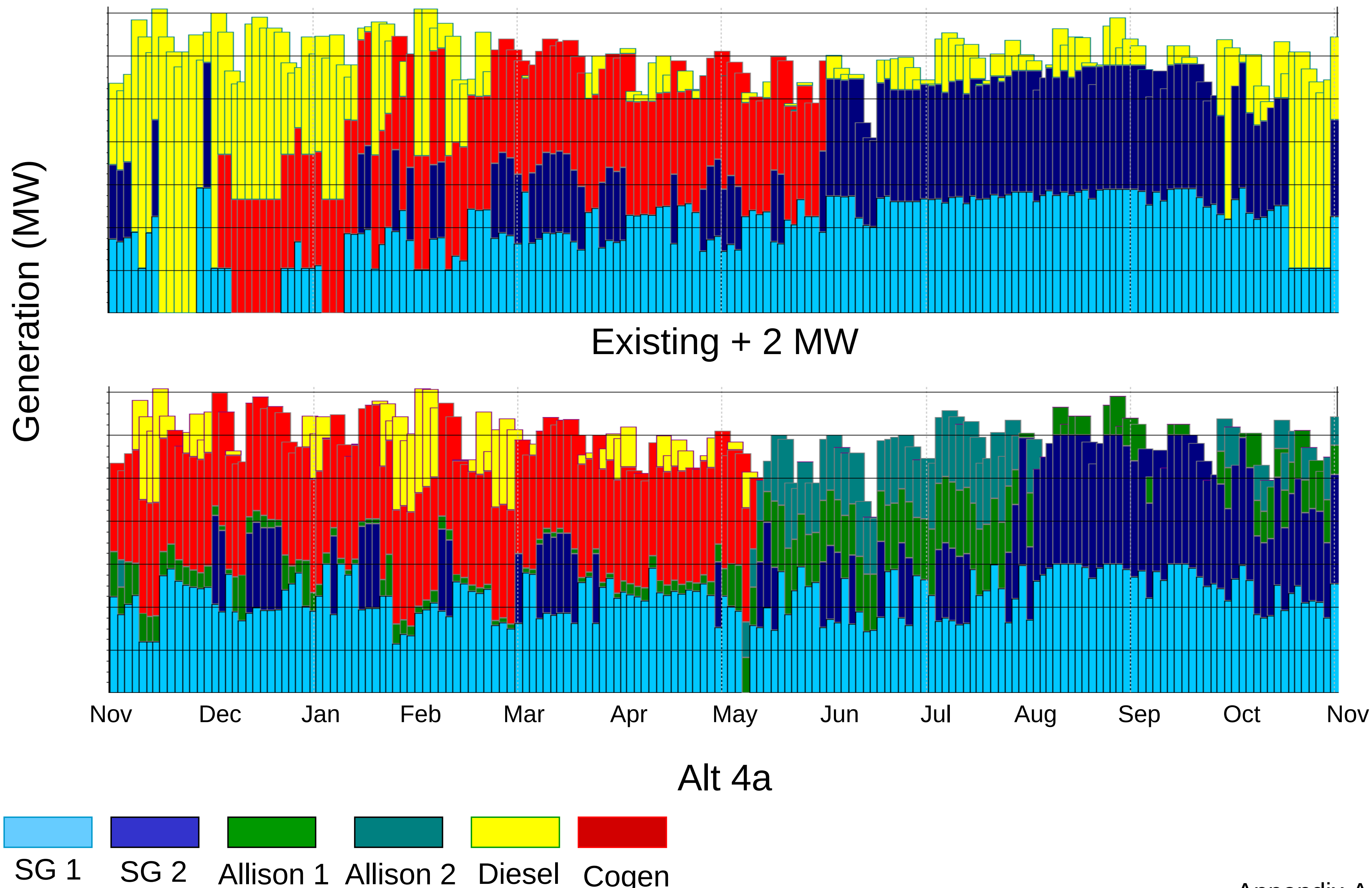
Appendix A
Alt 4a System Dispatch



AUTOVista ANALYSIS – ALT 4a
Annual Dispatch w/ Existing Load –1961

Appendix A -1

HATCH



AUTOVista ANALYSIS – ALT 4a

Annual Dispatch w/ 2 MW Added Load Load –1961

Copper Valley Electric

Your Member-Owned Cooperative

Appendix B
Obermeyer Gate – Cost Estimate

HATCH™

SOLOMON GULCH HYDROELECTRIC FACILITY OBERMEYER GATE INSTALLATION
Construction Cost Summary
NEW INSTALLATION
Based on Dick Freeman's Avista- Nine Mile estimate dated Dec 18, 2007 and Jim Rutherford's Humpback Creek Estimate, 03/2009, and Obermeyer quote dated October 22, 2010

