



September 3, 2015

ALASKA INDUSTRIAL DEVELOPMENT & EXPORT AUTHORITY
Attention: Tom Erickson
813 W. Northern Lights Blvd.
Anchorage, AK 99503

Re: Interior Energy Project (IEP) RFP Number: 15142
Spectrum LNG, LLC 5 Page IEP Summary

Dear Mr. Erickson,

Attached is the response from Spectrum LNG, LLC to your August 27, 2015 request for a 5 page summary of the Spectrum project. As we understand this is the only required deliverable prior to the Spectrum RFP Feedback Meeting scheduled for Thursday September 10, 2015 at noon in the AIDEA offices.

Please respond and confirm that AIDEA has received this electronic submittal from Spectrum LNG, LLC.

Thank you and we are looking forward to the RFP Feedback Meeting.

Respectively Submitted,

A handwritten signature in blue ink that reads "Keith Hand". The signature is written in a cursive, flowing style.

Keith Hand
CFO

Spectrum LNG, LLC

Proposal Summary

Spectrum LNG, LLC (Spectrum) proposed two separate development locations at sites where we have already performed preliminary permitting and design work. The location for a Cook Inlet supplied project is on property we own and is adjacent to the LNG plant we developed in the '90's now known as the Titan LNG plant. The Prudhoe Bay location is the site we leased and subsequently transferred to AIDEA in 2014.

Our analysis indicates that the Prudhoe Bay site will deliver cheaper gas to Fairbanks by a significant margin. Since the stated goal of the Interior Energy Project (IEP) is to serve the most at the least cost, we presume AIDEA has requested a summary of the Prudhoe Bay project, which was the focus of our response to AIDEA's RFP 15142.

Spectrum's proposal is largely along the lines of its original development plans for the Prudhoe Bay site. The significant difference is the financing of the capital cost of the project. What remains unchanged is our belief that the project will only succeed in serving the most for the least if GVEA participates by using LNG for fueling its North Pole power plant. Absent this desirable base load to average down the seasonal demand swing, the IEP will be forced to either over build LNG storage in Fairbanks or plant capacity in Prudhoe Bay. Either way, the cost of service to the end user is increased. Therefor Spectrum has continued to negotiate with GVEA for an offtake agreement.

Recently GVEA requested a specific proposal from Spectrum. In their request, GVEA specified their preference for how the plant should be financed and the capacity of the plant. Specifically they requested that the plant size match what was specified in AIDEA's RFP and that the grant funding be used preferentially to the SETS funding and no private equity capital be used. This capital stack would insure the cheapest possible liquefaction costs.

Spectrum selected a plant design that provides the ability to take full advantage of the ambient temperature swing in Prudhoe so during the winter period the plant will produce significantly more than summer, matching the demand curve for the heating load in Fairbanks. This design reduces the amount of storage needed in Fairbanks and reduces the increased plant capacity required to meet the peak winter demand. This is the same design we built and operate daily at Spectrum's Ehrenberg Arizona Plant so there is no design risk associated with it.

Our engineering modeling to date on this project shows that each of the two trains will produce an annualized average of 121,000 gallons per day for a total of close to 7 Bcf/year of liquefaction capacity. While this volume is slightly more that AIDEA requested in the RFP, it is built around Cat 3612 model engines for compression power.

In summary Spectrum designed its proposal to reduce CAPEX both in the plant construction and other areas such as LNG storage in Fairbanks for the IEP and tailored the capital stack according to the wishes of the largest potential customer. This approach is the **most consistent approach possible with the goals of the IEP of serving the most for the least.**

Background and Experience of Proposer's Firm

Spectrum is the largest contract LNG producer in the US. We conceived, designed, built, own and operate our 65,000 gallon per day LNG plant in Ehrenberg, Arizona. This plant is in its 6th year of operation under a 10 year contract with Clean Energy Fuels Corp., the largest distributor of LNG in the US. We are expanding this plant and expect it to produce 100,000 gallons per day by mid 2016.

The principals of Spectrum have significant experience with LNG and natural gas plant design, construction and operation in Alaska including Prudhoe Bay. Spectrum's principals were the originator of the entire Fairbanks Natural Gas, Co. and Pt. MacKenzie LNG plant development and supply chain. This included the pioneering repurposing of a natural gas liquids plant into an LNG plant and all aspects of the development and startup of the project.

Spectrum was shortlisted by AIDEA in its original IEP RFP to provide LNG. Later AIDEA purchased Spectrum's subsidiary Spectrum Alaska, LLC to take advantage of its advanced stage of development and optimum plant location in Prudhoe Bay. Spectrum selected this site and began developing it into a usable location for an LNG Plant in 2012, a year before SB23 was passed in 2013.

Last year we produced and shipped over 20,000,000 gallons of LNG. This year we are on track to produce 23,000,000.

