

ALASKA IN-STATE GAS PIPELINE PROJECT



PRESENTATION TO THE COMMERCIAL WORKING GROUP
OCTOBER 28, 2009

This Meeting

- Summarize the work completed to date
- ENSTAR will review the work they have completed:
 - Pipeline cost estimate
 - Cost of transport
 - Gas storage
- Review Baker engineers work plan to refine the cost of transport estimate
- Review the status of the ROW permitting

Purpose of the State's effort

- To determine if there is an economically viable pipeline project transporting gas from the North Slope to Tidewater at Cook Inlet
- Attempt to reduce the risk of this project to a future pipeline developer

End Point for the State

- Development of a package that could be sold to a pipeline development company
- Engineering study laying out the cost of service for different cases
- Set of permits:
 - Federal ROW
 - State Row
 - Corps of Engineers 404 permit
- Hopefully, Letters of Intent
 - Buyers
 - Sellers

Turn-over of the Package

- State would sell the “package”
- Pipeline company would then be responsible for:
 - Open Season (if one is needed)
 - Completing the design
 - Completing NTP process
 - Building the pipeline
 - Operations

Work Completed

- Route alternative analysis - Parks and Richardson Highway routes:
 - Associated cost estimates
- Identified major project issues:
 - Cost issues associated with each component
- Set compression station locations (for permitting)
- Project description (for permitting)
- Federal and State ROW and USACE 404 permit applications
- Permitting process set to start (November 2009)

Major Issues That Have Come From This Work

- Cost of gas conditioning on the North Slope
- Marketability of NGL's if sold at tidewater in Cook Inlet region

Schedule

- File major permit applications – November 2009
- Complete “cost of transport” estimates - early summer 2010
- Updated “cost of transport” estimates after field season, November 2010
- Complete initial permitting effort – February 2011
- Turn over State package to pipeline company – April 2011
- Project is on track for 2015-2016 start-up

Reference Case

- Prudhoe Bay gas supply (methane only)
- Gas conditioning on North Slope
- NGL extraction on North Slope
- 24" pipeline dry/wet compatible
- 2500 psi
- Park Highway route (South of Fairbanks)
- Connecting to existing Cook Inlet pipeline system at mp 39 of the Beluga pipeline

Alternatives To Be Considered

- Dry gas only pipeline
- Lower gas flow levels – 16" – 18" pipeline
- NGL extraction at Cook Inlet:
 - Using CGF residue gas
 - Stabilizer over head gas
- Gas conditioning at Cook Inlet
- Gas from Gubic*
- Gas from Point Thomson*

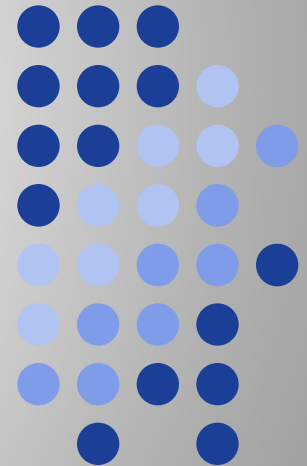
*Requires producer input

North Slope to Cook Inlet Bullet Pipeline

Cost Estimate Summary & Storage Overview

10/28/09

John Lau – ENSTAR Director of Engineering



Brief Overview of Project

Review of Pipeline Cost Estimate

Cost of Transport

Gas Storage in Cook Inlet

Brief Overview of Project



Pipeline – 738 miles

Product - Sales Quality Natural Gas

Gas Source – North Slope (Prudhoe Bay)

Diameter – 24 inch

Wall Thickness - 0.595 inch

Steel Grade - API 5LX70

MAOP - 2,500 psig

Flow – 500 mmscfd

Compressor Stations - 2 Intermediate Stations

Brief Overview of Project

Review of Pipeline Cost Estimate

Cost of Transport

Gas Storage in Cook Inlet

Review of Pipeline Cost Estimates

Estimate Methodology

- Crewed up concept (based on production and manpower and equipment)
- Project separated into 4 construction spreads
- Based on 3 years construction (2 summers, 3 winters)
- Two independent estimates (one by contractor, one by estimator)
- Field assessment for constructability of route
- Terrain analysis
- Up-to-date material quotations on permanent materials (pipe, valves, etc.)

