Alaska South Central LNG (SCLNG) Project

Overview for Alaska Legislators

May, 2013

Alaska SCLNG Project - Overview

- BP, ConocoPhillips, ExxonMobil and TransCanada are working together to progress an Alaska LNG project:
  - 300+ people developed concept, $35M spent thru Apr13
  - Key third party contractors engaged (URS, Fugro, exp)
  - Leveraging Denali, APP, related material ($700M past work)

- Concept work has defined key issues:
  - Integrated Basis of Design heat/material balance complete
  - Potential integration into existing operations
  - Required gas treating plant design (North Slope location)
  - Pipeline size and routing options (800+ miles, 42” x80 pipe)
  - LNG plant design (15-18 million tons per annum – “MTA”)
  - Gas off-take capacity for secure Alaska fuel supply
  - Preliminary capital estimate - $45-65 Billion (2011 dollars)

- Key project issues to address:
  - “Mega-project” challenges (labor, resources, equipment, etc)
  - Commercial and fiscal issues
  - Uncertainty related to permitting timing

- Forward Plans:
  - Planning the 2013 Summer Field Season
  - Use “Phased/Gated” process to advance project
  - Continue working together to optimize design

Alaska SCLNG Plant
Conceptual Layout

Results of
URS ArcGIS
Location Suitability
Screening Study

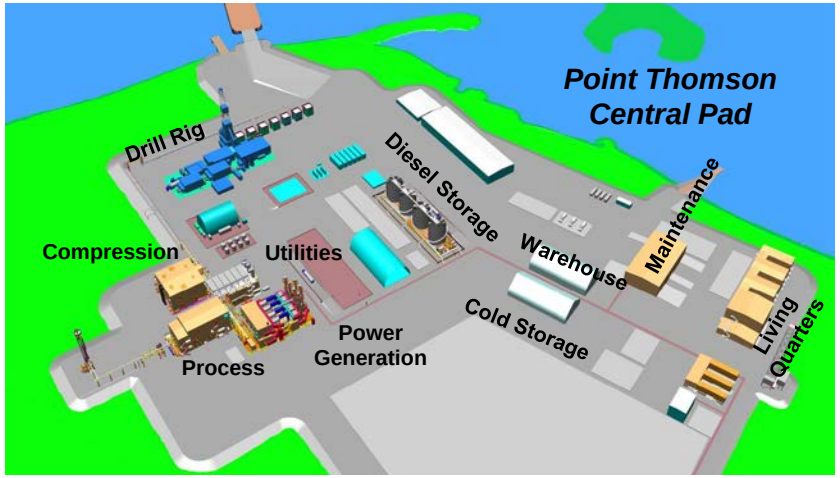
Work Product In Progress

SCLNG Concept Summary - Upstream

PTU (62 miles east of PBU/GTP area)

- Initial Production System (IPS) project in progress - 2016 SU
- Preliminary SCLNG design basis for PTU:
  - Leverage IPS facilities, add fourteen new wells
  - Add new gas facilities to existing central pad / facilities
  - New 30” gas line from PTU to GTP in Prudhoe Bay
  - Peak workforce – 500-1,500 people

PTU Field Layout



PBU Tie-in (adjacent to proposed GTP location)

- Installation / tie-in managed by Prudhoe Bay Operator
  - Tie into existing CGF, deliver gas to new Gas Treatment Plant
  - Gas project / deliveries tied to future PBU operations

- Preliminary plan is to inject CO_2 using existing injection systems as appropriate

