Hydroelectric Project Risk Analysis & the Bradley Lake Funding Model

Summary Report

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INTRODUCTION

The State of Alaska is analyzing the Susitna and Chakachamna hydroelectric projects for possible development. Both projects would require the investment of substantial resources and capital to move to the construction phase, including time and costs associated with an environmental review and the Federal permitting and licensing process. As part of the information gathering process, SNW has been asked to perform the following specific work tasks:

1. List and, if possible, assess the potential risks from an investor's perspective of the Susitna and Chakachamna hydroelectric projects.
2. Research, compare and contrast the Bradley Lake project and its original funding mechanisms to a potential similar project today.

Context for the Risk Assessment Component of This Report

Currently, there are several large hydroelectric facilities being constructed around the world. Many of these projects are being built in the BRIC nations (Brazil, Russia, India and China), where there are fewer permitting and environmental challenges to overcome. Nearly all projects of the size and scope of Susitna and Chakachamna currently being developed internationally are structured with some amount of government assistance or government guaranty, and many also include an equity investor participant. Some examples include China's Three Gorges, BC Canada's Toba Montrose, BC Canada's Waneta Expansion, Thailand/Laos' Pak Chom and Ban Koum projects (similar size/costs), and Brazil's Santo Antonio. The Waneta Expansion project financing is typical of the structures used to develop large hydro electric facilities; a more detailed description follows:

Waneta Expansion Project Description

Fortis Inc., an electric utility holding company, has entered into a partnership with Columbia Basin Trust (CBT) and Columbia Power Corporation (CPC), both 100% owned corporations of the Government of British Columbia, to construct a $900 million 335 megawatt hydroelectric generating facility on the Pend d'Oreille River, near Trail, British Columbia. The partnership calls for Fortis to own and operate 51% of the non-regulated portion of the facility and the CBT/CP group to own and operate the other 49% of the Waneta Expansion Project. The energy generated by the project will be sold to BC Hydro under a long-term power purchase contract. The surplus capacity will be sold to FortisBC under a long-term capacity purchase agreement. Fortis' portion of the initial financing costs are expected to be covered through credit facilities and then through long-term debt and equity take-out financing. The CPC portion is being funded through a $500 million commitment to be used as equity funding for joint venture power projects. Construction on the Waneta Expansion Project is expected to last four and a half years.

One important distinction between the large generation projects being constructed globally and the projects under consideration in Alaska is that the projects being built globally have access to large populations via transmission grids. This ability to both serve the immediate power consumption needs within the facility's service area and have access to other markets via a transmission system improves the baseline feasibility of a power generation facility and creates the option to develop excess capacity, which can be sold at market rates. Without state or federal support, Alaska's isolated geographic location eliminates the ability to build capacity which, when added to the current generation capabilities within the railbelt, exceeds existing demand.

It is the isolated geographic location of the railbelt customer base, in combination with the scope and complexity of the Chakachamna and Susitna projects, that lead us to conclude that neither of these facilities can be completed through a project finance vehicle (i.e., the security for the financing would be exclusively revenue from the sale of project-generated power). In our view, these projects will require State funding, which could be directly via capital investment and/or indirectly through some form of credit support or backstop, in order to obtain securities market access. It is also our view that it is reasonable for the State to consider investing in railbelt generation assets with the objective of developing a long-term stable source of base load power at a cost that will promote economic stability and growth within the railbelt region. Nevertheless, the process the State should go through in determining whether to invest additional time and resources into either the Susitna or Chakachamna project is analogous to the diligence that an equity investor would perform prior to the commitment of capital.

The following section identifies many of the risks inherent to an investment in either the Susitna or Chakachamna project. SNW is not qualified to advise AEA on the susceptibility of Susitna or Chakachamna to most of the risks identified. Many of these risks are focused on engineering or geological elements specific to the projects, and we are not an engineering firm. For this reason, we have confined our work to just the identification and explanation of risks, and for the most part have withheld any opinion as to whether either of the projects is more or less susceptible to a particular risk. The State, with its engineering and geotechnical resources and significant history with each of these proposed facilities, is in the best position to risk-weight the projects. Our objective is to help to identify as many of the project risks as possible and provide some framework to assist AEA with its risk assessment.