Review of Pipeline Cost Estimates

Estimate Components

- Routing and Design
 - ▶ Several field routing trips with engineers and construction consultants
 - ▶ Fault characterization study
 - ▶ Aerial photography – LiDAR data and contour mapping entire route
 - ▶ Ray Krieg's terrain unit analysis
 - ▶ Coordination with ADOT for routing and including four aboveground river crossings
 - ▶ Significant HDD Crossings –Tanana/Nenana Rivers, Big Susitna River. For cost estimate, bridge was used for Yukon River.
 - ▶ Civil work – ROW, roads, access, material sites
 - ▶ Communications (both during and post construction)
 - ▶ Restoration costs
 - ▶ Stations (compressor stations, custody transfer metering, pressure regulator stations)

Review of Pipeline Cost Estimates

Estimate Components

- Materials
 - Civil Materials included gravel for camps, laydown areas, work pads, pipe padding, etc.
 - Fill/cut quantities estimated using topo data (4-ft contours) acquired for the project
 - Consumable construction supplies covered in 12% markup for small tools and miscellaneous
 - Vendor budget quotes (CIF) for all permanent materials (i.e. pipe, valves, fittings, etc.)
 - Steel costs used \$1,950/ton (current steel costs are lower)

Review of Pipeline Cost Estimates

Estimate Components

● Labor and Equipment

- ▶ 2008 labor rates based on standard labor agreements
- ▶ Based on a 12-hr x 7-day work week
- ▶ Liability & Compensation Insurance at 12% of labor costs
- ▶ Production rates based on terrain types/ditch modes
- ▶ Per Diem @ \$275 per camp man-day
- ▶ Equipment rental and operation rates based on 2008 Rental Rate Blue Book for Construction Equipment