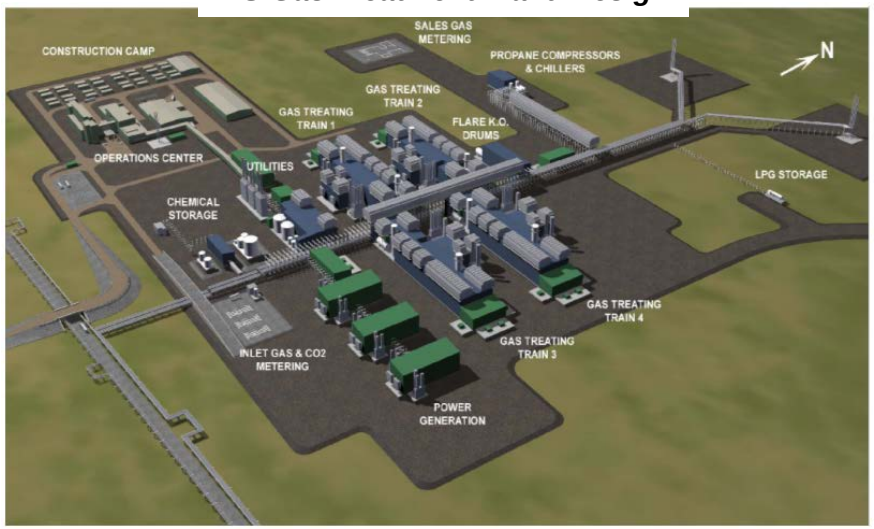
PBU Central Gas Facility Tie-in

SCLNG - Concept Summary - Midstream

NS Gas Treatment Plant

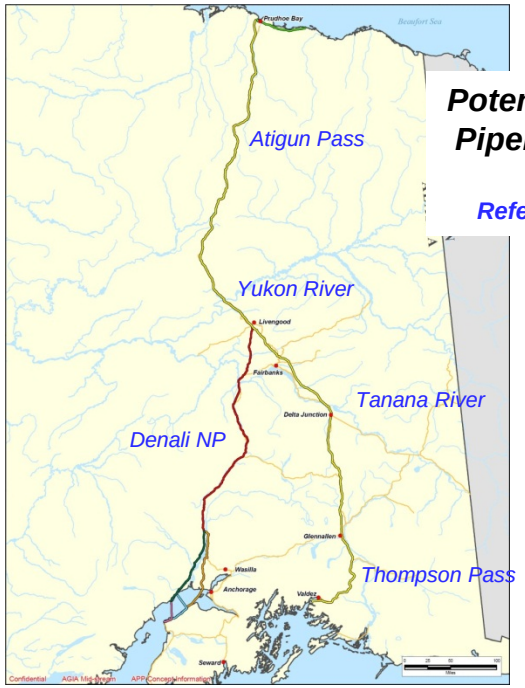
- Designed to remove gas impurities
- Four amine trains with compression, dehydration and chilling
- Prime power generation (5 units, 54kHP)
- All required utilities, infrastructure and camps
- Facility will be modularized, sealifted to location
- Peak workforce – 500-2,000 people

NS Gas Treatment Plant Design



Gas Pipeline and Compression Stations

- 800+ mile 42” x80 pipeline
- 3-3.5 billion cubic feet gas per day
- Eight compressor stations (30kHP each)
- Pipeline contents will be treated gas, impurities removed
- Designed to manage continuous and discontinuous permafrost regions
- Expansion potential with additional compression if appropriate
- Five off-take points for Alaska gas delivery
- Peak workforce – 3,500 - 5,000 people



Potential SCLNG Pipeline Routes

Reference Points

Work Product In Progress

SCLNG - Concept Summary – Downstream

LNG Plant and Storage

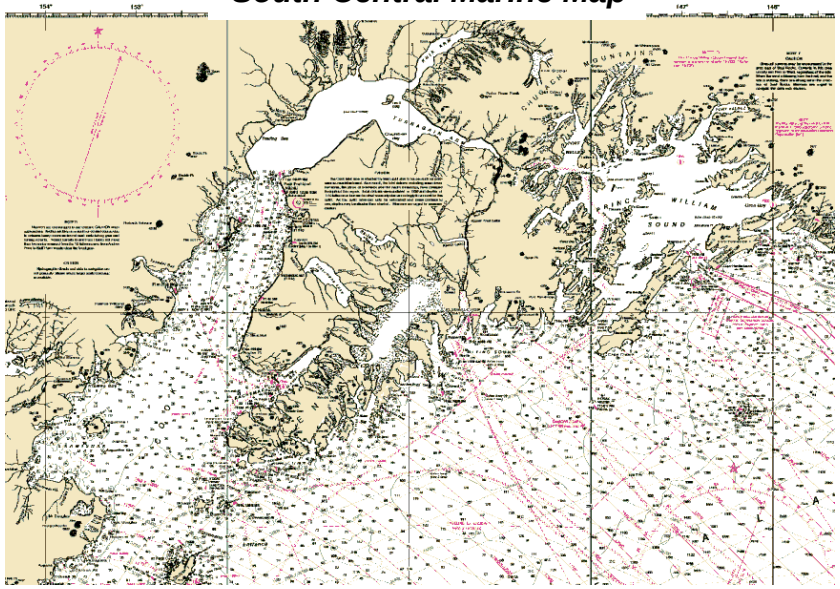
- Three 5.8 million tons per annum (MTA) LNG trains
  - Plant receives 2.2 - 2.5 billion cubic feet per day to liquefy
  - LNG production varies with ambient temp (4.9 - 6.3 MTA)
  - Small volume of stabilized condensate produced (~1,000 bbl/day)
- Integrated utility system with all utilities on site
- Two-three 160,000 cubic meter LNG storage tanks
- Peak workforce – 3,500 – 5,000 people