Spectrum is likely the most seasoned LNG developer/operator responding to AIDEA's RFP and its principals have a long history of successful natural gas and liquid fuel projects in Alaska. In addition to Spectrum's broad experience we use superior contractors such as Conam Construction Company for field construction and project management as well as numerous specialty vendors such as SME Associates (SST in our proposal) for key process components. Spectrum's relationships with these vendors/suppliers span decades.

Project Description and Costs

Spectrum uses a cost model similar to a regulated utility model with the exception that the revenue requirement is negotiated and agreed to for 15 years. This model guarantees that as more customers convert to natural gas, the less expensive the service becomes for everyone. Any additional profit is essentially paid back directly to the customer in a form of lower gas prices the following year. Because no high cost equity requiring a 10-13% return is included in our preferred proposal, the **cost of gas delivered to the Fairbanks city gate is estimated to be below \$8/MMBtu** once the plant reaches full capacity (year 3 according to AIDEA's projections).

An open cycle turbo expander process has been selected for this application. This is the same process we use at our Arizona plant and used at the original Pt. MacKenzie LNG plant. Utilizing the gravel pad that AIDEA installed in Prudhoe Bay, the cost of our two train LNG plant is estimated at \$67.2 million to complete. Adding a \$6.7 million contingency and a \$6.1 million construction completion reserve, the total CAPEX budget is \$80 million.

Annual operating expenses for the Prudhoe Bay plant are \$4 million. This does not include property taxes, maintenance reserves, owner's risks and management fee which total \$3 million per year. The annual revenue requirement for the plant is \$7 million.

Spectrum has proposed a Capital structure that uses \$45 million in grant funding (capital appropriation) and \$35 million in SETS funding per GVEA's request. Spectrum believes the ultimate capital stack will be negotiated between AIDEA and GVEA. Ultimately the SETS debt service will be added to the annual revenue requirement. The SETS loan funds were assumed to have a zero interest rate as this would be most consistent with the stated goal of the IEP, serving the most for the least cost.

Timeline to First Gas

AIDEA has issued a schedule indicating they should complete negotiations with the recommended partner by November 30, 2015. We note that the AIDEA board has a scheduled meeting on December 3rd where we assume the board will act on the matter. So a start date of early December 2015 is assumed.

The major components required for the plant are very similar if not the same as those used for gas processing around the world. As a result of the major down turn in the oil and gas sector and based on recent quotes from major equipment vendors, lead times have shortened considerably. Conam Construction, our preferred construction contractor, has indicated that the most cost effective approach is to have a single mobilization that would begin in March 2016 with the installation of the gas pipeline to the pad site which requires a short ice road. The balance of the work can be scheduled so a steady, moderately sized work force can continue on site preparing for the arrival of major components in June through October. Interconnects will be completed in October/November with functional check out and start up in December of 2016. Sustained production will be established in December 2016/January 2017. At this point the critical path items are the two cold boxes. This schedule is only possible due to the reduced vendor lead times and an early December 2015 notice to proceed.

Currently Spectrum is only pursuing the liquefaction service component of the IEP. However we are experienced in all aspects of the overall project and fully understand and appreciate the necessity of coordination between production and consumption of the product. It will be of little benefit to the Interior to have production capacity available in Prudhoe Bay in January of 2017 if the LNG satellite facilities in Fairbanks are not ready to go into service. Therefore we suggest closely coordinating the ordering of the LNG storage equipment (tanks, etc.) for the Prudhoe Bay plant with the ordering of the tanks and vaporizers for the Fairbanks satellite plant. We envision this satellite to be constructed on GVEA's property adjacent to their North Pole power plant. Spectrum is also willing to coordinate the truck transportation and LNG trailers should we be selected to develop the LNG supply.

While GVEA has yet to agree to the Spectrum July 14th proposal, it is consistent with their request and just as importantly it follows GVEA's actions to date. GVEA purchased the land adjacent to the North Pole plant in anticipation of installing an LNG storage and vaporization satellite. GVEA negotiated a 15 year gas supply agreement for Prudhoe Bay gas. GVEA did participate with Flint

Hills, their long time fuel provider, and hired Chicago Bridge and Iron (CB&I) to perform a study about producing LNG in Prudhoe Bay. During this process CB&I selected the exact same plant location that Spectrum did, however Spectrum acted first and procured the lease at this desired location.

The satellite that GVEA needs to provide service to its power plant can use tanks similar to those that Spectrum will install at the Prudhoe Bay plant. This satellite will be able to provide additional service to meet the needs of both Interior Gas Utility and Fairbanks Natural Gas.