Review of Pipeline Cost Estimates

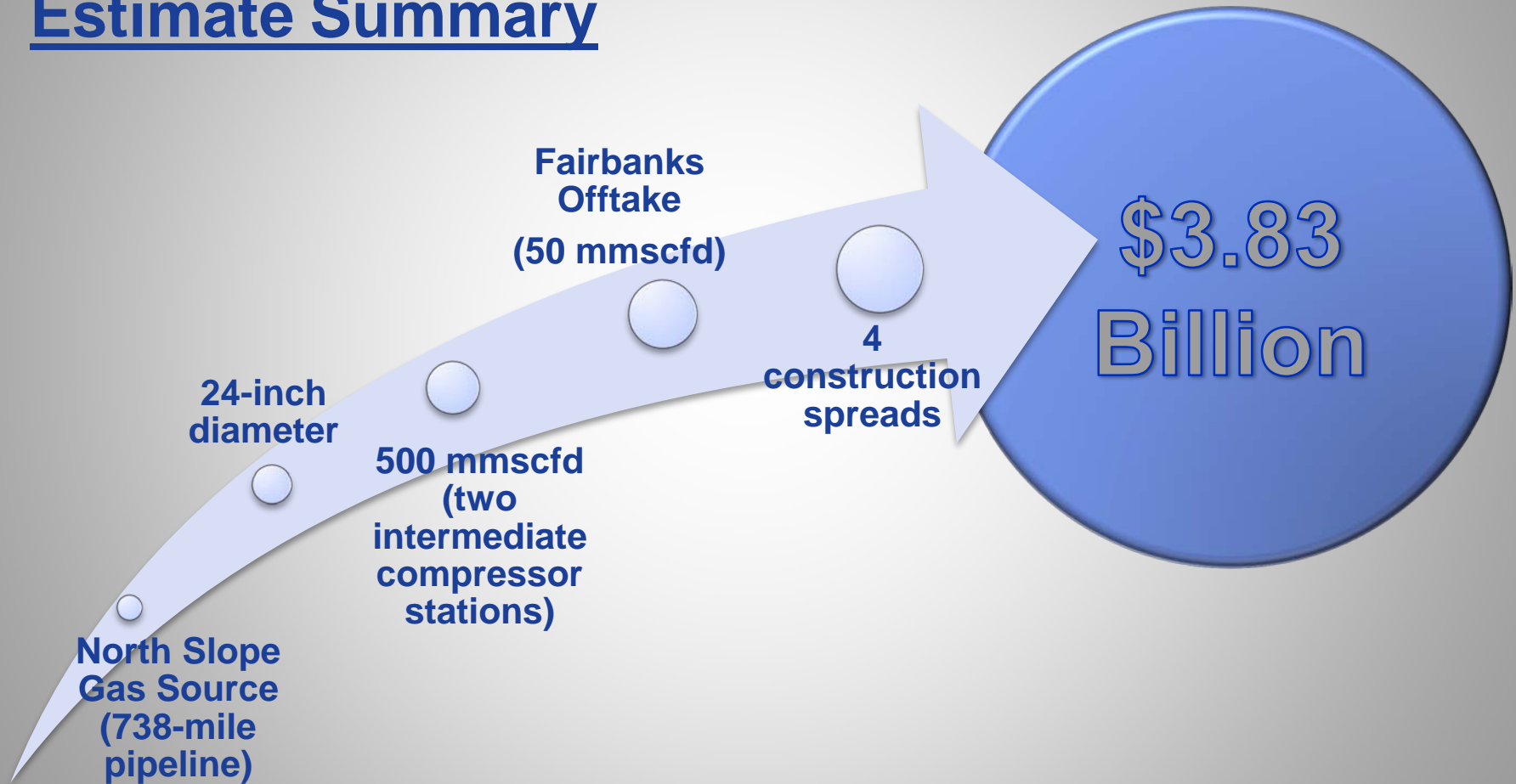
Estimate Components

● Logistics

- ▶ Logistics plan which includes instate freight costs
- ▶ Estimates for third party man camps
- ▶ General construction plan developed
- ▶ Takes advantage of rail for moving pipe instate as far as Fairbanks (laydown areas along route where logical)

