

SCOMM

155:11

ALASKA STATE LEGISLATURE

Senator Charlie Huggins, Chair
Senate Special Committee on Energy
State Capitol, Room 119
Juneau, AK 99801
Phone: 465-3878
Fax: 465-3265



Representative John Harris, Chair
House Rules Subcommittee on AGIA
State Capitol, Room 208
Juneau, AK 99801
Phone: 465-4859
Fax: 465-3799

Third Special Session
Twenty-Fifth Legislature

Carlson Center, Fairbanks Alaska
Saturday June 14 2008
10:00-5:00 p.m.

Joint Meeting AGENDA

Presentations: Review of AGIA Findings and Determination; Natural Gas Pipeline Project as proposed by TransCanada Alaska Company, LLC and Foothills Pipelines Ltd. (TC Alaska) to the State of Alaska.

➤ **TransCanada's AGIA Application**

Tony Palmer, Vice President, Alaska Gas Development

➤ **Public Testimony**

Testimony – Time Limit May Be Set

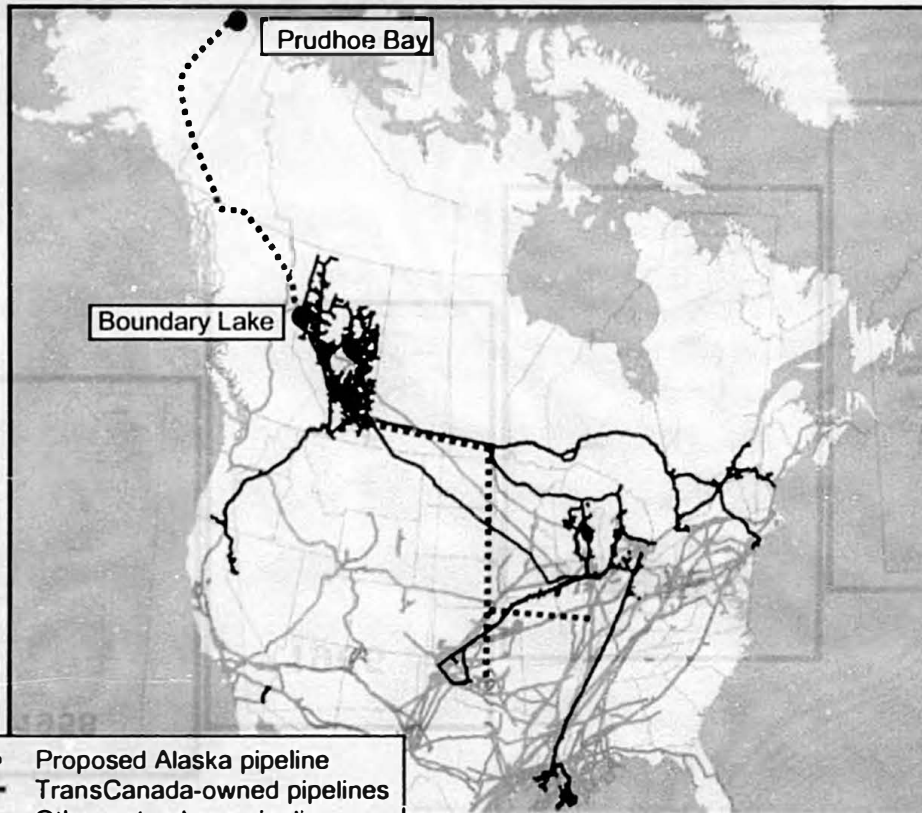
Teleconference

TransCanada's Objectives – Alaska Project



- Early in-service
 - Largest investment opportunity in core business line and geographic footprint
 - Utilize spare capacity on existing North American pipelines
 - LNG market as alternative investment opportunity
- Encourage long-run basin development
 - Serve In-State and other markets
 - Increase market and supply diversity
 - Growth investment opportunities
 - Pipeline expansions can create “virtuous circle”
 - Pipeline expansions promote more exploration and drilling which, if successful, leads to more pipeline expansions
- Equitable treatment for all customers
 - 50-year successful track record of balancing interests
 - Initial and future
 - Large and small