FINANCING CRITERIA: DISTINGUISHING RISK

Through a review of publicly available websites and documents footnoted or sourced throughout this report, we have evaluated and categorized some of the different risks associated with the two selected projects. As with the analysis of any project finance type structure, an investor will rely on a project feasibility study to outline the various engineering risk factors and risk mitigation efforts that are being undertaken throughout the stages of project development. SNW has not specifically studied nor are we suited to evaluate the two projects with respect to the different types of geological, volcanic, environmental risks, etc. from an engineering perspective. However, it is these risks that primarily distinguish Susitna and Chakachamna from one another.

Some potential risk factors are discussed below:

Overall Project Timeline

Both Susitna and Chakachamna are expected to take multiple years to permit and construct. The phased execution of the projects over multiple years has the effect of amplifying the elements of construction risk and reducing the overall confidence in project feasibility. Specifically with regard to Susitna and Chakachamna, the remote location of the projects will also be a factor in timely completion of the projects and therefore project feasibility. A large risk factor associated with either project is the unknown site or geological issues that could materialize during the construction phase. All other factors being equal, a shorter project permitting process and construction timeline is likely to result in less project risk.

Permitting and Licensing

There will be significant permitting risk, at both the Federal and local/State level. Projects of this scope and size would expect strong environmental opposition to the facility, transmission lines, roads (even if only temporary), and/or railroads. Any project financing would occur only after all permits/licenses were issued and all court challenges were exhausted, so investment of capital leading to the permitting of either project will be substantial. Any risk assessment of the projects under consideration based on permitting and licensing should be done while simultaneously considering the feasibility of construction and the long-term operating viability of the project.

Development/Pre-construction

There is a significant portion of pre-construction development work that needs to be completed, at a sizable cost. These expenditures are rarely risks that investors will carry. Pre-construction costs would have to be paid by the State or an independent developer.

Construction Risk

Both the Chakachamna and Susitna projects are subject to a variety of construction risks. The three primary credit concerns relating to construction include (1) the cost of the project, (2) the schedule for the project, and (3) the quality of the completed project. Each can negatively impact the availability of funding and/or the date that the project comes on-line and begins producing revenue.

Project cost risk is influenced by a whole host of risks inherent to both projects in various degrees. As noted above, the duration of construction can amplify the risk of many of these cost factors. Some of the risk elements that can influence project cost are:

Inflation Risk. The risk that the future cost of materials and/or labor will exceed estimates.

Supply Risk. The risk that materials required for construction will be unavailable due to competing construction demand and/or the inability to deliver materials to the job site due to a remote location or problems along the supply route.

Labor Risk. The risk that there will be either a shortage of the labor required to move the project forward on schedule or a work stoppage delaying completion.

Engineering Risk. The risk that the project will encounter unanticipated and/or under-estimated construction challenges. While we are not an engineering firm, it is our understanding that many large project cost overruns are caused by unforeseen underground conditions. The scope and nature of underground work at both Susitna and Chakachamna should be carefully assessed and factored into overall project feasibility.

Contractor Risk. The risk that a contractor will fail to perform on its contractual obligations. This risk can be mitigated by allocating construction risks among the various project participants through the use of design/build contracts and the implementation of fixed price/fixed schedule agreements, and by including price incentives and disincentives in construction contracts. Nevertheless, it is impossible to completely insulate a project from contractor risk, and the overall complexity of the project including project sighting and engineering should be factored into the risk assessment.

Geological Risk Factors

There are significant potential geological risks associated with the two projects, which have been identified and discussed in the following documents:

Susitna Project, Watana and High Devil Canyon – RCC Dam Cost Evaluation, prepared by R&M Consultants, Hatch Acres, and Jack Linnard Consulting (which sourced two other studies including *1982 Feasibility Study* (Acres), and *1983 License Application* (Harza Ebasco 1983)).

Chakachamna Hydroelectric Project – Interim Feasibility Assessment Report, prepared by Bechtel Civil & Minerals Inc., 1983.