Major Assumptions / Financing Considerations

To minimize cost of gas to the consumers, 100% AIDEA funds were assumed. Equity is available from Spectrum, but would require a significantly higher return than AIDEA funds and would add directly to the price of gas with no additional benefit. Due to Spectrum's overall low project cost, the significant remaining AIDEA funds can be utilized for conversions and/or distribution pipe installation. It was assumed that \$45M of the grant funds were utilized with the balance in SETS loans at zero interest rates. Lower grant utilization of only \$25M is also possible, but the higher cost will be passed directly onto the consumers.

Spectrum has been adamant and vocal about the price of gas in Prudhoe Bay. GVEA negotiated a 15 year gas supply agreement with BP in 2012 to supply this project. The exact pricing is confidential but reported to be in the \$2.50 to \$3.75 range depending on the price of crude oil. Spectrum's principals have been party to many gas contracts beginning in 1986 with ARCO Alaska and Sohio Petroleum Co. On more than one occasion we purchased gas for \$1.00/MMBtu and believe this provides more than fair value to the producer considering the poor quality of the gas and the fact that it is stranded. However, the fewer remaining producers at the time of the BP/GVEA negotiations did not feel inclined to compete for the sale and thus the price reflects close to current Henry Hub pricing even though it is stranded and does not meet pipeline quality without expensive treating/purification.

A significant change has occurred since the execution of the BP/GVEA gas sales agreement. Hilcorp purchased certain producing assets from BP and has current gas production available for sale now. The market is beginning to behave as expected. We have been told that Hilcorp has agreed to sell gas on the North Slope for \$1.00/MMBtu. We attribute this to two factors. First, Hilcorp is a more nimble and competitive/profit driven company than the larger producers and second, the market may be increasing its belief that the IEP will actually become a reality and there is a more viable opportunity of actually making a sale. The point is, whether it is Hilcorp, BP, ConocoPhillips or EXXON as the IEP moves toward reality, the producers will give more serious consideration to pursuing the sale of gas, as this is how they make their money. The only lever that the producers have to differentiate themselves from each other is price.

Other factors are involved in the gas price. The Governor recently mentioned the potential for a reserves tax. Typically reserves taxes are not applied to those reserves that are under production. So the producers may have new motivation for making the sale. Also, given the political likelihood of another attempt to repeal SB21 to address the State's budget gap, the producers may be willing to help the IEP by providing a cheaper gas supply to the project in order to

generate badly needed goodwill. Finally, it is very unlikely that a producer such as Hilcorp would provide a cheaper gas supply exclusively to one aspiring LNG producer, rather the gas would be made available to any successful developer, i.e. AIDEA should not show preference between proposals based on price of gas when dealing with Prudhoe Bay liquefaction options. Ultimately the lowest priced producer will sell to the proposer AIDEA selects.

How the Proposed Project will meet / fit into the IEP Goals

The Spectrum proposal meets the goals of the IEP and betters the Governor's promise of \$10/MMBtu gas at the city gate valve. By utilizing only a portion of the SB23 capital appropriation and SETS loan funds, the LNG produced will be the most efficiently financed and therefore affordable to the most interior residents as quickly as possible.

Conclusion

Largely because we have done this project before, we best understand what is involved. As the entrepreneurs that founded the enterprise that made the first delivery and distribution of natural gas to Fairbanks we recall vividly the economic pain associated with slow market adoption/conversions. Given the current low oil price, this concern is just as real today as it was when we brought the first tanker of LNG to Fairbanks in 1997. No matter how many experts are hired to study the matter, the rate at which potential customers convert to becoming real customers is only known after the fact.

Spectrum wants to be involved with a successful Interior Energy Project. Building the most cost effective LNG plant in Prudhoe Bay without the rest of the chain also being successful is not something in which we wish to participate. This explains why we have consistently pursued GVEA as the needed base load customer. The IEP might succeed without the GVEA load, but it will not be nearly as successful as it could be with the base load from the GVEA power plant. Without this load, the IEP will have to overbuild either plant capacity or storage capacity, or both. This will increase the cost of service to the customer and lessen the motivation to convert. Having fewer customers to spread the cost only compounds the problem.

There is absolutely no substitute for experience. Spectrum has the most experience when it comes to making the IEP a reality. We have dealt with most every potential problem that can arise from this Alaskan LNG effort. From gas negotiations, pipeline connections, the nuts and bolts of liquefaction plants, trucking obstacles and logistics, storage and vaporization issues, RCA/APUC utility certifications, the installation of distribution piping and ultimately the conversion of customer equipment from oil to natural gas are all in our resume.

Our experience creating FNG was a technical success but an economic disappointment. Had we had any large base load customer such as GVEA, the IEP would not be needed today. We applied this lesson to our subsequent LNG project in Arizona by negotiating a ten year sales agreement with Clean Energy Fuels. We believe this is a very valuable lesson that should be applied to the present situation, especially in light of current oil prices.