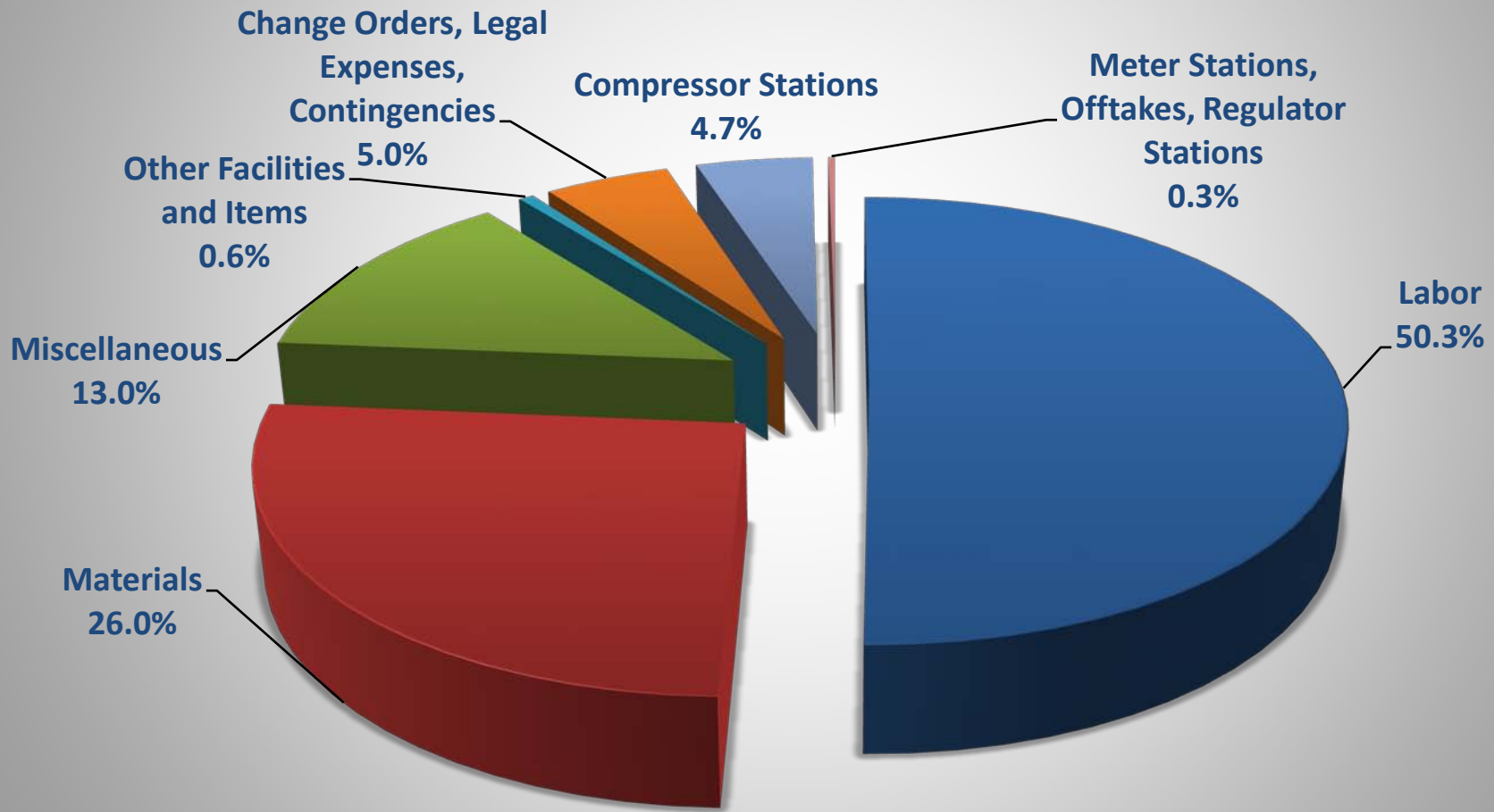
Review of Pipeline Cost Estimates

Estimate Summary



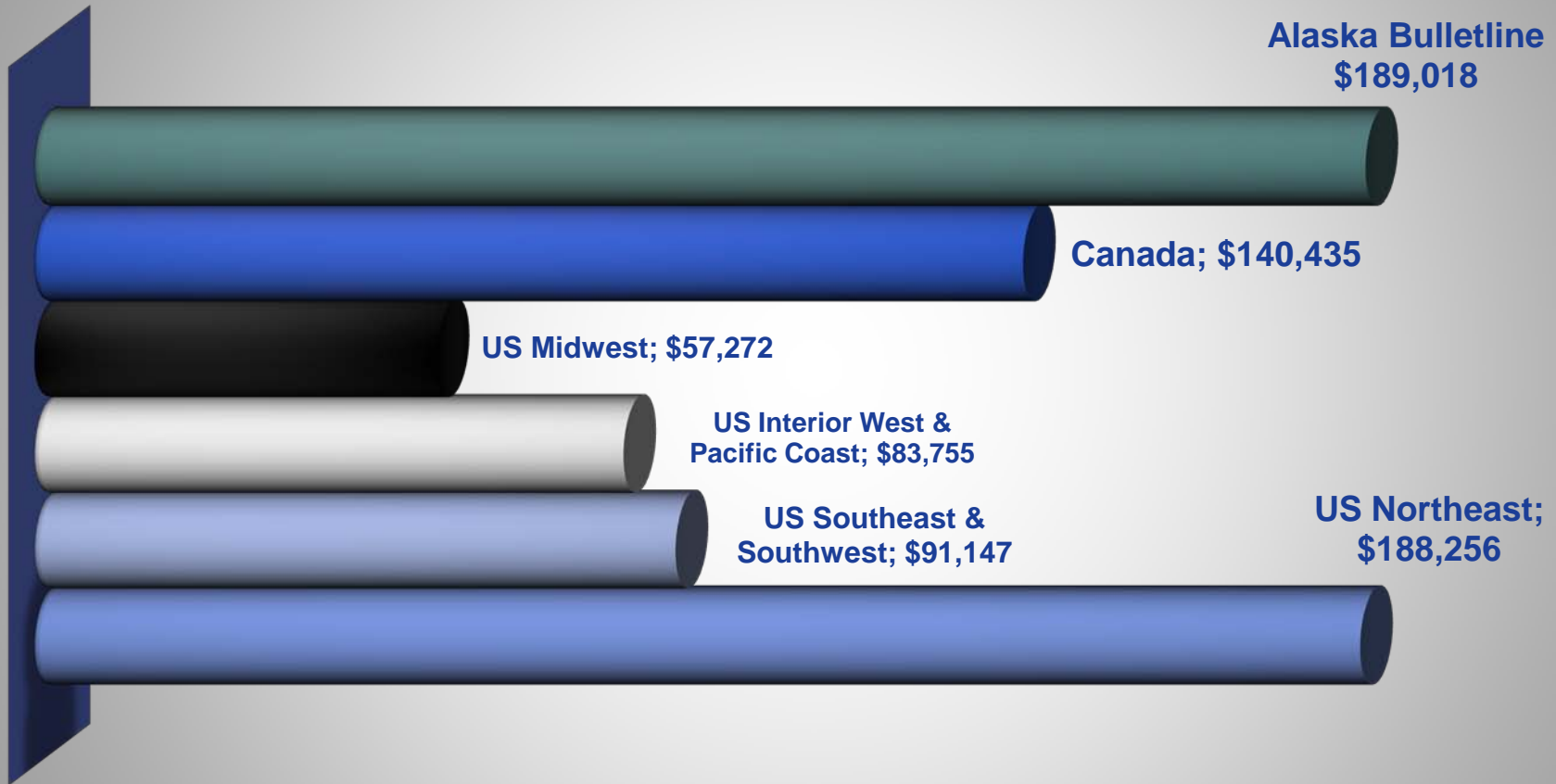
Review of Pipeline Cost Estimates

Allocation of overall cost (as a %)



Review of Pipeline Cost Estimates

Pipeline Project Comparison - by Region (\$/Dia-inch-miles)



Data for projects other than the Alaska Bulletline was found in *North American Pipeline Construction, Ziff Energy, 2008*