SCLNG Plant and Storage

Marine Offloading Facility

- Conventional jetty and trestle design
- Two berths
- Design based on 15-20 LNG carriers
- Marine support system includes required tugs, security boats
- Peak workforce – 1,000 – 1,500 people

South Central Marine Map



SCLNG – Safe 2013 SFS Program

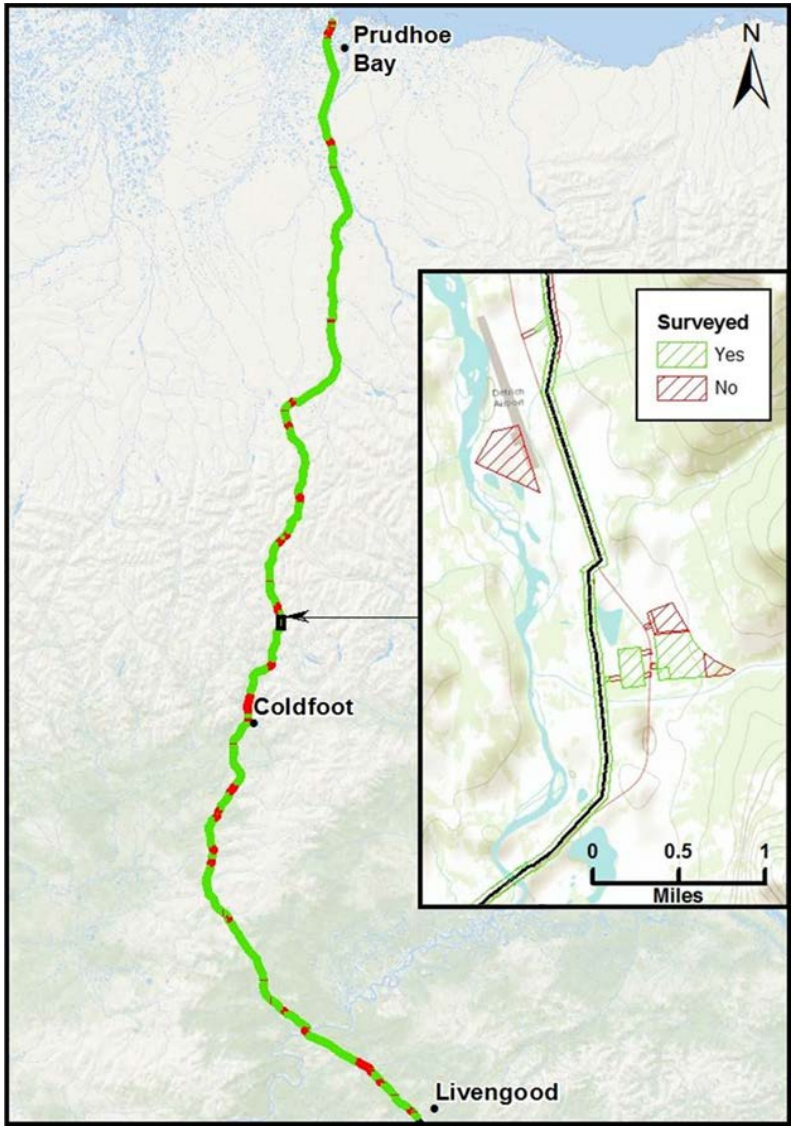
- Key plans and documents
  - Safety / training plan
  - Execution Plan
  - Regulatory Roadmap
  - Individual Agency Permit Plans
  - Field Data and Survey Protocols
  - Preliminary title research