Both projects entail significant project risk and it is our opinion that the risks associated with both projects would require substantial financial backing in the form of credit support from the State to be feasible. For Chakachamna, the potential implications of Mt. Spurr volcanic activity, the close proximity of the Castle Mountain fault, and the geological nature of the lake tap would be significant areas of concern for investors. From a capital markets perspective, and not based on any engineering expertise, it is our opinion that the seismic and geological risk factors connected to the Susitna project seem to be considerably less than Chakachamna, nevertheless Susitna will demand extensive seismic and geological analysis prior to obtaining outside capital funding.

Environmental (Fish, Plant, Wildlife) Risk Factors

Both projects will incur environmental issues in the form of fish passage, changes in water quality and temperature, vegetation removal, wildlife habitat loss or alteration, and reservoir fluctuations. These risks may not be limited to the construction period. Post-construction environment risk could materialize due to an unanticipated environmental impact. Again, based solely on our capital markets perspective, the design of the Chakachamna project, which will necessitate the diversion of water flow from one drainage to another, appears to have the increased potential for environmental risk, particularly the potential for post-construction environmental damage and possible corresponding operating risk.

Regulatory/Legal Risk Factors

While there are significant federal hurdles associated with the permitting of a hydro project (of any size), there have been some recent positive legal developments out of Washington, D.C. The U.S. Department of Energy, Department of Interior, and the Army Corps of Engineers recently signed a Memorandum of Understanding intended to promote the development of hydropower in the United States. The MOU is intended to increase cooperation among the different agencies and to integrate policies and procedures at the federal level. This potentially creates efficiencies through the regulatory approval process and an improvement in the time frame in which required approvals are obtained.

Notwithstanding the above, it would be a mistake to proceed with either project under the assumption that there is no political risk. While politically stable, the United States has a long history of changing rules and regulations due to a political shift in governance or general public sentiment.

Technology Risk

Hydro is a tried and true technology capable of providing very stable base load power, but it is capital-intensive. The possibility of technological improvements in other sources of base load power leading to greater output, lower environmental impact, and reduced generation and transmission costs would be a factor for any investor. This risk factor can be mitigated through the structure of the Power Purchase Agreement.

BRADLEY LAKE COMPARISON ANALYSIS

Description and History

The Bradley Lake Hydroelectric Project is located in south-central Alaska at the southern end of the Kenai Peninsula. The project includes a 610–feet-long, 125–feet-high concrete-faced and rock-filled gravity dam, a 3.5-mile power tunnel and a steel-lined penstock. The project has 126 megawatts of installed capacity. Two

20-mile, 115-kilovolt transmission lines connect the project to a transmission system on the Kenai Peninsula. The project provides electric power to the most populous areas of Alaska, including the Kenai Peninsula, the Municipality of Anchorage, the Matanuska-Susitna Borough, and the Fairbanks area. Under a Power Sale Agreement, AEA has sold 100% of the capacity to the following purchasers:

- Chugach Electric Association, Inc. (30.4%);
- Municipality of Anchorage (25.9%);
- Alaska Electric Generation & Transmission Cooperative, Inc. (25.8%) acting on behalf of Homer Electric Association, Inc. (12.0%) and Matanuska Electric Association, Inc. (13.8%);
- Golden Valley Electric Association, Inc. (16.9%); and
- City of Seward (1.0%).[1]

The power generation potential of Bradley Lake was first studied by the U.S. Corps of Engineers and presented in a report dated March 1955. The project was authorized by Congress in 1962, but, despite its feasibility, federal funds were not available for its construction. The Alaska Energy Authority (then Alaska Power Authority) assumed responsibility for the project in 1982. Preliminary plans and field investigations started in 1982. In April 1984, AEA submitted a license application to the Federal Energy Regulatory Commission. The FERC license is the primary regulatory approval governing project development. The license to construct the project was issued on December 31, 1985, under the Energy Program for Alaska. In addition to the FERC license, AEA applied for and received 170 federal, State and local permits and licenses required to support construction and operations. A number of studies and investigations were performed to ascertain the geologic and geotechnical conditions of the site and structures. Seismic design considerations and the results of the investigations were reviewed and found prudent by the projects' technical review board and the FERC board of consultants.[2] In addition, a number of environmental studies were done, including studies of the effects of the project on wildlife, fish and winter ice conditions.[3] Construction of the project commenced on June 17, 1986, with site preparation work. Construction was suspended, however, after the completion of Phase I in May 1987 due to the pending negotiations of a satisfactory power sales agreement. In December 1987, AEA and the railbelt utilities entered into a Power Sales Agreement, and legislation was introduced in January 1988 to exempt the Bradley Lake power sales agreements from review by the Alaska Public Utilities Commission.[4] Construction of the project resumed on March 12, 1988, and the project was declared in commercial operation on September 1, 1991. From the project's completion in 1991 through 2009, the project has had an average annual output of 386.4 million kilowatt hours.