TransCanada's Credentials

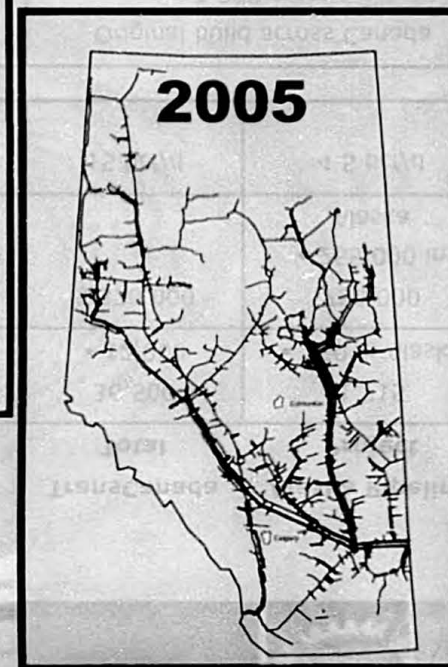
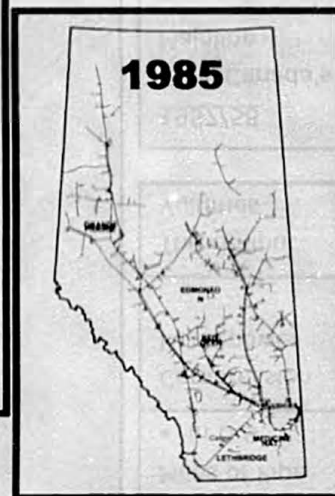
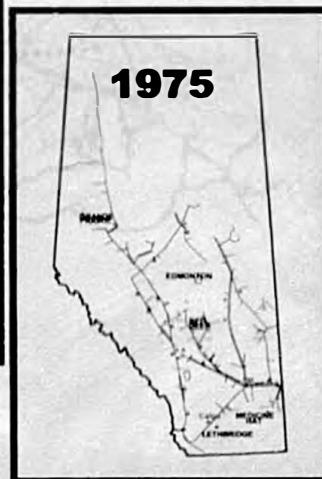
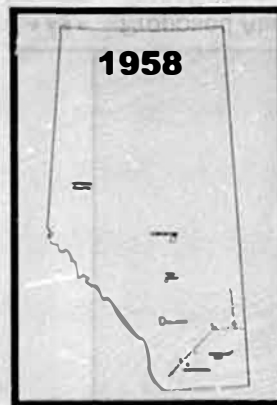


- Proposed Alaska pipeline
- TransCanada-owned pipelines
- Other natural gas pipelines
- Keystone pipeline

	TransCanada Total	Alaska Pipeline Project
Miles of Pipe • in U.S.	36,500 • 12,000	1,715 • 750 in Alaska
Compression Horsepower	5,370,000	750,000 • 265,000 in Alaska
Throughput Volumes	15 bcf/d	4.5 bcf/d

<u>1957/58</u> TransCanada's Mainline	Original build across Canada 2,300 miles
<u>1990s</u> Expansion	7,000 miles Completed within 0.6% of budget and on schedule
<u>2008 - 2009</u> Keystone Pipe	2,150 miles New build in U.S. - 1,380 miles

