



LARGE STORAGE TANK PROJECT

FAIRBANKS NATURAL GAS, LLC

PROJECT DEVELOPMENT PLAN

Describes the program to develop large LNG storage in Fairbanks to facilitate the expansion of natural gas distribution



LARGE STORAGE TANK PROJECT

INTRODUCTION

The Fairbanks Large Storage Tank is part of the Interior Energy Project (IEP) designed to expand natural gas distribution in Fairbanks and Interior Alaska. A tank with a capacity of 0.44 Bcf (5.25 million gallons) is desired. A five-million-gallon tank represents a 15 fold increase compared to FNG's current storage capacity. The new tank is part of a program that will develop new, larger capacity production facilities, larger tanker fleet, and expanded distribution system. The development of the production facility, tanker fleet, and distribution system are under separate cover.

PROJECT

The Fairbanks Large Storage Tank is a project ("the Project") to design, construct and startup storage, truck offloading, and vaporization facilities at an existing FNG facility in south Fairbanks, Alaska. The existing storage tanks will be decommissioned and re-purposed after startup of the new facility. New vaporization is required to handle the planned increased volumes of gas sent out from the tank. The new tank and vaporization equipment will be tied into the existing and expanded metering run and distribution header.

PROJECT DEVELOPMENT PLAN

This Project Development Plan describes the means, methods, and expenditures for accomplishing project goals. This plan will be updated periodically throughout the life of the project. This development plan may reference other agreements, contracts, and documents. In the event of conflict between the terms, conditions, and provisions of this Project Development Plan and any referenced document, the terms, conditions, and provisions of the referenced document shall control.

SCOPE

Preliminary Engineering

Preliminary engineering has evaluated the tank site for permit requirements, surrounding activity and zoning considerations, including vapor dispersion and thermal exclusion space. The vapor dispersion and thermal exclusion space requirements has determined the maximum size of the tank suitable for the site. Preliminary engineering developed a list of qualified tank bidders, identified a contracting plan, prepared requests for proposal for tank design and erection, determined site layout, conducted geotechnical investigation, analyzed the most cost-effective foundation design, and evaluated the bid results for tank design and erection.



LARGE STORAGE TANK PROJECT

Tank Design-Erect Contract

The LNG storage tank is a specialty item governed by several design codes including federal 49 CFR 193 – Safety Standards for LNG Facilities; NFPA 59A – Standard for Production, Storage and Handling of LNG; and API-620 – Standard for Design and Construction of Large, Welded, Low Pressure Storage Tanks.

The tank, its foundation and the site preparation will be designed and erected on a lump sum turnkey contract basis.

The bid specifications called for bidders to provide a refrigerated liquid tank suitable for storage of liquids at -325°F or warmer at a pressure of not more than 2.5 psig in general accordance with API-620 2006 edition.

The successful bidder will design, provide materials, and construct on-site the tank and associated appurtenances including foundation anchors, access stairs, top platforms, and maintenance lifting gear.

The successful bidder shall be responsible for testing the tank and the insulation space for leak-free condition. The successful bidder shall also provide technical personnel to supervise the initial cool-down of the tank with LNG provided by FNG. The initial cool-down is a critical step to ensure that metal shrinkage is properly controlled and the tank maintains integrity.

The successful bidder shall warranty materials and workmanship for a period of two years from the date of substantial completion. The successful bidder shall also warranty the tank rate of evaporation (“Heat Leak”) at a rate mutually agreed to in the contract for a period of two years. Bidders were requested to provide a design with a rate of evaporation that approaches 0.05% at 50% tank capacity at the Fairbanks annual mean temperature of 27°F.

Site Development

Land clearing, access roads, and secondary containment dikes are required for the site. The work will be designed under the guidance of FNG’s Owner Engineer. The work was included in the Tank bid.

Foundation

CHI Engineering in collaboration with Alaska-based engineering firms has completed geotechnical evaluations and studies necessary to establish a baseline for designing for permafrost conditions. The tank contractor will be responsible the final foundation engineering and construction.

Vaporization

FNG’s Owners Engineer will design the vaporization equipment. The equipment will be purchased by FNG and installed by Alaskan contractors or added to the tank contractors scope of work.



LARGE STORAGE TANK PROJECT

Truck offloading

FNG's Owners Engineer will design improvements to truck-offloading to allow higher transfer rates and more frequent deliveries. Equipment will be purchased by FNG and installed by Alaska contractors or added to the tank contractors scope of work.

