



# INTERIOR ENERGY PROJECT

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LNG Trucking Roundtable  
November 15, 2013

# AGENDA

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- **Introductions**
- **Roundtable Goals**
- **IEP Project Overview and Goals**
- **Milestones**
- **LNG Basics**
- **Feasibility Analysis**
- **Transportation Logistics**
- **Feedback/Questions**

# ROUNDTABLE GOALS

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- **Provide project information to the trucking industry**
- **Understand operation challenges**
- **Reduce LNG transportation cost from the North Slope to Interior AK**

# WHO ARE AIDEA/AEA



- **A public corporation created in 1967 by the State of Alaska to promote, develop, and advance the general welfare of all the people of the state. AIDEA is authorized to provide financing in conjunction with the private sector for project planning and execution.**

- **A public corporation of the state created in 1976 with the mission to construct, acquire, finance, and operate power projects and facilities that utilize Alaska's natural gas resources to produce electricity and heat. AEA coordinates energy development and oversight in conjunction with AIDEA.**

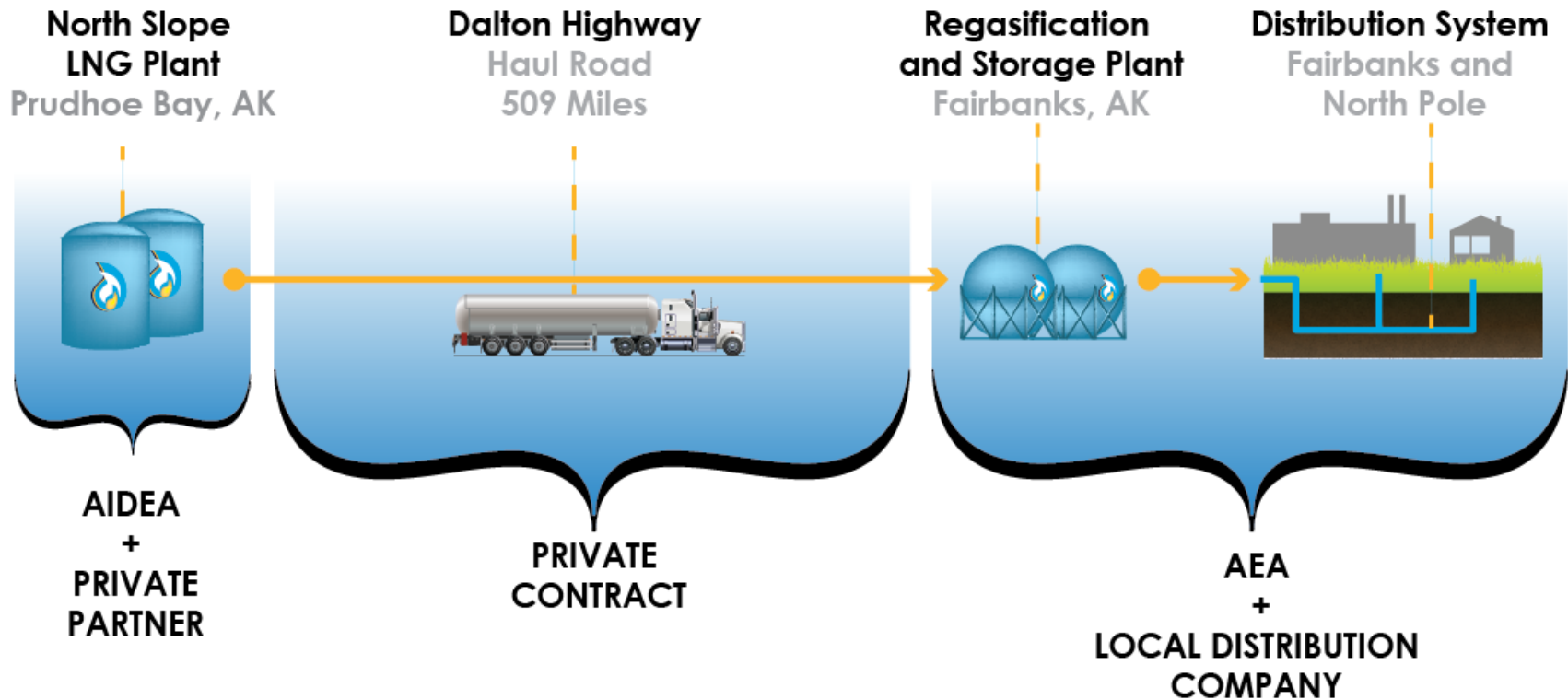


# IEP GOALS

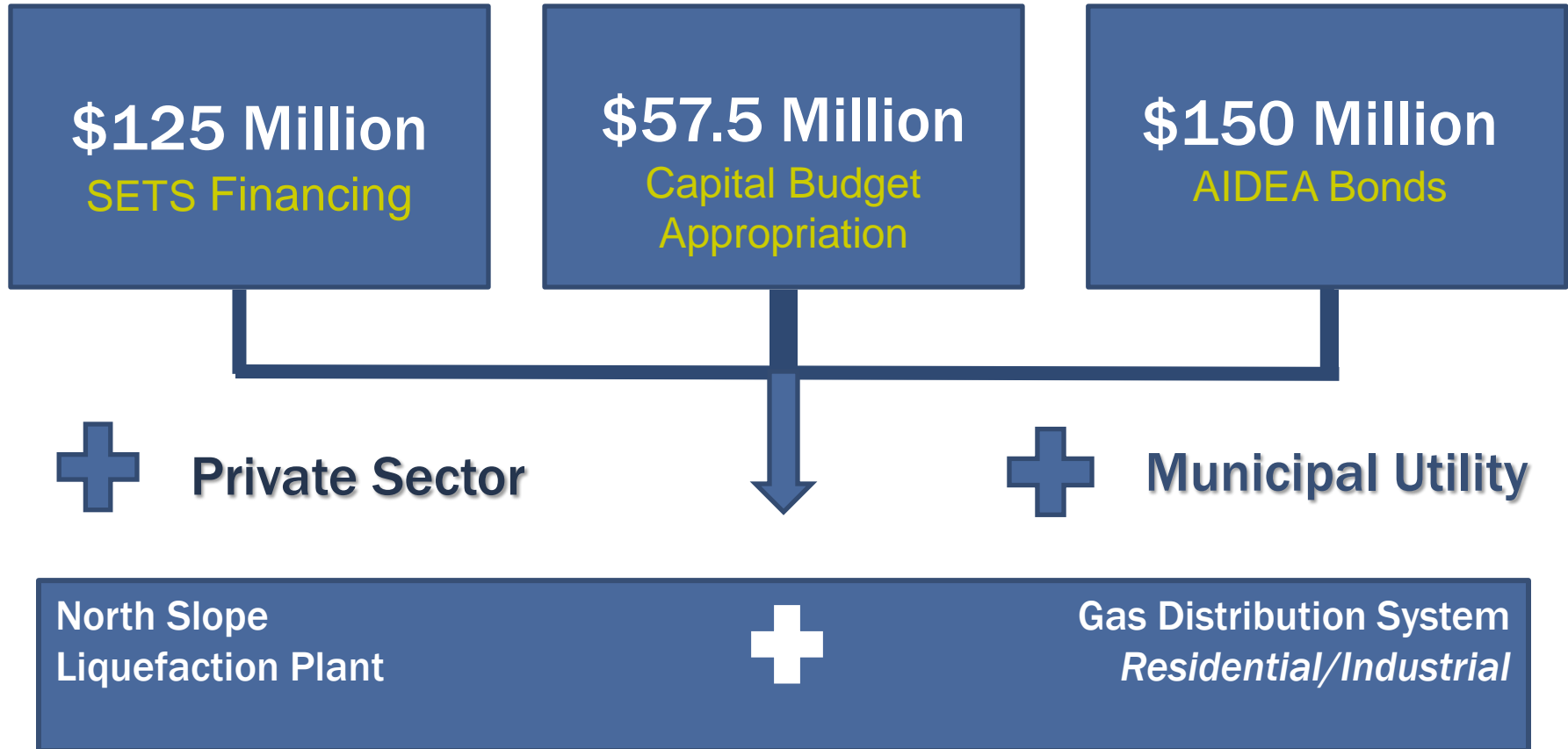
- **Provide affordable and reliable energy to as many Interior Alaska customers as soon as possible at as low of cost as possible**
- **After providing the Interior with natural gas, assure long-term access to natural gas and propane for all Alaskans**
- **IEP investments compliment alternative sources of gas supply**
- **Use private-sector mechanisms as much as possible**



# PROJECT OVERVIEW



# SB23 FINANCE PACKAGE



# LNG SALE PRIORITIES

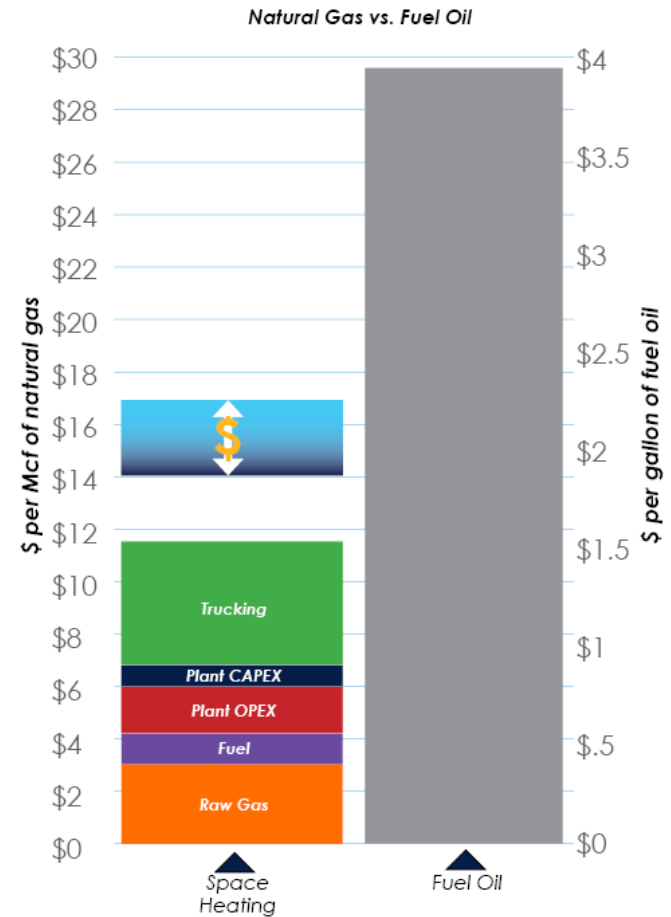
1. **FNSB Local Distribution Utilities (space heating)**
2. **Interior Electric Utilities**
3. **Interior industrial customers**
4. **Other regulated utilities**
5. **Open market LNG sales**