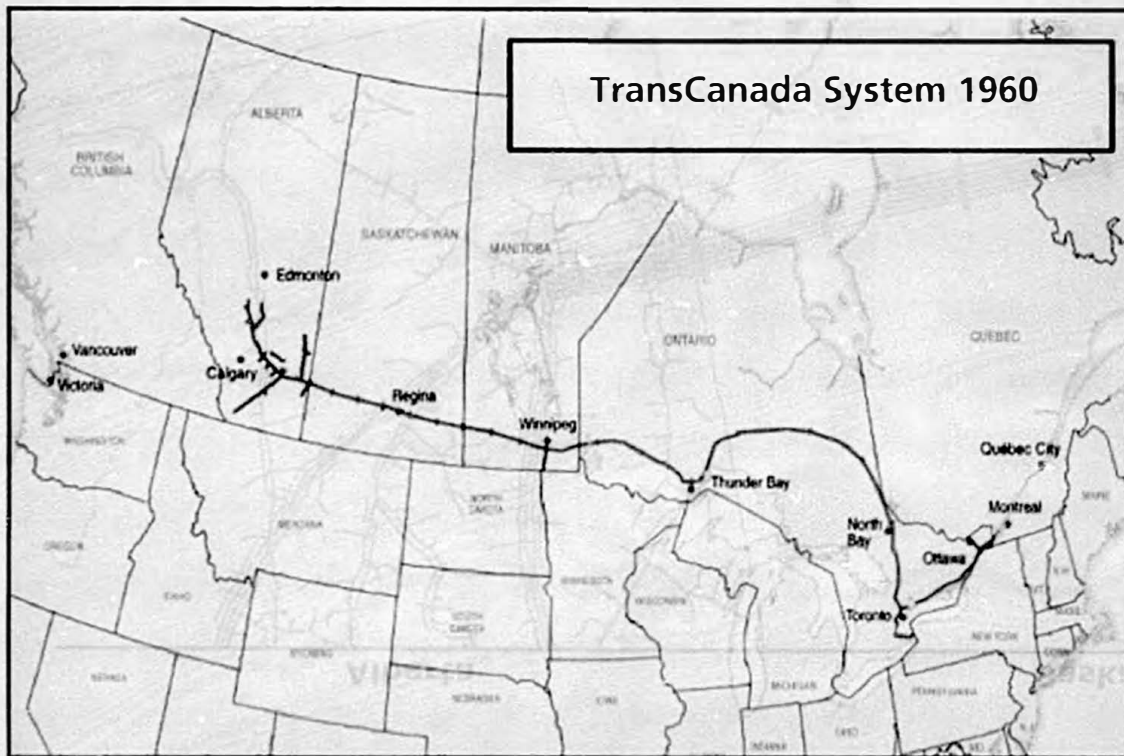
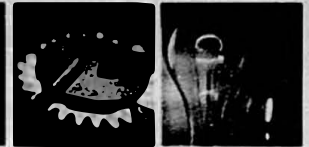
Proven Basin Developer – Alberta Example