		TOTAL	LABOR					EQUIPMENT					MATERIALS			
No.	Item		Crew Size	Hours / Crew	Hours	Rate	Total	Item	Qty	Rate	Weeks	Total	Item	Qty	Rate	Total
1	**Mobilization**	**$57,200**					**$42,000**					**$15,200**				**$0**
			7	80	560	75	$42,000	966 Loader	1	4000	2	$8,000			1	$0
								Flatbed trucks	2	1500	2	$6,000				
								Pettibone Fork Lift	1	600	2	$1,200				
2	**Remove Existing Splitter Piers**	**$67,800**					**$52,500**					**$4,800**				**$10,500**
			7	100	700	75	$52,500	600 cfm compressor	1	1800	2	$3,600	Miscellaneous (20% of labor)	10500	1	$10,500
								Pettibone Fork Lift	1	600	2	$1,200				
												$0				
3	**Drill and Set Anchors - 112 each**	**$210,320**					**$144,000**					**$31,200**				**$35,120**
			8	240	1920	75	$144,000					$0	Miscellaneous	5000	1	$5,000
												$0	Anchors 1" x 15 ft x 56 ea x 2.67 lbs ea.	5000	3	$15,000
				0				600 cfm compressor	1	1800	4	$7,200	Grout	1680	9	$15,120
								airtracks	2	2700	4	$21,600				
								Pettibone Fork Lift	1	600	4	$2,400				
4	**Pour Concrete**	**$311,366**					**$180,000**					**$70,400**				**$60,966**
	Description: Pour additional spillway concete to anchor Obermeyer Gate, middle spitter wall and create a right abutment. Approx. 524 CY of concrete with a 1:2:4 mix, 4 x 60 hour weeks											$0				
	Labor - 10 men working 6 (10) hour days		10	240	2400	75	$180,000									
								Generator - 60 kw	1	900	4	$3,600	Miscellaneous	5000	1	$5,000
								Compressor - 66 cfm	1	2100	4	$8,400	Form lumber	27600	$0.50	$13,800
								Mix truck	1	5500	4	$22,000	Rebar - cut, bundled in town	32390	$0.80	$25,912
								Water truck	1	2500	4	$10,000	Cement	72	$90	$6,480
								Concrete pump	10	600	4	$24,000	Sand	171	$10	$1,710
								Pettibone Fork Lift	1	600	4	$2,400	Gravel	281	$12	$3,372
								Misc vibrators, saws, drills	1	0	4	$0	Additives/Curing (add 10% to all)	1.38	$3,400	$4,692
5	**Install Air Piping Along Crest**	**$78,540**					**$60,000**					**$5,800**				**$12,740**
			8	100	800	75	$60,000	600 cfm compressor	1	800	2	$1,600				
								flatbed truck	1	1500	2	$3,000				
								Pettibone Fork Lift	1	600	2	$1,200				
													2" pipe with fittings, galvanized	530	20	$10,600
													miscellaneous	2140	1	$2,140

SOLOMON GULCH HYDROELECTRIC FACILITY OBERMEYER GATE INSTALLATION
Construction Cost Summary
NEW INSTALLATION
Based on Dick Freeman's Avista- Nine Mile estimate dated Dec 18, 2007 and Jim Rutherford's Humpback Creek Estimate, 03/2009, and Obermeyer quote dated October 22, 2010