- Pre-Field work
  - Safety training and stewardship
  - Land access permitting
  - Logistics and transportation
  - Contracting and controls
  - Data management and delivery

- Key challenges
  - Remote locations
  - Multiple field crews
  - Minimize impact
  - Summer season duration

SCLNG - 2013 Summer Field Season Scope

- Planning, logistics, and permitting to support survey work
- Public and agency engagement to support survey work and ongoing project planning
- 2013 Summer Field Season work:
  - Cultural Resources: > 6,500 acres
  - Hydrology: 37 field targets
  - Lakes: 17 field targets
  - Fisheries: 20 field targets
  - Traditional knowledge, subsistence, and ethnographic surveys



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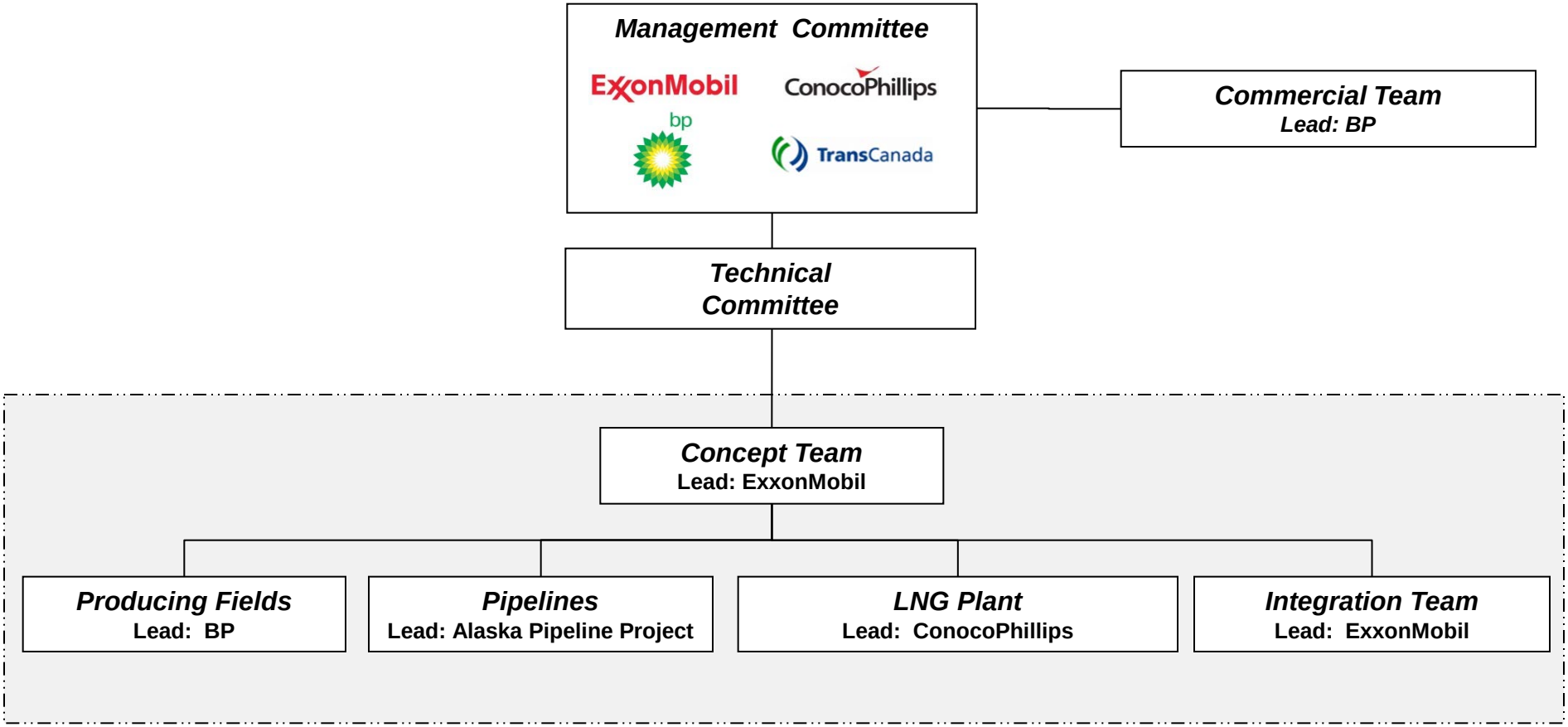
Back-Up Material