Original Financing

Project cost in the amount of $357.2 million (including reserves, capitalized interest, and cost of debt issuance) was funded long-term by (1) appropriations from the State in the initial aggregate amount of $175 million (later reduced to $163.6 million), (2) proceeds from the sale of AEA's bonds issued in the amount of $165.3 million, and (3) approximately $28.3 million of interest earnings during construction. A portion of the

[1] Alaska Energy Authority Bradley Lake Hydroelectric Project Fact Sheet (2010)
[2] Alaska Energy Authority Power Revenue Bonds, Second Series Official Statement (1990)
[3] "Throwing the switch at Bradley Lake," Alaska Business Monthly (1991)
[4] "Throwing the switch at Bradley Lake," Alaska Business Monthly (1991)

State appropriations funding was provided by the Railbelt Energy Fund, which was established from the Power Development Fund and seeded with appropriations for the canceled Susitna Hydroelectric Project.[5]

AEA issued approximately $267.5 million of Variable Rate Demand Bonds during the project construction phase to be used for construction cost. The Variable Rate Demand Bonds were sized in an amount that, together with interest earnings, would be sufficient to completely cover construction of the project. This approach created the ability to earn the maximum amount of interest earnings during construction. The Variable Rate Demand Bonds were general obligations of AEA and were secured by bank letters of credit and a capital reserve fund under an Indenture of Trust from AEA to the Bank of New York. Following construction, the Variable Rate Demand Bonds were redeemed using a combination of State-appropriated funds and the proceeds of long-term, fixed rate bonds issued in the amount of $165.3 million. The initial bond sales were issued in very flat yield curve environments, with interest rates ranging from 6.1% on the short end to 7.25% on the long end.[6] The original financing plan for the project is outlined in the table below:

FINANCING PLAN FOR BRADLEY LAKE

Available Funds		
Long-Term Bond Issuances	$ 165,260,157	
State Appropriations	163,605,157	*
Interest Earnings from VRDBs	28,375,379	
Total	$ 357,240,693	
Application of Funds		
Project Construction	$ 312,500,000	
Capitalized Interest	17,418,182	
Capital Reserve Fund	13,392,890	
Renewal and Contingency Fund	5,000,000	
Bond Insurance Premiums	1,302,839	
Bond Issuance Expenses	3,339,175	
Operating Reserve Account	625,000	
Net Original Issue Discount	3,662,607	
Total	$ 357,240,693	

* The original appropriation was in the amount of $175,080,000, but $11,474,843 was refunded to the State after construction.

[5] "Allure of the Railbelt Energy Fund," Alaska Business Monthly (1990)

[6] Electronic Municipal Market Access and Alaska Energy Authority Power Revenue Bonds, Second Series Official Statement (1990)

The Variable Rate Demand Bonds were refunded through two long-term issuances, the first in 1989 in the amount of $105 million and the second in 1990 in the amount of $60,259,015. The sources and uses for the permanent financing of the project are outlined in the table below.