# COST AND TRANSPARENCY

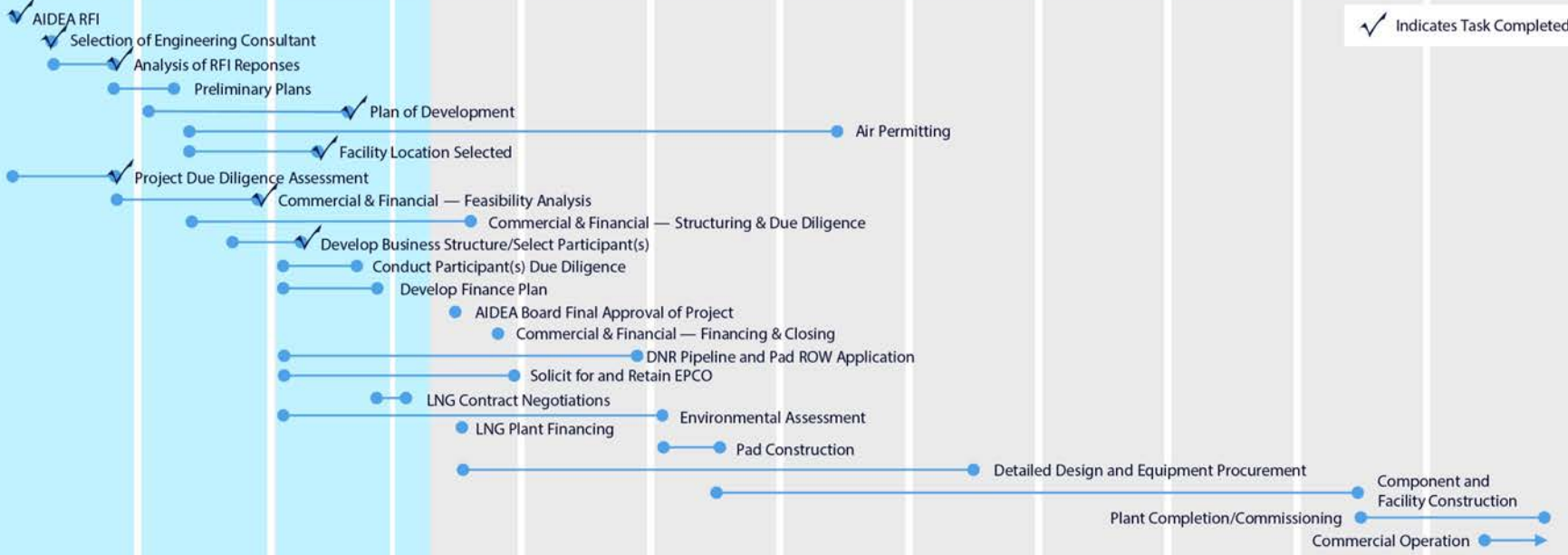
- **\$14.59 - \$17.09 per Mcf delivered to FNSB customers**
  - \$11.59 (production and transportation) +
  - \$3.00 - \$5.50 per Mcf (storage, regas and distribution)
- **Projected household savings**
  - \$2,500-\$3,000 each year



# AIDEA Interior Energy Project - Schedule



## LNG Facility



## Local Distribution Company



# WHAT IS LNG?

# PHYSICAL PROPERTIES OF LNG

- **LNG = Liquefied Natural Gas**
- **Clear, colorless, odorless liquid**
- **Natural gas refrigerated until it becomes a liquid at -260 degrees F**
- **Primarily methane with trace nitrogen and other hydrocarbons**
- **3.6 to 3.8 pounds/gallon of LNG**
- **1 cubic foot of LNG = 600 cubic feet of gas**

# LNG SAFETY & HANDLING

- ④ **LNG is not flammable**
- ④ **Vapor from LNG is flammable**
  - **Ignition & burning requires vaporization and mixture with O<sub>2</sub>**
  - **Burning is not sustainable outside the flammability limits (5% to 15% methane)**
  - **Burns as a “lazy flame” (candle)**
- ④ **Autoignition temperature of methane is 1,004<sup>0</sup>F; significantly higher than gasoline (495<sup>0</sup>F) and diesel (600<sup>0</sup>F)**

# LNG SAFETY & HANDLING

- **LNG rapidly vaporizes under atmospheric conditions**
- **Rapid phase change can create vapor clouds (condensation of atmospheric moisture)**
- **Lighter than air above -160 F**
- **Cryogenic liquid requires proper PPE and equipment**

# LNG TRANSPORT TRAILERS

## ● Double-walled design

- Interior tank typically stainless steel or aluminum
- Outer tank is carbon or stainless steel
- Void space filled with insulation material and under vacuum

## ● Low pressure

- Normal operating pressure is less than 70 PSIG with redundant pressure safety valves