Attachments to Oct-12 Letter to Governor Parnell

May, 2013

Attachment 1

Southcentral Alaska LNG – Integrated Team



Multimillion Dollar, Four-Company Effort – 125+ Employees, 100+ Contractors

- **Joint work commenced March 31, 2012 after completion of the Pt. Thomson Settlement / joint work agreements**
- **Cooperative effort among the leading North Slope producers and a leading North American pipeline company**
- **Identified potentially viable LNG project options to monetize ANS natural gas**
- **Used company strengths, shared information / expertise; built upon past efforts, sought out new ideas**

Attachment 2

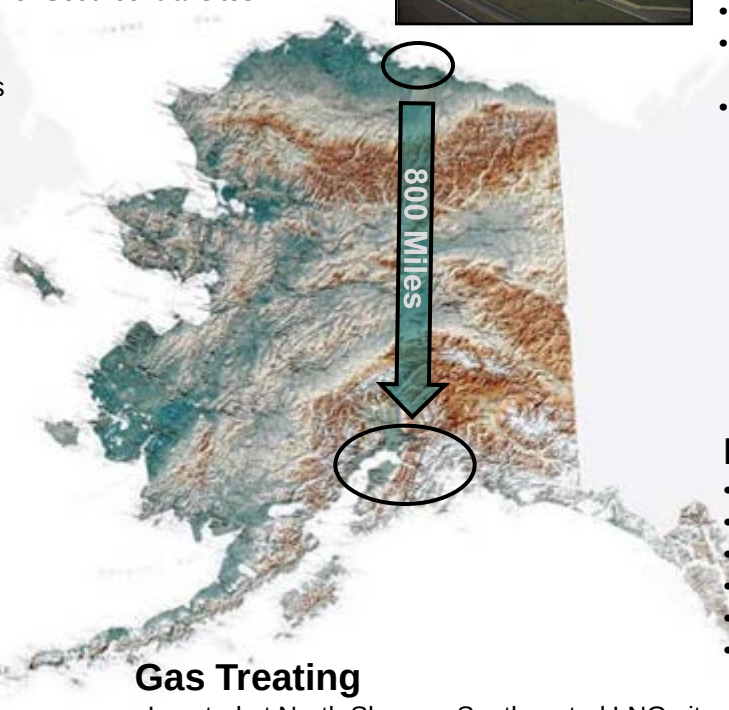
Alaska Southcentral LNG – Project Concept Description

Liquefaction Plant

- Capacity: 15 – 18 million tonnes per annum (MTA)
  3 trains (5-6 MTA / train)
- Potential areas: 22 sites assessed in Cook Inlet, Prince William Sound and other Southcentral sites
- Footprint: 400 - 500 acres
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 100,000-150,000 tons

Producing Fields

- ~35 TCF discovered North Slope resource
- Additional exploration potential
- Anchored by Prudhoe Bay and Pt. Thomson with ~20 years supply available
- Use of existing and new North Slope facilities
- Confirmed range of gas blends from PBU/PTU can generate marketable LNG product
- Peak Workforce: 500 – 1,500 people

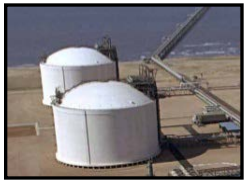


Pipeline

- Large diameter: 42”- 48” operating at >2,000 psi
- Capacity: 3 - 3.5 billion cubic feet per day
- Length: ~800 miles (similar to TAPS)
- Peak Workforce: 3,500 - 5,000 people
- Required Steel: 600,000 - 1,200,000 tons
- State off-take: ~5 points, 300-350 million cubic feet per day, based on demand