	1st Series Revenue Bonds	2nd Series Revenue Bonds	Total
Sources			
Principal Amount of Bonds	$ 105,001,142	$ 60,259,015	$ 165,260,157
Existing Funds*	100,000	227,848,767	227,948,767
Total	$ 105,101,142	$ 288,107,782	$ 393,208,924
Uses			
Redemption of Variable Rate Demand Bonds	$ 76,600,000	$ 190,900,000	$ 267,500,000
Deposit to Construction Fund	-	82,300,919	82,300,919
Deposit to Interest Account	12,245,356	3,840,138	16,085,494
Deposit to Capital Reserve Fund	8,423,148	4,969,742	13,392,890
Deposit to Renewal and Contingency Reserve Fund	1,524,466	3,475,534	5,000,000
Deposit to Operating Reserve Account	-	625,000	625,000
Bond Insurance Premium	798,839	504,000	1,302,839
Underwriting Discount and Costs of Issuance	2,030,445	1,308,730	3,339,175
Net Original Issue Discount	3,478,888	183,719	3,662,607
Total	$ 105,101,142	$ 288,107,782	$ 393,208,924

Comparison of Current Financing Environment

The project was an innovative deal at the time that it was originally built and financed, and was the first instance of a state agency financing a power project on a long-term basis.[7] While the current financing environment is very different from that of 25 years ago, when the project was developed, the size, scope and success of the project makes it a relevant standard to analyze when considering a comparable large scale hydroelectric project. For this comparison, we have focused on highlighting the key components of the original financing relative to what could be expected in today's market. These components include:

- Arbitrage and investment earnings
- Rate environment and pricing
- Equity
- Security
- Power sales agreement
- Regulatory review and waivers
- Financing terms and conditions

Arbitrage and Investment Earnings: During the construction phase of the Bradley Lake project $267.5 million of Variable Rate Demand Bonds were utilized as interim funding and were later repaid through the

[7] Alaska House Judiciary Committee, Action Narrative, January 26, 1988. Tape 88 Side 1.

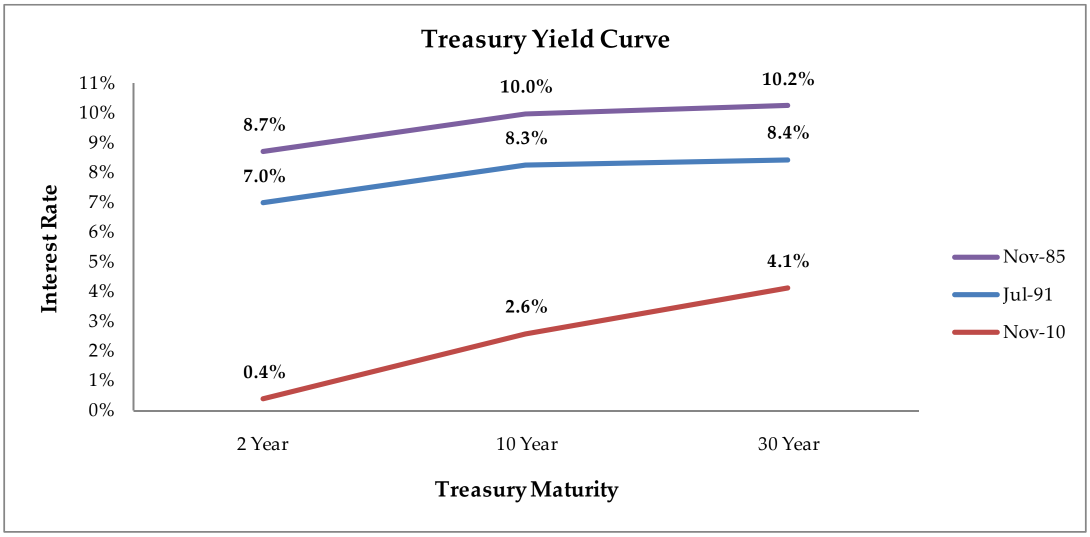
combination of State appropriations, which, in effect, acted as equity in the transaction, and long-term fixed rate revenue bonds, which would be backed by the power sale agreement. One significant aspect of variable rate demand bonds issued at the time is that, because they were issued prior to the Tax Reform Act of 1986, unspent proceeds from the bonds could be invested at a higher, taxable rate of interest. This interest rate arbitrage was used as additional source of capital for the project. Investment earnings on this arbitrage over the life of the Bradley Lake variable rate demand bonds equaled $28.3 million or approximately 9.0% of the total project costs. The 1986 Tax Act eliminated any ability to use tax-exempt bond proceeds to earn interest arbitrage, so interest rate arbitrage would not be available for a similar transaction today.