## ● Comply with 49 CFR 173.318 and 178.338 (MC-338)

# LNG TRANSPORT TRAILERS

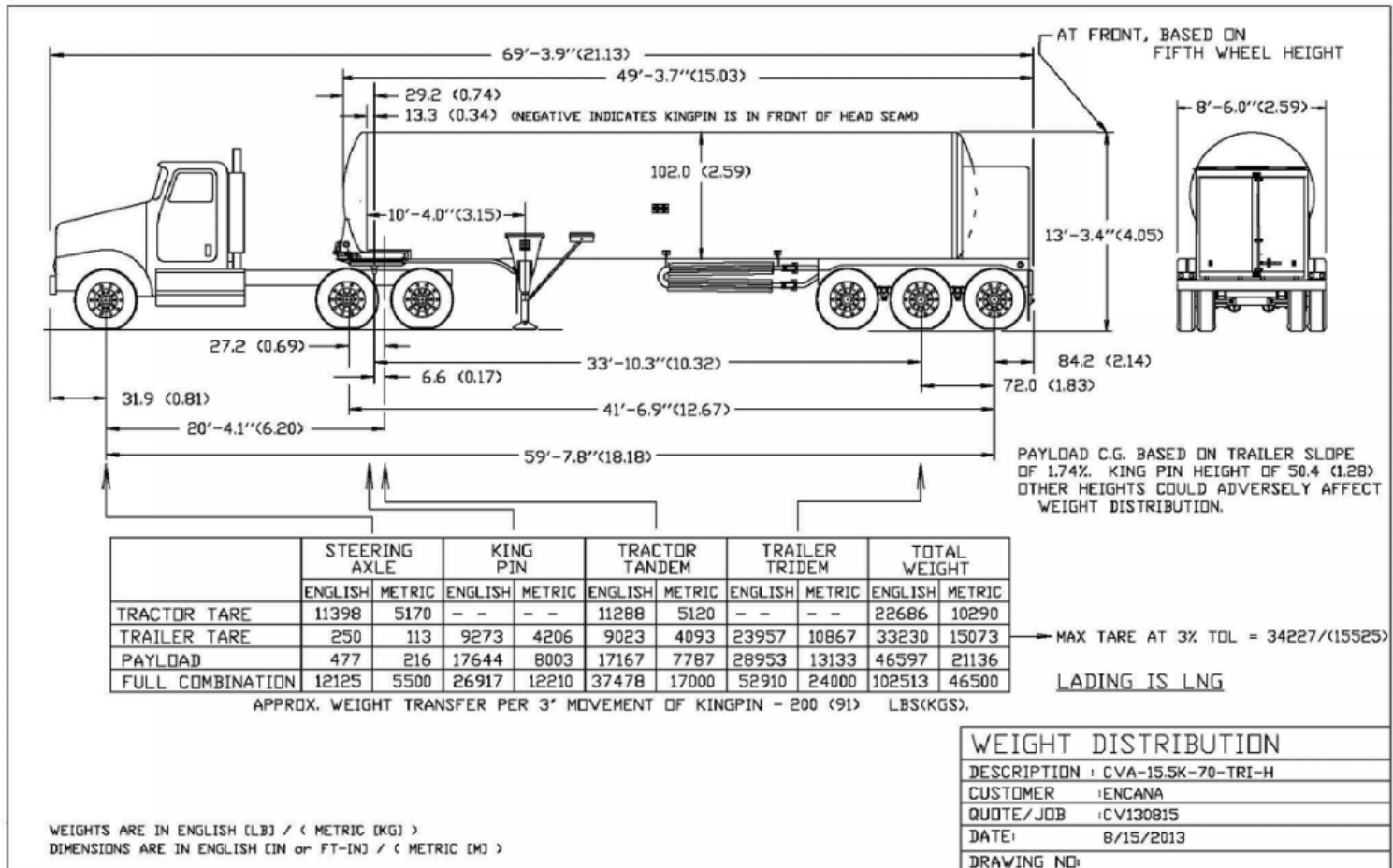
- ④ **Existing trailer capacity**
  - 10,500 to 19,000+ gallons (water capacity)
- ④ **Multiple trailer manufactures available**
  - CVA
  - Chart Industries
  - Westmor
  - Others
- ④ **Procurement lead-times range from 6-12 months**