Brief Overview of Project

Review of Pipeline Cost Estimate

Cost of Transport

Gas Storage in Cook Inlet

Cost of Transport

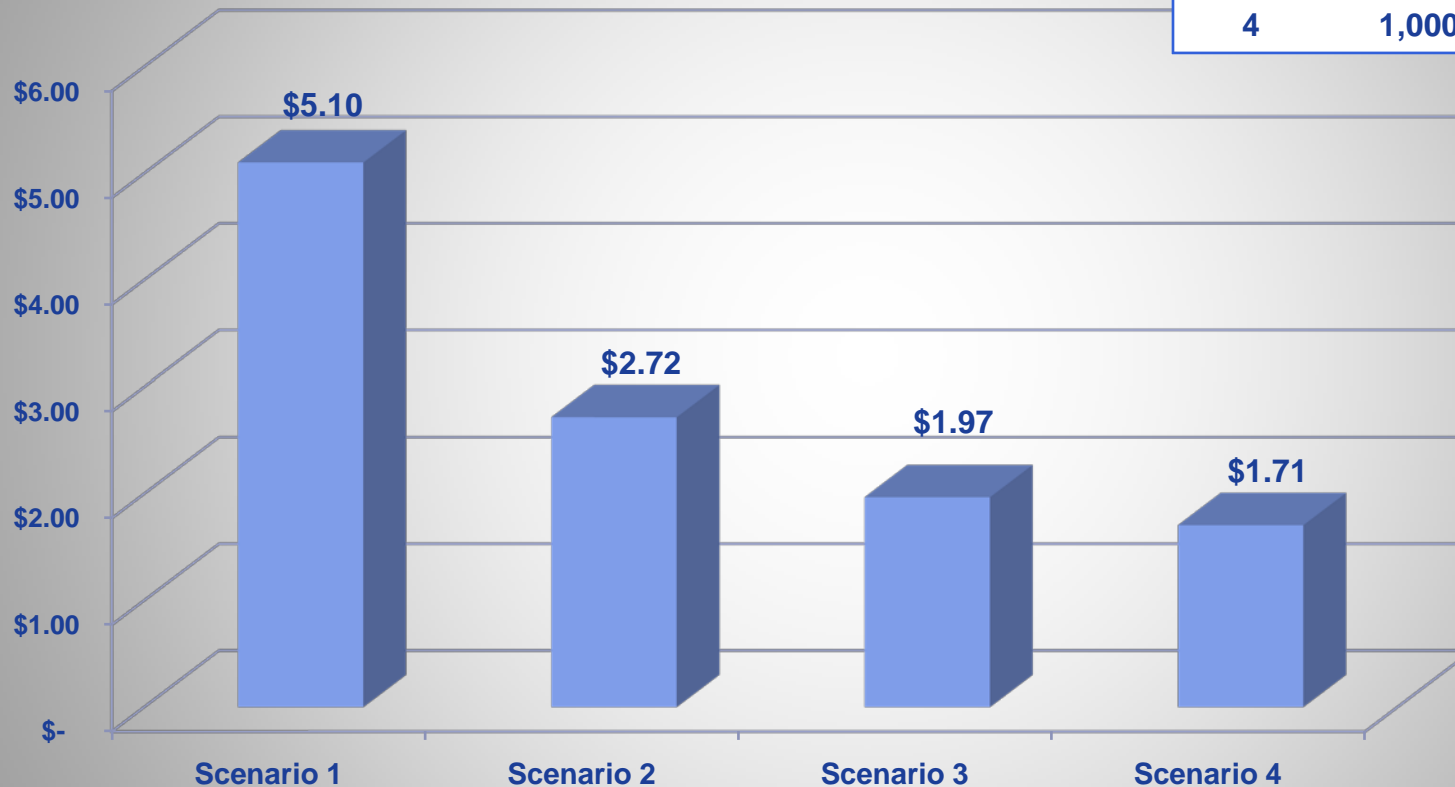
Assumptions

- 70/30 Debt to Equity Ratio: 5.25% debt, 12.55% equity
- Inflation Factors: 2% AFUDC, 4% tariff for post construction
- O&M includes labor, consumables, fuel, facilities, equipment, etc.
- Property Tax: 2%
- Base capital cost: \$3.83B, which included two compressor plants, was adjusted upward to \$4.57B driven by the Cost of Money (8.0% annually), Inflation (2.0%), and removal of compressor costs

Cost of Transport

Scenario	Flow Rate [MMscfd]	No. of Compressor Stations	Project Cost [Billions]
1	250	0	\$4.57
2	500	2	\$4.77
3	750	5	\$5.07
4	1,000	11	\$5.67

25-Year Levelized Cost of Transport



Assumes: \$4.571 Billion base cost, \$4.00/Mcf Fuel Cost, \$100MM per Compression Station
Does not include: GCP, Annual CapEx, or Commodity Cost



Brief Overview of Project

Review of Pipeline Cost Estimate

Cost of Transport

Gas Storage in Cook Inlet

Gas Storage in Cook Inlet

General Details for “New Cook Inlet” Storage

- Long term needs could approach 20 BCF by 2020
- Provide seasonal and winter peaking deliverability
- Storage needed by winter 2011/2012
- To meet the aggressive schedule the permitting and construction process must proceed in a timely manner