Rate Environment and Pricing: The 1980s saw a declining interest rate environment with relatively flat yield curves. While rates did not decrease in a linear fashion, due to some volatility in the decade, the overall rate decrease was fairly dramatic. For example, the 10-year treasury rate went from almost 15% in 1981 to around 8% in 1989, while the 2-year treasury rate went from almost 16% to around 8% over the same period. Long-term rates were in the 10% range in 1985 when the variable rate demand bonds were issued. The permanent take-out bonds were issued on a serial basis, with interest rates ranging from 6.10% on the short end to 7.25% on the long end. This environment is very different from the one we are currently experiencing, with historically low rates and a very steep yield curve. Rates on the 2-year treasury are currently 0.38%, while the 30-year treasury is around 4.12%.

The combination of historically high long-term tax exempt interest rates and a declining interest rate environment made variable rate bonds during the construction phase of Bradley Lake a good choice. As noted above, prior to being expended on the project, proceeds of bonds issued during the construction phase were invested above the variable rate cost of capital, creating interest earnings that exceeded the interest cost of the construction financing. The Bradley Lake funding structure took full advantage of the arbitrage strategy by borrowing for the full amount of the project, including the amount that was expected to be loaned by the State.

Additionally, the use of variable rate bonds served to minimize borrowing cost during construction. As bond proceeds were expended and therefore no longer able to be invested to create arbitrage earnings, the cost of interest was minimized since, in the typical upward-sloping yield curve environment, short-term variable rates were lower than long-term fixed rates. The combination of arbitrage earnings and low rates once bond proceeds were spent served to lower the funding cost of the project during the construction phase.

The Bradley Lake funding cost was additionally benefitted by falling rates during the construction period. As construction wrapped up, the variable rate bonds were refinanced with long-term fixed rate bonds in a lower interest rate environment than the long-term rate environment that existed when the project was started, as illustrated in the table below.



Interest rate risk is always a concern for project feasibility. Rising rates during project construction can substantially jeopardize project feasibility. By utilizing variable rate funding during the construction phase of the project, Bradley Lake was exposed to rate risk; however, this was a calculated risk, since the project was started in a high interest rate environment. Variable rate funding could also be a tool utilized to finance either Susitna or Chakachamna to provide extremely low-cost capital during the construction phase. Of course, the projects would be exposed to interest rate risk until the long-term fixed rate funding is secured. Contrary to 1985, today's long-term interest rates are historically low, creating an incentive to use fixed rate funding during the construction phase and eliminate the risk of rising rates.

While eliminating rate risk, fixed rate funding would likely result in additional cost in the form of negative arbitrage, or the inability to invest construction proceeds at or above the long-term borrowing rate, during the construction phase. Since negative arbitrage would only exist during the construction phase, it should be considered as an additional cost that, at least in the current rate environment, is outweighed by the risk of rising rates.

Equity: Another key component of the Bradley Lake funding structure was the large percentage of equity that was provided through appropriations from the State. State appropriations for the project ended up accounting for approximately 50% of the total project costs. The State's participation in the Bradley Lake project allowed the substantial capital cost of the project to be spread over a period of time that exceeded what would have been available through the bond market.

Security: The Variable Rate Demand Bonds were backed by a letter of credit as well as a general obligation of AEA. The permanent take out bonds were backed by revenues of the power sale agreement, the general obligation and full faith and credit of AEA as well as a moral obligation of the State. In today's environment, an investor would expect to see at least this level of credit support for a deal of this size and complexity.

Power Sales Agreement: The power sale agreement is simply the business deal between the power generator and the power purchaser and can be used to shift risk from the generator/developer to the power purchaser. The power sale agreement in the Bradley Lake project was heavily negotiated by the various parties and at one point was actually the cause of a significant construction delay on the project.[8] As the main source of payment and security, the power sale agreement was integral in arranging the permanent financing. A unique attribute

[8] Throwing the Switch at Bradley, Alaska Business Monthly (1991)

of the Bradley Lake power sale agreement was that the agreed payments continued for an additional 20 years after bonds used to fund the project were scheduled to be retired. This structure was designed to repay the State for the considerable capital that was contributed to the project but also served to extend the time frame for amortizing the cost the project.[9] SNW believes that this aspect of the Bradley Lake contract has applicability to future generating projects within the railbelt.