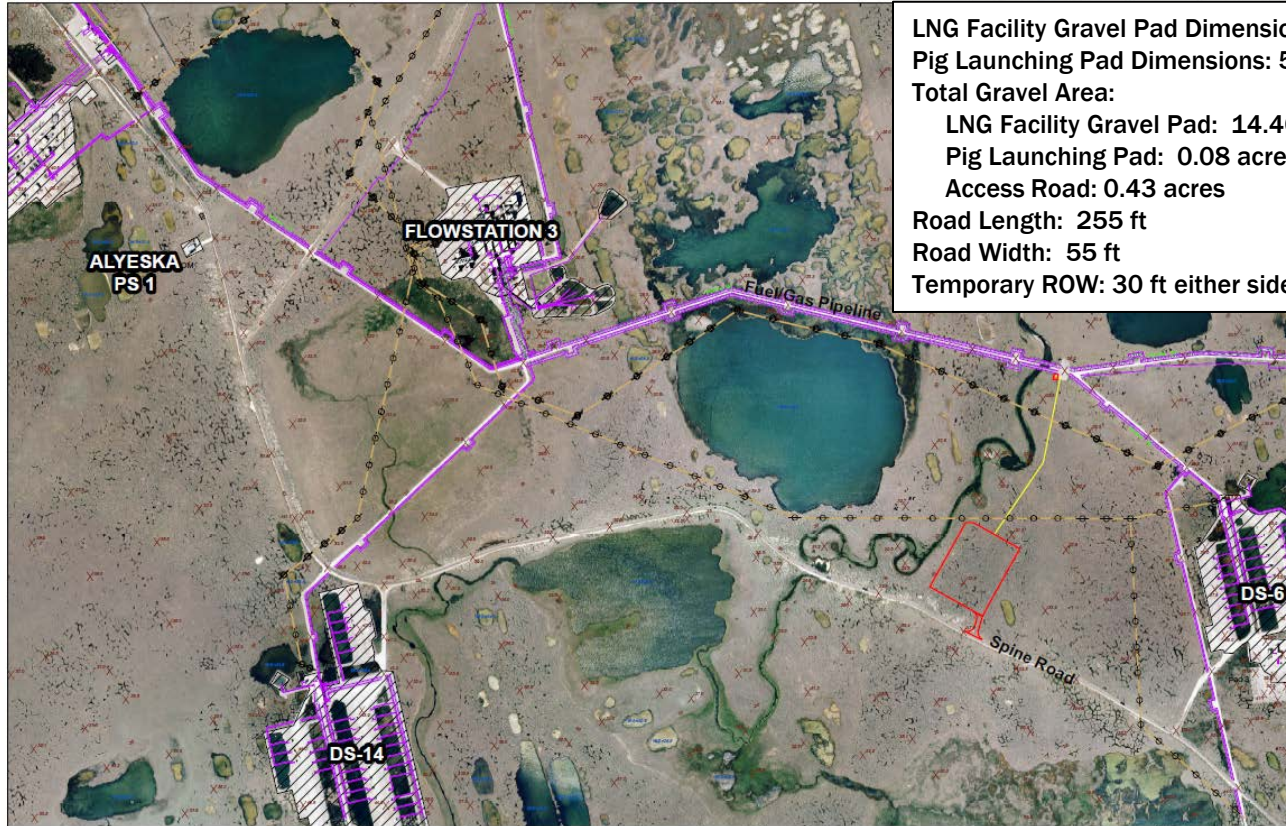
# LNG TRANSPORT TRAILERS



# LNG TRANSPORT TRAILERS



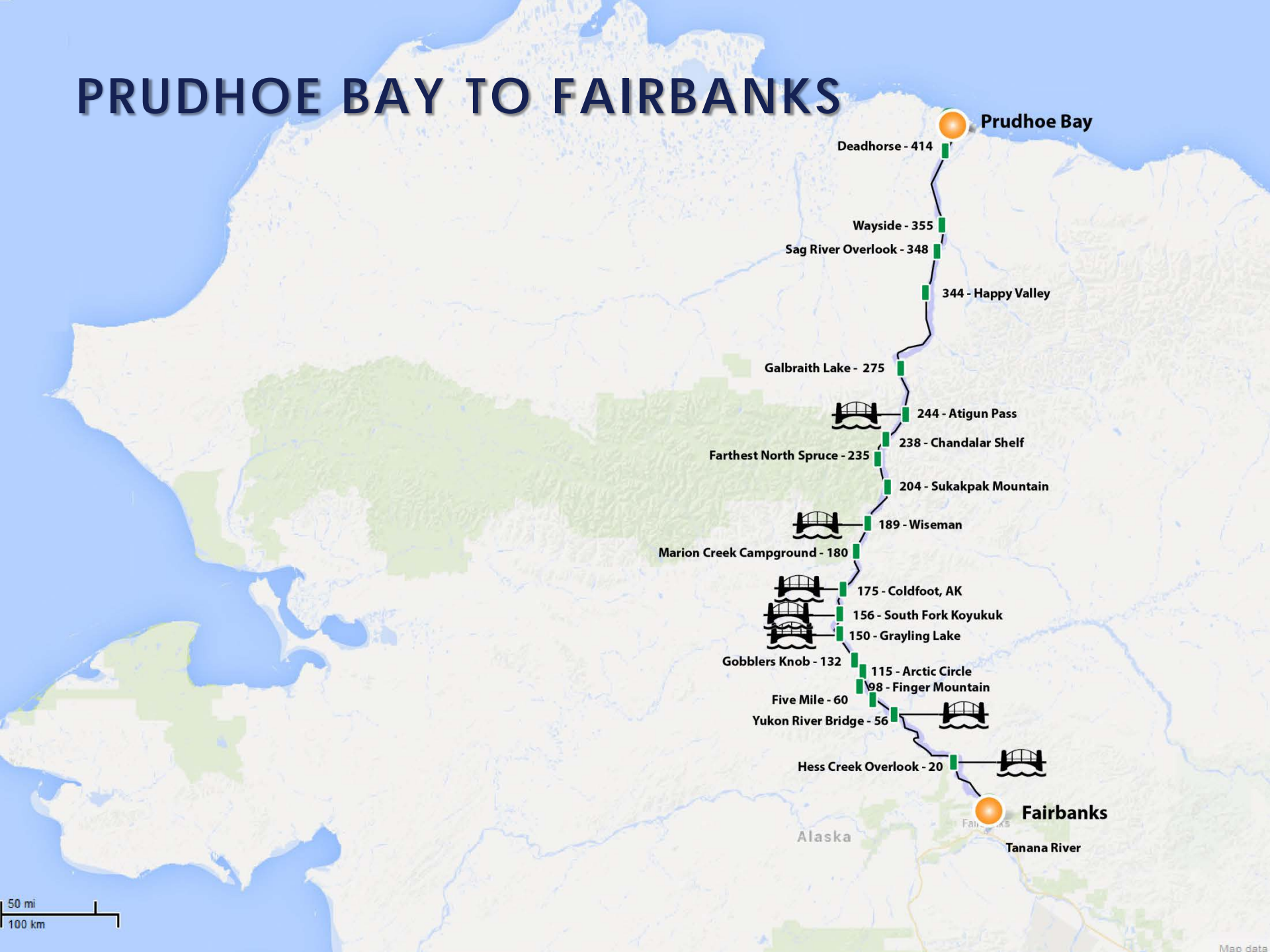
# LNG FACILITY LOCATION



**LNG Facility Gravel Pad Dimensions: 700 ft x 900 ft**  
**Pig Launching Pad Dimensions: 50 ft x 70 ft**  
**Total Gravel Area:**  
 LNG Facility Gravel Pad: 14.46 acres  
 Pig Launching Pad: 0.08 acres  
 Access Road: 0.43 acres  
 Road Length: 255 ft  
 Road Width: 55 ft  
 Temporary ROW: 30 ft either side of pads and roads