		TOTAL	LABOR					EQUIPMENT					MATERIALS			
No.	Item		Crew Size	Hours / Crew	Hours	Rate	Total	Item	Qty	Rate	Weeks	Total	Item	Qty	Rate	Total
6	**Set Obermeyer Assemblies in Place**	**$1,764,325**					**$234,000**					**$43,600**				**$1,486,725**
			13	240	3120	75	$234,000					$0				
								Pettibone Fork Lift	1	600	4	$2,400	Obermeyer			$1,486,725
								60 ton crane	1	7000	4	$28,000	2 each 225' long x 5' high, assumed			
								600 cfm compressor	1	1800	4	$7,200	same cost as AVISTA, 9 mile			
								flatbed truck	1	1500	4	$6,000	(250' long x 10' high)			
7	**Install Abutment Seal Plates (both ends)**	**$479,400**					**$405,000**					**$50,400**				**$24,000**
			15	360	5400	75	$405,000					$0				
								Pettibone Fork Lift	1	600	6	$3,600	Drill bits, epoxy grout	14000	1	$14,000
								600 cfm compressor	1	1800	6	$10,800	Anchors	600	1	$600
								mish air tools	13500	1	2	$27,000	Concrete	1200	1	$1,200
								flatbed truck	1	1500	6	$9,000	Form lumber	500	2	$1,000
													Handrail platforms (lbs)	1440	5	$7,200
8	**Install Compressor, MCC, Local Controls**	**$78,000**					**$60,000**					**$12,000**				**$6,000**
			8	100	800	75	$60,000	flatbed truck	1	1500	2	$3,000	Miscellaneous	6000	1	$6,000
								10 Ton Crane	1	7000	1	$7,000				
								Miscellaneous	1	1000	2	$2,000				
								Pettibone Fork Lift	1	600	2					
9	**Raise Reservoir, Startup, Turnover**	**$34,000**					**$30,000**					**$2,000**				**$2,000**
			4	100	400	75	$30,000	Miscellaneous	2000	1	1	$2,000	Miscellaneous	2000	1	$2,000
	SUBTOTAL	**$3,080,951**	80	1560	16100		**$1,207,500**					**$235,400**				**$1,638,051**
	Supervision (% of labor)	$301,875				25%	$301,875									
	Overhead (% of labor)	$181,125				15%	$181,125									
	Overtime factor (% of total labor)	$169,050				10%	$169,050									
	Profit on labor (% of labor)	$148,764				8%	$148,764									
	Profit on materials (% of labor)	$81,903				5%										$81,903
	Contigency (20%)	$792,734														
	Engineering & Owqner Administration (15%)	$713,460														
	SUBTOTAL	**$5,469,861**														

OBERMEYER ***HYDRO, INC.***

P.O. BOX 668 FT. COLLINS, COLORADO 80522 USA TEL 970-568-9844 FAX 970-568-9845
E-mail: hydro@obermeyerhydro.com WWW: http://www.obermeyerhydro.com

October 22, 2010

Project Quotation Sheet
Project: Solomon Gulch, Alaska
Client: Joe Earsley, Hatch Associates Consultants, Inc.
Gate Size: 5' high x 450' long

Obermeyer Hydro, Inc. (OHI) is pleased to issue this proposal for the supply of an Obermeyer Water Control Gate for the Solomon Gulch Project in Alaska. Obermeyer Hydro will supply the following components for this project:

Steel Package: (23), nominal 19.56' wide steel gate panel (4200-lbs each) along with ductile iron clamp castings, hinge retainers, web retainers, splitters, restraining strap clamps, and two UHMW polyethylene plates. Gate panels and peripheral parts to be sand blasted and coated with CeramKote 54 epoxy paint. Ductile iron castings shall be sand blasted and hot dip galvanized in accordance with ASTM A123 and ASTM 153.

Bladder Package: (23), nominal 19.56' wide two ply polyester reinforced dual chamber air bladders complete with air bladder connection assemblies for connection into owner supplied air piping.

Control System: One OHI model 10-3 automatic water level control system. Control system to utilize a Square D Momentum Series PLC to maintain a user input upstream water elevation. PLC to measure upstream water elevation using included KPSI submersible depth transmitter. Control system provided in dual Nema 12 rated electrical boxes (PLC and mechanical). Operator interface to PLC to be via color touchscreen panel. Control system to have capability to control up to three independent gate zones.

Air Supply : Dual Ingersoll Rand model UP6-30-125 rotary screw air compressors with desiccant air dryers, filtration system, and 400-gallon receiver tank. Each compressor to output 125-cfm at 125-psig and shall actuate the gate to normal operating pressure in approximately 60-minutes with both machines operating. 3-phase power required.

Misc. Package: All stainless steel gate system anchor bolts, stainless steel fasteners, stainless steel abutment and restraining strap anchor bolts, interpanel seals, three copies of engineering drawings and calculations, and three copies of operation and maintenance manuals.

Obermeyer Hydro is pleased to offer this complete package FOB Wellington, Colorado for the sum total of USD 1,486,725.00. This price is valid until November 30, 2010. Shop drawings will be available within 4-weeks of purchase order. Delivery of gate shall be in accordance with mutually agreed upon project schedule

The above prices specifically exclude the following items:

1. Interconnecting wiring or piping.
2. Building for housing compressor and controls.
3. Installation except for any purchased supervision and training.
4. Any needed anchor bolt epoxy.
5. Bid, supply, or performance bond.
6. Federal, state, or any local taxes.