Regulatory Review and Waivers: While no one would argue that the Bradley Lake project was fast tracked, given the time spent on analysis and the rigorous regulation process that was required, two key waivers were obtained in the process. The first was a special federal exemption that allowed the project to use tax-exempt financing despite the fact that it would serve three contiguous counties. Normally, private activity bonds for electric facilities are exempt only if the facilities are used by a utility serving no more than two contiguous counties. Secondly, the sale and purchase agreement was exempt from APUC review, which removed a great deal of uncertainty within the investor community and seems to have been instrumental in moving the project forward at a critical juncture in time.[10] While these specific waivers may not be necessary for a similar project in today's environment, it is important to remember that a project of this size and scope has the potential to require various agencies and levels of the public sector to work together to achieve success.

Financing Terms

The tables below outline the key terms and conditions achieved in the Bradley Lake financings compared to what might be achievable for a similar project today.

[9] Alaska House Judiciary Committee, Action Narrative, January 26, 1988; tape 88 side 1

[10] Alaska House Judiciary Committee, Action Narrative, January 26, 1988; tape 88 side 1

INITIAL CONSTRUCTION FINANCING

FUNDING MECHANISMS	ORIGINAL BRADLEY LAKE PROJECT	POTENTIAL PROJECT TODAY
Construction Costs	$312,500,000	Dependent on project
Equity (State Allocation)	$175,000,000	Likely to be greater than 50% or more of total project cost
Interim Financing	Variable Rate Demand Bonds	State funding potentially in combination with conventional bond funding
Amount of Bonds	$267,500,000	Dependent on project
Date Issued	11/20/1985	Dependent on project
Use of Funds	Construction	Permitting, licensing, construction
Security	General Obligation of the Authority, Letter of Credit and Capital Reserve	Dependent on project; however, for a large scale project, investors would expect to see significant credit support
Financing Costs		Dependent on project
Interest Rate	Variable Rate	Dependent on security, interest rate environment, tax-status, size, credit rating
Letter of Credit	Required	Possible requirement
Capital Reserve	Required	Necessary requirement
Completion Bonds	Allowed without compliance	-

PERMANENT TAKE-OUT FINANCING

FUNDING MECHANISMS	ORIGINAL BRADLEY LAKE PROJECT	POTENTIAL PROJECT TODAY
Bond Resolution	Maximum of $175,000,000	-
Par Amount Issued	$165,260,157 $105,001,142 Series 1 $60,259,015 Series 2	-
Credit Rating	Moody's Aaa (enhanced) S&P AAA (enhanced)	-
Type	Negotiated / Tax Exempt	-
Underwriters	John Nuveen & Co; Goldman Sachs; Merrill Lynch; Paine Webber; and Lehman Brothers	-
Dates Issued	9/1/1989 Series 1 7/15/1990 Series 2	-
Use of Funds	Refund VRDB and capitalize reserve funds	-
Financing Costs		-
Interest Rate		-
Security for Bonds	Direct and general obligations and full faith and credit of the Authority and revenues received from operation of the project under Power Purchase Agreement	-
Insurance	Yes and provided by MBIAC	-
Power Purchase Agreement	Five utilities purchase 100% of Annual Project Costs, including debt service and annual reserves	Likely different structure than Bradley Lake, but there will need to be a strong PPA in place between the project owner and the railbelt utilities
Power Purchase Default	If insufficient funds available because of payment default of Power Purchaser, ADA may increase each other Power Purchaser's share of costs up to 25%	Step-up provision in the PPA will be a necessary security structure feature; however, it could be structured differently than Bradley Lake
Capital Reserve Fund	Equal to Maximum Aggregate Debt Service	Required, but could be structured differently than Bradley Lake
State Obligation	Moral obligation of the State to restore Capital Reserve Fund	Will depend on PPA structure, but State pledge of any kind would benefit the credit
Completion Bonds	Allowed on parity	Yes, typically up to 10% of original bonds issued to fund the project
Additional Bonds	May be issued on parity for the cost of acquisition and construction of any capital improvement related to the project with approval from the project	Dependent upon type of debt. It is not typical to allow additional bonds for a project revenue bond structure however system debt would permit additional bonds