# PRUDHOE BAY TO FAIRBANKS



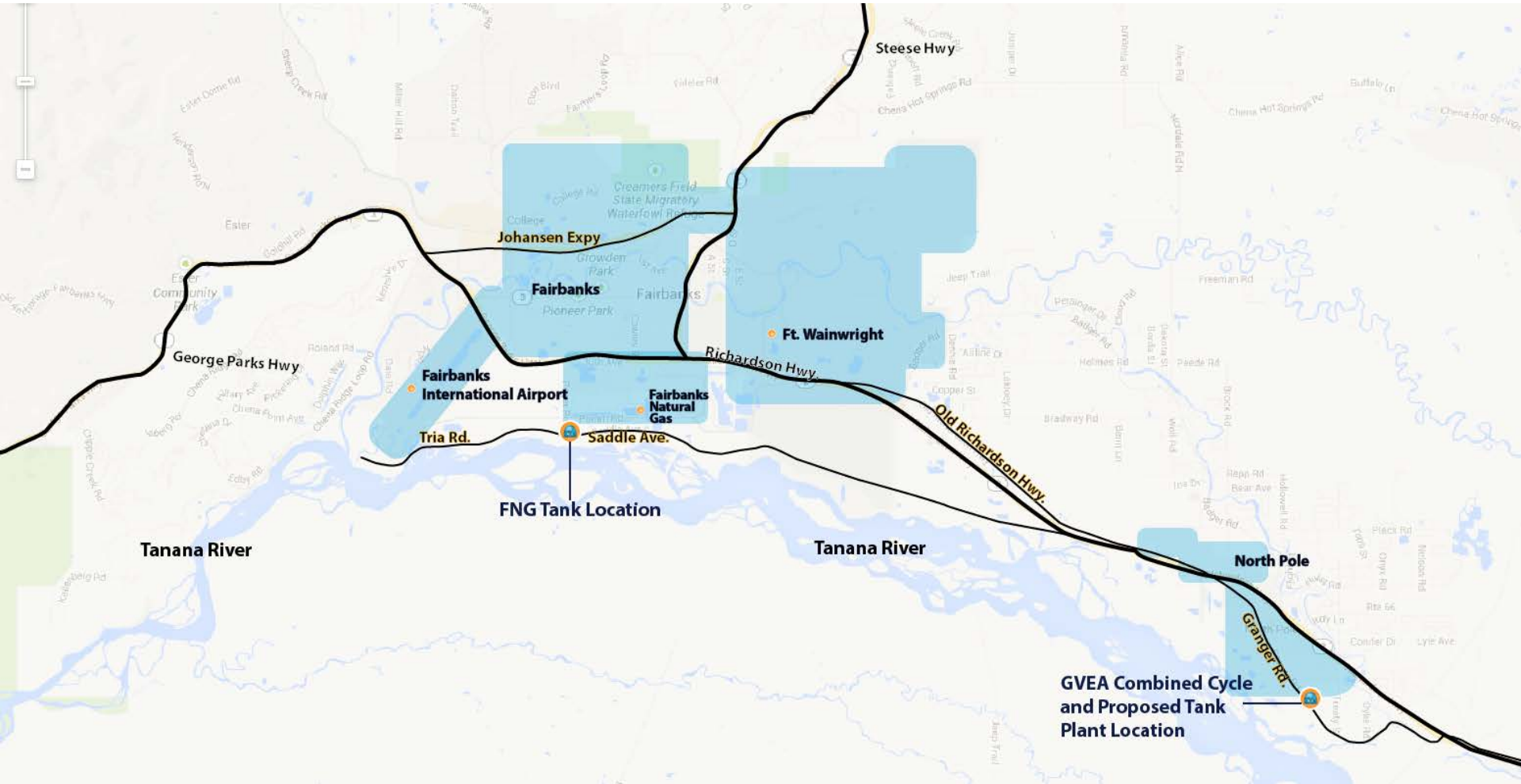
50 mi  
100 km

Alaska