Gas Storage in Cook Inlet

Storage Utilization

- Solves seasonal and peaking issues beginning winter 2011/12
- Provide storage for possible imported gas
- Improve utilization of Stand Alone Line through constant flow
- Provide supply backup for Cook Inlet and possibly for Fairbanks when served off of Stand Alone Line

Gas Storage in Cook Inlet

Current Status

- Cost of Service development
- Regulatory and Permitting
- Logistics
- Procurement of storage reservoir

Project Team Cost Estimate Review

- The Project Team has reviewed ENSTAR's cost estimate:
 - Consistent with current level of development (Parks Hwy)
 - Pipeline costs are comparable to historical cost estimates
 - Compressor Stations cost dependent on throughput
 - Does not include:
 - Gas Conditioning
 - NGL Plants

Engineering Work Plan

- Purpose: Develop Cost of Transport
 - Cost of Transport for Reference Case and Various Configurations
 - Increase Level of Confidence in System Cost Estimates
 - Assist in Identifying Potentially Viable Project Configurations
 - Provide documentation to Interested Parties
- Scope:
 - Revised Cost of Transport
 - Prepare Asset Package

Cost of Transport

- Two Phase Development
 - Early summer 2010 Cost of Transport delivery focused on:
 - Facility Costs - Reference and Permutations
 - Incorporating newly available Legacy Data
 - Late 2010 Cost of Transport delivery focused on:
 - Incorporating Field Program Data

Facilities Work Plan

- Develop Design Basis
- Develop schematic flow diagrams and subsequent cost estimates
 - Process flow simulations
 - Generate Process Flow Diagrams (PFD) with major equipment for cost estimation
 - Cost estimation: Larkspur & cost estimation database software
 - Component by component basis
 - Conditioning train
 - NGL train
 - NGL fractionation and storage

Potential Project Configurations

■ Prudhoe Options*

- Reference Case
- CGF Residue Gas
 - North Slope Gas Conditioning with Cook Inlet NGL extraction
 - Conditioning and NGL extraction in Cook Inlet
- CGF Residue Gas / Stabilizer Overhead Blend
 - North Slope Gas Conditioning with Cook Inlet NGL extraction
 - Conditioning and NGL extraction in Cook Inlet

■ Pt. Thomson Stand Alone Options*

- Conditioning on North Slope
- Conditioning and NGL Extraction Cook Inlet

■ Gubik Add-in Case*

*Requires producer input

Potential Project Configurations

■ Prudhoe Options*

- Reference Case
- CGF Residue Gas
 - North Slope Gas Conditioning with Cook Inlet NGL extraction
 - Conditioning and NGL extraction in Cook Inlet
- CGF Residue Gas / Stabilizer Overhead Blend
 - North Slope Gas Conditioning with Cook Inlet NGL extraction
 - Conditioning and NGL extraction in Cook Inlet

■ Pt. Thomson Stand Alone Options*

- Conditioning on North Slope
- Conditioning and NGL Extraction Cook Inlet

■ Gubik Add-in Case*

*Requires producer input

Potential Project Configurations

■ Pipeline Flow Rates

- 250 MMscfd
 - Lower flow configuration will evaluate 16-18 inch Pipeline
- 500 MMscfd
 - One or two Compressor Stations
- 750 MMscfd
 - Five Compressor Stations
- 1000 MMscfd
 - Up to eleven compressor stations

Pipeline Work Plan

- Investigate cost reduction opportunities
- Conduct field verification investigation
- Develop Design Basis
- Develop Design Criteria and Procedures
- Documentation

Pipeline Work Plan

- Investigate Cost Reduction Opportunities
 - Improve Route Constructability
 - Optimize Pipeline Hydraulics
 - Length Reduction
 - Reduce ROW preparation and reclamation work
 - Investigate replacing compressor station refrigeration with air coolers
 - Collect historical legacy data
- Refining the mile-by-mile characterization of line