	management committee as well as proof that the additional bonds will not hinder debt service payments on the original bonds	subject to meeting certain financial thresholds. Bradley Lake is a hybrid additional bonds provision.
Consultant Engineer	Report estimating the projected costs and revenue requirements for a 10-year period as well as opinions on the project	Required
Renewal and Contingency Reserve Fund	Yes	Required
Operating Reserve Account	Yes	Required
Optional Redemption	102% (7/1/00-6/30/01) 101% (7/1/01-6/30/02) 100% (7/1/02 – thereafter)	Will depend on debt type. Taxable bonds would typically not permit optional redemption, while tax-exempt bonds would allow for optional redemption.
Notice of Redemption	At least 30 days but no more than 60 days	-

State Financial Assistance

As identified in previous reports[11] discussing potential financing structures for large generation assets, State financial assistance in a form similar to the Bradley Lake project model will be a necessary tool for either of the potential hydroelectric projects being evaluated. State financial assistance offers a number of advantages not available through traditional utility enterprise bond funding or project finance. State funding, whether in the form of a grant or loan, can be utilized to defer higher cost conventional revenue bond funding. Obviously a grant from the State provides the cheapest form of capital, but even when structured as a loan, State assistance can dramatically lower the overall cost of capital. State funding in the form of a loan has three significant advantages when compared to revenue bonds or a loan from a commercial lender:

Repayment flexibility. State funding can be utilized to extend debt repayment beyond the terms available in the public or commercial debt capital markets. Additionally, a State loan can easily be restructured or deferred to achieve system rate objectives.

Credit support/risk mitigation. State funding can be used to mitigate project construction risk to investors. This is particularly relevant for projects with extended construction timelines, such as the Susitna or Chakachamna hydro projects. Risk mitigation is also relevant in situations where permitting is an issue or a new technology is being used. As discussed earlier, investors will not accept the significant construction and permitting risks inherent with large-scale projects without some form of support from the State.

Potential interest cost benefit. State funding can provide a lower cost source of capital. The State's high investment grade credit rating allows it to borrow for less than even the most secure utility enterprise, and this lower borrowing cost can be passed on to the project. Alternatively, the State can use cash reserves to invest in a large-scale generation project like Susitna or Chakachamna. By using a funding model similar to Bradley Lake's, this capital investment can be returned to the State over an extended period of time. Extending the return of capital to a term that more closely matches the useful

[11] Regional Integrated Resource Plan – Financial Analysis Summary Report, 2/3/2010

life of the asset lowers the rates and charges for utility customers and spreads the capital cost of the project over a larger customer base.

CONCLUSION

In conclusion, SNW does not believe that it is possible to differentiate between the Susitna and Chakachamna projects on the basis of capital markets access. As we have underscored in this report, the scope of both projects, combined with the unique nature of the railbelt region, will necessitate a funding structure for either project that is supported by State credit or a State capital commitment. We think that it is likely that we would reach this same conclusion for any project with similar complexity and cost developed within the railbelt. There are engineering, geotechnical and seismic factors specific to each of the projects that would be relevant for the State to consider in risk weighting the projects prior to investing additional time and resources in further development. We've highlighted some of those risks in this report but do not have the technical expertise to advise AEA on the importance of these risks.

Finally, we believe that elements of the Bradley Lake funding model have applicability to funding new large hydroelectric facilities within the railbelt. Market conditions and the legal constraints under which any new project would be funded are dramatically different than when Bradley Lake was funded, so the Bradley Lake structure cannot be replicated as a whole. However, the ability to collaborate with the State to mitigate certain risks and spread the capital cost over an extended period of time will be critical to funding a multi-billion dollar project.