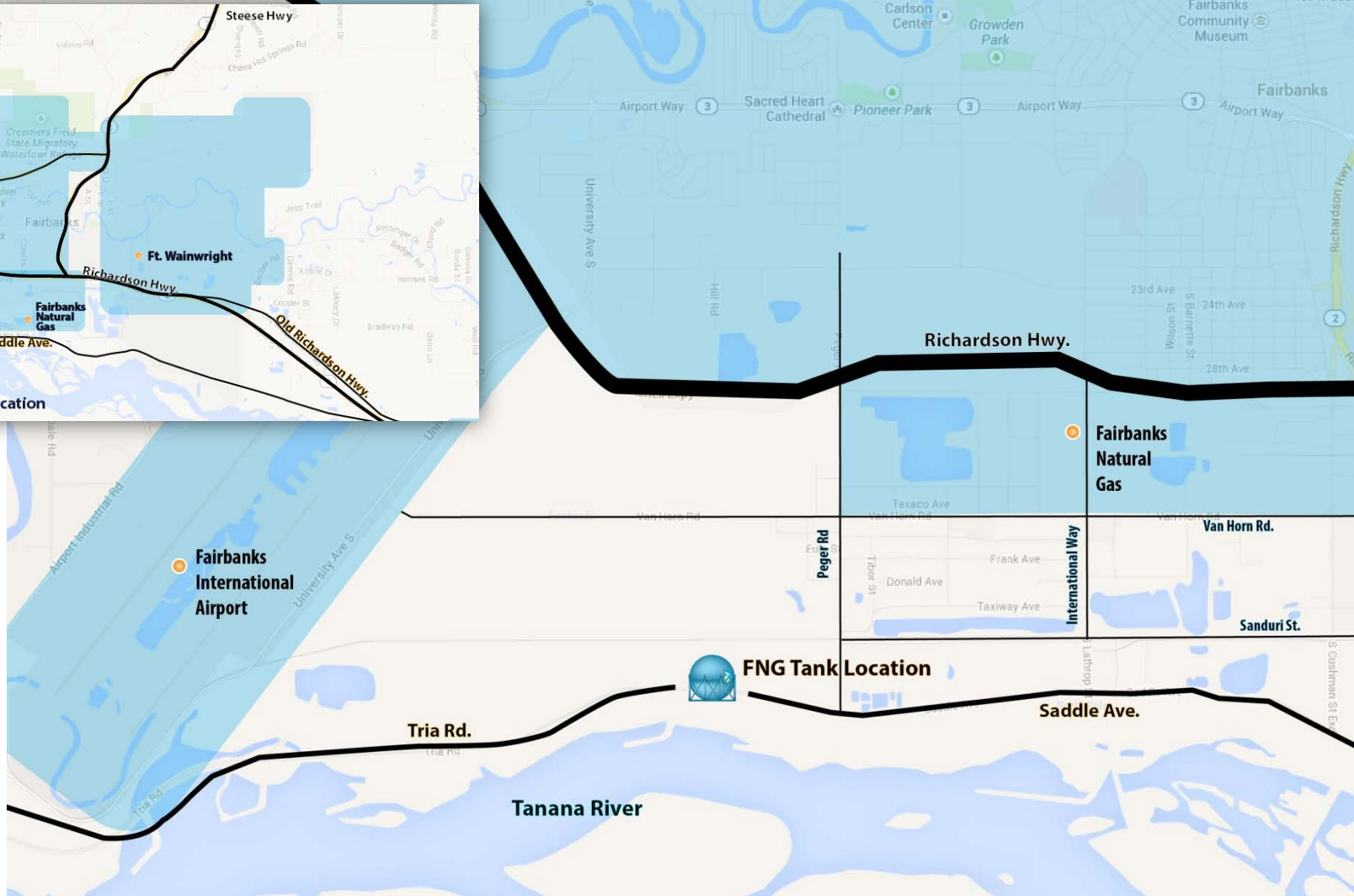
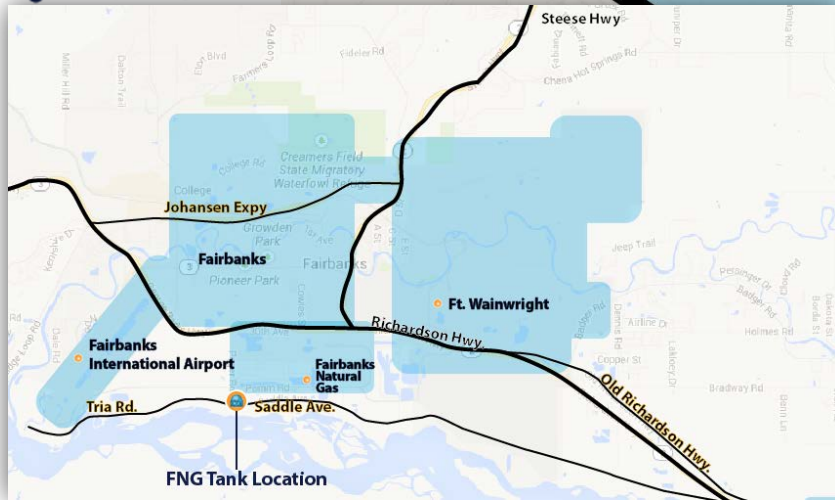
Fairbanks