Storage / Loading

- LNG Storage Tanks, Terminal
- Dock; 1 - 2 Jetties
- Design based on 15– 20 tankers
- Peak Workforce: 1,000-1,500 people



Gas Treating

- Located at North Slope or Southcentral LNG site
- Remove CO_2 and other gases and dispose / use
- Footprint: 150 - 250 acres
- Peak Workforce: 500 - 2,000 people
- Required Steel: 250,000 - 300,000 tons
- Among largest in world

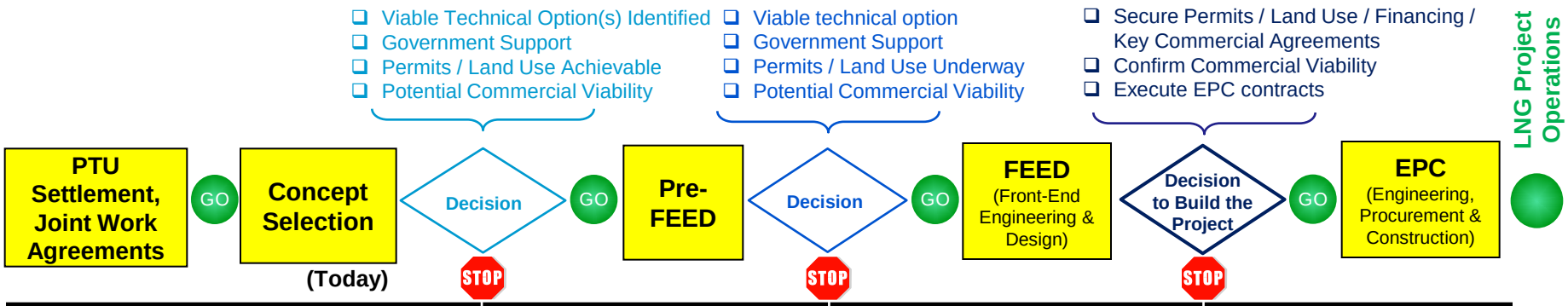
Estimated Total Cost: $45 – $65+ Billion **Peak Construction Workforce: 9,000 – 15,000 jobs**
Operations Workforce: ~1000 jobs in Alaska

Descriptions and costs are preliminary in nature and subject to change. Cost range excludes inflation.

Attachment 3

Southcentral Alaska LNG – Work Plans / Key Decision Points

Requirements to Take Next Step:



Peak Staffing:	~200	400 - 500	500 – 1,500	9,000 – 15,000
Cost ($):	Tens of Millions	Hundreds of Millions	Billions	Tens of Billions
Est. Engineering / Technical Duration*:		*12 - 18 Months*	*2 - 3 Years*	*5 - 6 Years*

Activities

Evaluate: • Range of technically viable options for major project components • Business Structure • In-state gas / export LNG demand	**Progress**: • Preliminary engineering to refine concept • Business structure • Financing plan	**Complete**: • Front-end engineering & design • Major contract preparation • Business structure • Financing arrangements	**Execute**: • Final engineering • Financing • Procurement • Fabricate / Logistics / Construct • Prepare for Operations
Solicit Interest of Others		**Solicit Interest of Others**	
Establish Government Support and Advance Regulatory Issues: • Competitive oil tax environment; predictable / durable LNG project fiscal terms; AGIA Issues • Assure ability to secure regulatory approvals / permits / land use • Environmental activities / Technical data collection • Stakeholder engagement • File DOE Export License		**Advance Gov't / Reg. Issues:** • Key permit / land use approvals • Stakeholder engagement • Secure DOE Export License	**Complete Gov't / Reg. Issues:** • Secure remaining construction / operating permits • Stakeholder engagement
	Start individual gas / LNG sales / shipping efforts	**Execute individual gas / LNG sales / shipping agreements**	**Implement business structure & agreements**
Screen commercial viability	**Assess commercial viability**	**Confirm commercial viability**	**Commission / start-up**

*** NOTE: Duration of various phases may be extended by protracted resolution of fiscal terms, permitting and regulatory delays, legal challenges, changes in commodity market outlook, time to secure long-term LNG contracts, labor shortages, material & equipment availability, weather, etc.**