Send-out pumps

FNG's Owners Engineer has developed specifications for in-tank LNG send-out pumps. The pumps will be purchased by FNG and installed by Alaska contractors or the Tank contractor under factory supervision. The in-tank pumps are selected for reliability and reduced operating cost. External booster pumps can be added in the future if high-pressure delivery to future industrial users is required.

CONTRACTS

The contracting plan for development of the complete new storage site, including the tank is based on FNG serving as the project developer, and issuing and coordinating multiple prime contracts. In this manner, FNG can select the best value providers for portions of the scope. The contracts are:

- Owner's Engineer – Currently CHI Engineering Services, Inc. Portsmouth, NH.
 - The Owner's Engineer is responsible for overall site development plans, including the vapor dispersion and thermal radiation studies, foundation design, equipment sizing
- Permitting Consultant – Not Yet Selected
 - Permitting consultant responsible to identify and make application for all required permits
- Structural Engineer / Arctic Engineer – Great Northern Engineering, Inc. Palmer, AK
 - The structural and arctic engineer provides the tank foundation support calculations, pile sizing, and cold weather details in support of work by Owner's Engineer.
- Geotechnical Engineer – Golder Associates, Anchorage, AK
 - Geotechnical engineer provides subsurface investigation and determines soil bearing capacity for foundations and structures placed on the site
- Tank Designer / Erector – Under Consideration
 - Tank designer / erector has responsibility for designing a tank and foundation of the specified size in compliance with all applicable codes, and Owner specifications, erecting the tank in a safe, timely manner, and testing and certifying the tank to applicable Codes and standards. Tank erector shall provide personnel to supervise the initial cooldown and commissioning of the LNG tank. Foundation scope will include supply, fabrication, and installation of foundation; installing cooling coils around foundation in accordance with final design, placement of embedded tank anchors; and completion of the tank foundation in a safe and timely manner. The Tank supplier will also be responsible to



LARGE STORAGE TANK PROJECT

prepare, rough grade, and fine grade site in accordance with plans prepared by Owner’s Engineer. This work includes preparation of the tank foundation site; construction of temporary access roads; grading and site prep for truck offloading facilities

- Mechanical Contractor – Not yet selected.
 - Mechanical contractor is responsible for setting all equipment other than LNG tank; installation of piping and supports in accordance with designs by Owner’s Engineer from first flange at tank to tie-in to existing distribution header; coordination of shutdowns for tie-ins; testing and commissioning of all piping and equipment. Mechanical contractor shall provide personnel to assist Owner in functional checkout and commissioning of all equipment. FNG may increase the scope of the Tank contractor to include the balance of plant should this prove to be a more economical solution.
- Electrical Contractor – Not yet selected.
 - Electrical contractor is responsible for providing and installing all temporary and permanent electrical service to the site in accordance with designs provided by Owner’s Engineer. Electrical contractor will provide conduit, supports, wiring and terminations to all equipment and devices requiring electrical or signal power or communications. Electrical contractor shall provide personnel to assist Owner in functional checkout and commissioning of all components.
- Other – Owner shall contract for other miscellaneous services including IT interconnecting and support; fencing, site security, security cameras and other services.

SCHEDULE

The schedule for project development is based on the following milestones

Milestones

June 15, 2017	Begin Preparing Updated RFP
September 15, 2017	Issue RFP for Tank Design & Erection
October 31, 2017	Tank proposals received
December 7, 2017	Final Investment Decision
December 18, 2017	Tank contract awarded
December 26, 2017	Final Foundation Design issued
December 18, 2017	Begin Civil Works
March 01, 2018	Begin Foundation Construction
June 18, 2018	Foundation complete and ready for tank erection
June 19, 2018	Commence tank erection
June 29, 2019	Tank ready for cool-down and commissioning



LARGE STORAGE TANK PROJECT

July 09, 2019	Begin Cool down
September 24, 2019	Cut over to new tank – send out begins

Budget

The total project budget is \$48.7 MM. FNG has previously expended \$1.7 MM in preliminary development work. The AIDEA Board of directors has authorized the expenditure of up to \$1.5 MM on additional Engineering work necessary to finalize the project, and FNG is requesting AIDEA approval to modify its existing SET's loan to allow for an additional \$45.5 MM in funding to complete construction.