Tanana River

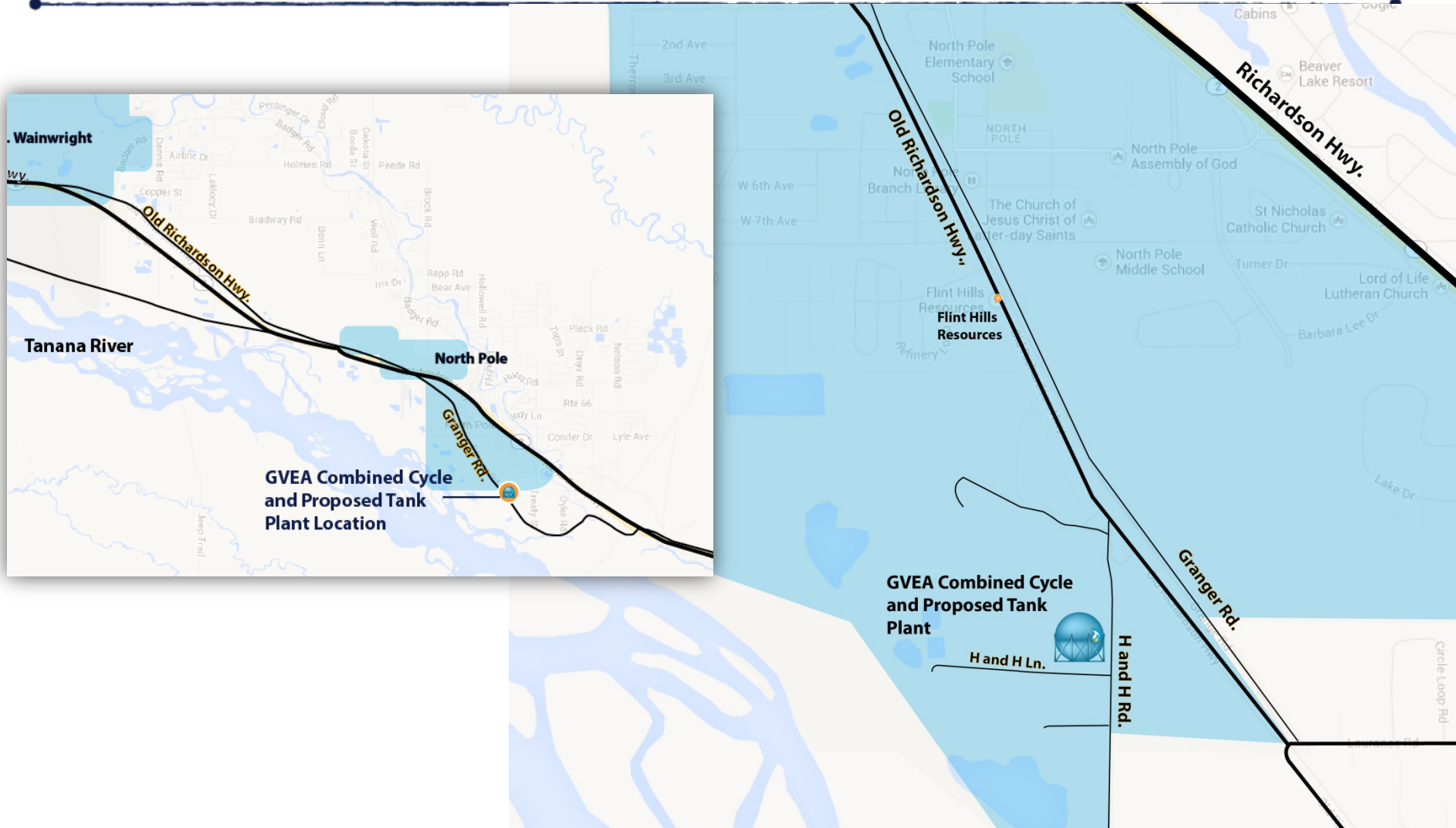
# PROPOSED LOCATIONS



# PROPOSED LOCATION FAIRBANKS



# PROPOSED LOCATION NORTH POLE



# FEASIBILITY ANALYSIS

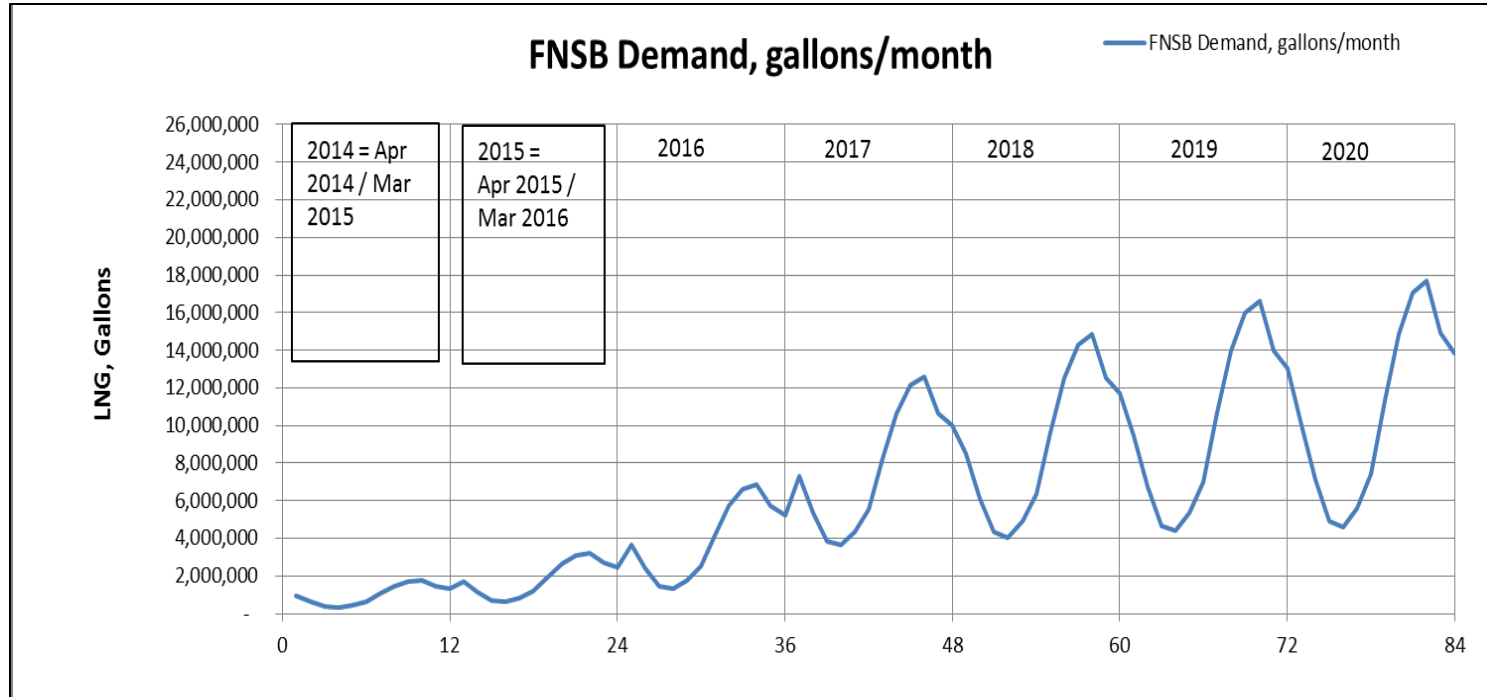
- **Preliminary transportation analysis completed by Prolog**
- **Initial feasibility conservatively based on 10,500 gallon trailers with LNG trucks**
- **Current LNG Engine Availability**
  - **Westport Conversions: Currently available**
  - **Cummins: 15L engine due in 2015**
  - **Diesel trucks add up \$1/Mcf to overall residential gas cost**



# TRANSPORTATION LOGISTICS

## Significant season swing in natural gas demand

- Winter 300,000 GPD → approximately 28 deliveries per day
- Summer 60,000 GPD → approximately 6 deliveries per day



# TRANSPORTATION LOGISTICS

- **Haul route disruptions**
- **Weight and length restrictions on primary routes**
- **Mid-Dalton Highway LNG refueling station (Coldfoot or Wiseman)**
- **Increased traffic both from IEP and oil industry projects**

# TRANSPORTATION LOGISTICS

- ④ **ADOT road maintenance and budget**
- ④ **Driver training**
- ④ **HSE plans**
  - **Haul route communications**
  - **Tractor-trailer tow capabilities**
  - **Mobile vaporization units**
- ④ **Propane transportation**



# FEEDBACK/ QUESTIONS

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