Pipeline Work Plan

- Field Investigation
 - River Crossing Assessment and Verification
 - Geotechnical Borehole Program
 - Material Site Program
 - Collaborate with ADOT&PF
 - Assess current sites
 - Identify and verify new sites
 - Characterize Active Fault Crossings
 - Constructability Assessment
 - Characterize Roads, Camps, Storage Yards

Project Documentation

- Design Basis
- Design Criteria & Procedures
- Technical Description of Pipeline and Facilities
- Updated Construction and Logistics Plan
- Alignment Sheet Series (GIS)

Update Pipeline Design Basis

Design Documentation

- Alignment
- Geohazards
- Operating Envelopes
- Welding
- Specification
- Crossings
- Depth of Cover / Clearance
- SCADA
- Ditch Modes
- Hydro testing
- Right of Way
- Corrosion Control
- Field Investigations
- Facilities
- Civil Grading
- Climatic Data
- Access Roads
- Stress Analysis

Design Criteria and Procedures

- Construction, Operation and Regulatory Requirements
- Design Criteria
 - Facilities
 - Pipeline
 - Temporary Facilities
- Design Procedures from Criteria

Technical Description of Facilities and Pipeline

- Facilities

- Process Flow Diagrams
- General Arrangements/Site Layouts
- Identification of major equipment

- Pipeline

- Mile by Mile Description of Design
 - Spreadsheet summary of complete design
 - For use by cost estimators and Logistics Planners

Update Construction & Logistics Plan

- In-State Infrastructure Assessment
 - Identify system limitations
 - Ports
 - Bridges
 - Airports
 - Identify, evaluate mitigation
 - Collaborate with ADOT&PF
- Project Construction Plan
- Logistics Plan
- Construction Schedule

Alignment Sheets

- Four Volume Series
 - Geotechnical
 - Civil Construction
 - Land Status / Right of Way
 - Environmental

Update Cost Estimate

- Develop Facility Cost Estimate
- Update Pipeline Cost Estimate
 - Utilize Existing Work
 - Update Unit Cost Database
 - Update Vendor Quotes
- Keep Separated Facilities and Pipeline estimates
- Two Independent Pipeline Estimates

Status of ROW Permitting Effort

- Background
- 2 Major Parts to the Permitting

EIS / ROW / 404

NTP Construction
Permits

Detailed
engineering design

Seeking Permits For:

- 2000' corridor for the pipeline
- Pad on the North Slope for gas conditioning
- 11 compressor stations (envelope)
- Pad at Point Mackenzie
- Parks Highway route outside the National Park
- Both the Parks Highway route and the Richardson Highway route will be evaluated
- Will include major material sites
- Site specific/individual permits needed for construction and operation will be obtained during the NTP process

Schedule of Permitting

■ Scoping Notice of Intent	November 6, 2009.
■ Scoping Meeting	December 8-14, 2009.
■ Scoping Meeting Report	January 12, 2010.
■ Administrative Draft EIS	May 21, 2010.
■ Draft EIS	July 3, 2010.
■ Public comment period	July 28 – September 15, 2010.
■ Compilation of comments, oral & written	October 7, 2010.
■ Administrative Final EIS	November 10, 2010.
■ Final EIS	December 21, 2010.

Wrap-up

Summary

- The State's work program is on schedule.
- Work remains to refine the "cost of transport" estimates:
 - ENSTAR's numbers indicate that the project may be commercially viable.
- We need help from the North Slope producers:
 - How can the cost of gas treatment be reduced?
 - Are NGL's marketable if available at tidewater?
 - export

■ Buyers/sellers of gas

- Could you identify non-commodity price issues that this project needs to address?
- At the appropriate time it would be useful to know if buyers/sellers of gas are interested in starting discussions about Letters of Intent

Proposed next Update

Mid-February 2010