In addition to the above equipment supply package OHI also recommends the following installation supervision and owner training program:

Trip One: Ten day on-site installation consulting trip by OHI technical during gate installation. Purpose of the trip is to supervise the installation of the gate and the control building equipment.

Trip Three: Two day system start-up and owner training trip. Day one will be dedicated to gate testing and day two will be for owner training and Operation and Maintenance manual review.

The price for the listed installation supervision and owner training program is USD 12,000.00. Additional on-site services are available for USD 1000.00 per day plus any added travel related expenses.

As all parts are custom manufactured, a thirty percent (30%) deposit will be required with the placement of an order. The balance, less five percent (10%) retention shall be upon shipping from Wellington, Colorado. The retention shall be due net sixty days after shipping from Wellington, Colorado or upon commissioning of gate whichever comes first. OHI reserves the right to invoice for partial shipments.

All parts manufactured by Obermeyer Hydro are offered and guaranteed as outlined in standard OHI sales agreement. Items that are supplied, but not manufactured by Obermeyer Hydro, are covered by the original manufacturer's warranty.

Sincerely,
Obermeyer Hydro, Inc.
Robert Eckman
Vice President

SOLOMON GULCH, ALASKA
OHI BILL OF MATERIALS
SIZE: 5' x 450'
OCTOBER 22, 2010

COMPONENT DESCRIPTION	QUANTITY	EST WEIGHT/UNIT (POUNDS)	TOTAL WEIGHT
GATE SYSTEM			
GATE PANEL (19.56' SECTION)	23	4200	96600
HINGE RETAINER A	450	4	1800
WEB RETAINER A	46	12	552
WEB RETAINER B	46	12	552
RESTRAINING STRAP CLAMP	138	20	2760
SPLITTER	23	7	161
CLAMP CASTINGS	225	134	30150
STAINLESS STEEL ABUTMENT PLATE	2	1500	3000
1/2"-13UNC x 1-1/4" STAINLESS STEEL HEX BOLT (SPLITTER BAR)	50	0.2	10
1/2"-13UNC STAINLESS STEEL FLAT WASHER (SPLITTER BAR)	50	0.2	10
3/4"-10UNC SS HEX NUT (HINGE FLAP)	1800	0.2	360
3/4" SS FLAT WASHER (HINGE FLAP)	1800	0.2	360
5/8"-11UNC SS HEX NUT (SEALS)	560	0.2	112
5/8" SS FLAT WASHER (SEALS)	560	0.2	112
1"-8UNC x 4" STAINLESS STEEL HEX HEAD CAP SCREW (RESTRAINING STRAP)	70	2	140
1"-8UNC SS HEX NUT (RESTRAINING STRAP)	140	0.5	70
1" SS FLAT WASHER (RESTRAINING STRAP)	210	0.25	52.5
1" x 12" 304 STAINLESS STEEL ANCHOR BOLTS (REST. STRAP)	70	15	1050
1-3/4" x 24" STAINLESS STEEL ANCHOR BOLT (MAIN ANCHOR)	450	19	8550
1-3/4" STAINLESS STEEL SPERHICAL HEX NUT (MAIN ANCHOR)	450	3	1350
1-3/4" STAINLESS STEEL SPHERICAL WASHER	450	3	1350
AIR BLADDER (19.56' DUAL CHAMBER)	23	710	16330
HINGE FLAP (19.56' SECTION)	23	90	2070
RESTRAINING STRAP	70	25	1750
ABUTMENT SEAL	2	25	50
INTERPANEL SEAL	22	25	550
INTERBLADDER SEAL	25	1	25
OHI 10-3 MECHANICAL CABINET (1-zone control system)	1	300	300
OHI 10-3 SQUARE D WATER LEVEL CONTROLLER	1	300	300
KPSI WATER LEVEL TRANSDUCER WITH 50' CABLE	1	25	25
OHI TSM-005 GATE POSITION SENSOR WITH 50' CABLE	2	25	50
INGERSALL RAND UP6-30-125 ROTARY SCREW AIR COMPRESSOR	2	1292	2584
INGERSALL RAND D221IM AIR DRYER	2	198	396
INGERSALL RAND GP216 AIR FILTER	4	25	100
INGERSALL RAND HE216 AIR FILTER	4	25	100
400-GALLON RECEIVER TANK	1	500	500
AIR CONNECTION ASSEMBLY	23	1	23
GATE SYSTEM TOTAL			**174254.5**

END