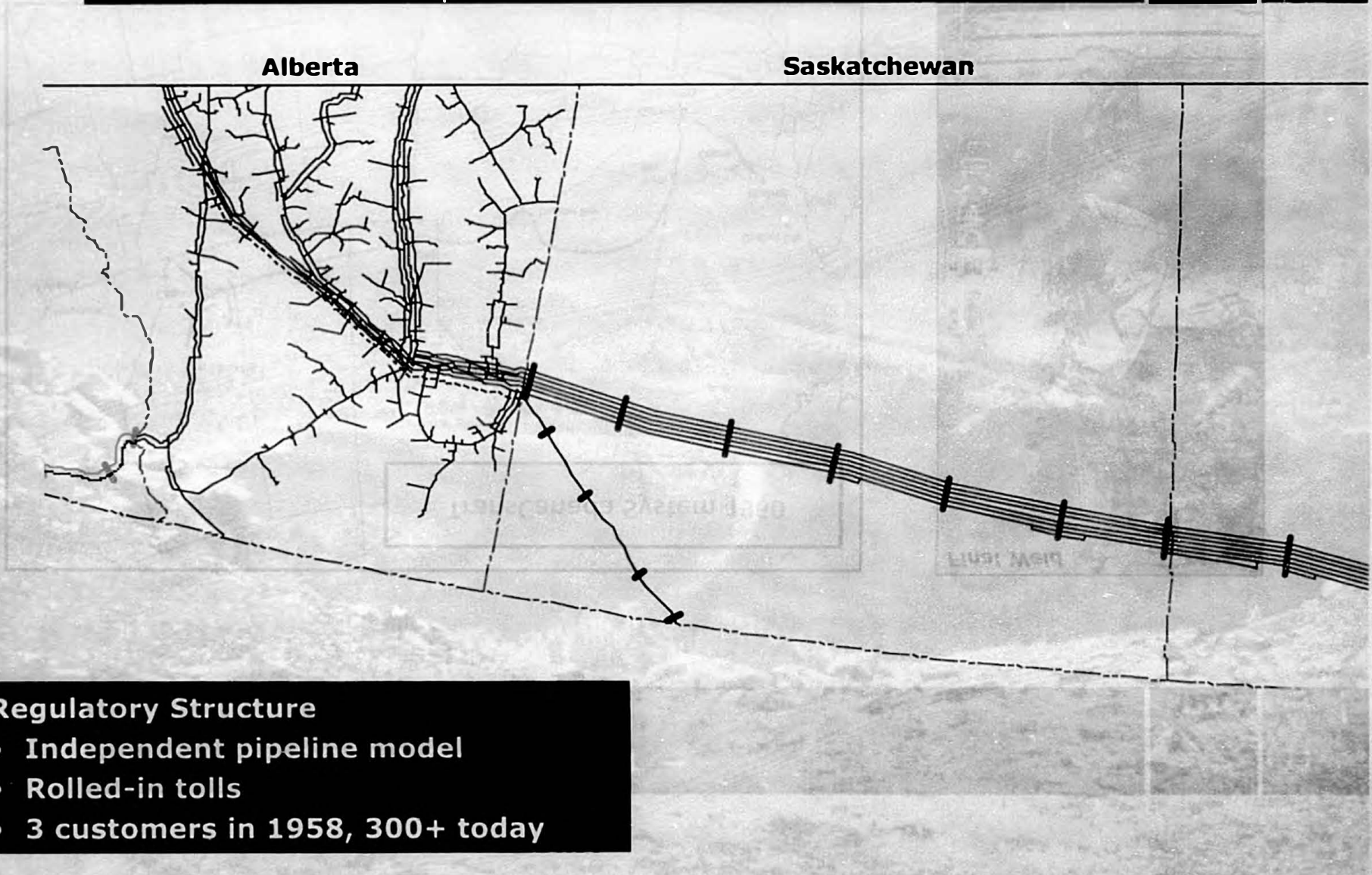
Regulatory Structure

- Independent pipeline model
- Rolled-in tolls
- 3 customers in 1958, 300+ today

Proven Basin Developer – Mainline Example 1960



Proven Basin Developer – Mainline Example 2008



AGIA "Must Haves"



AGIA "Must Haves"	TransCanada's Application	Completeness
1. Filed by deadline	Filed on November 30, 2007	✓
2. Project details & schedule	Alaska Highway route 5 bcf/d GTP and 48" 2500/2600 psi pipe 2017 November in-service*	✓
3. Open season date certain Apply for FERC pre-filing Apply for FERC CPCN	Completed by Sept. 2009* June 2010* - not contingent on Open Season December 2011* - as above	✓
4. RCA filing	N/A	N/A
5. Open season frequency	Once every 2 years	✓
6. Expansions - Commitment to expand in engineering increments	Yes, 4.5 bcf/d initial design capacity Expandable to 5.9 bcf/d with compression only	✓
7. Rolled-in tolls	Up to 115% of initial rates in Alaska Full rolled-in rates in Canada	✓
8. Gas treatment plant	TransCanada will build if 3 rd parties do not	✓
9. State reimbursement	Up to \$500 million	✓

* Subject to AGIA license by April 2008

AGIA "Must Haves"



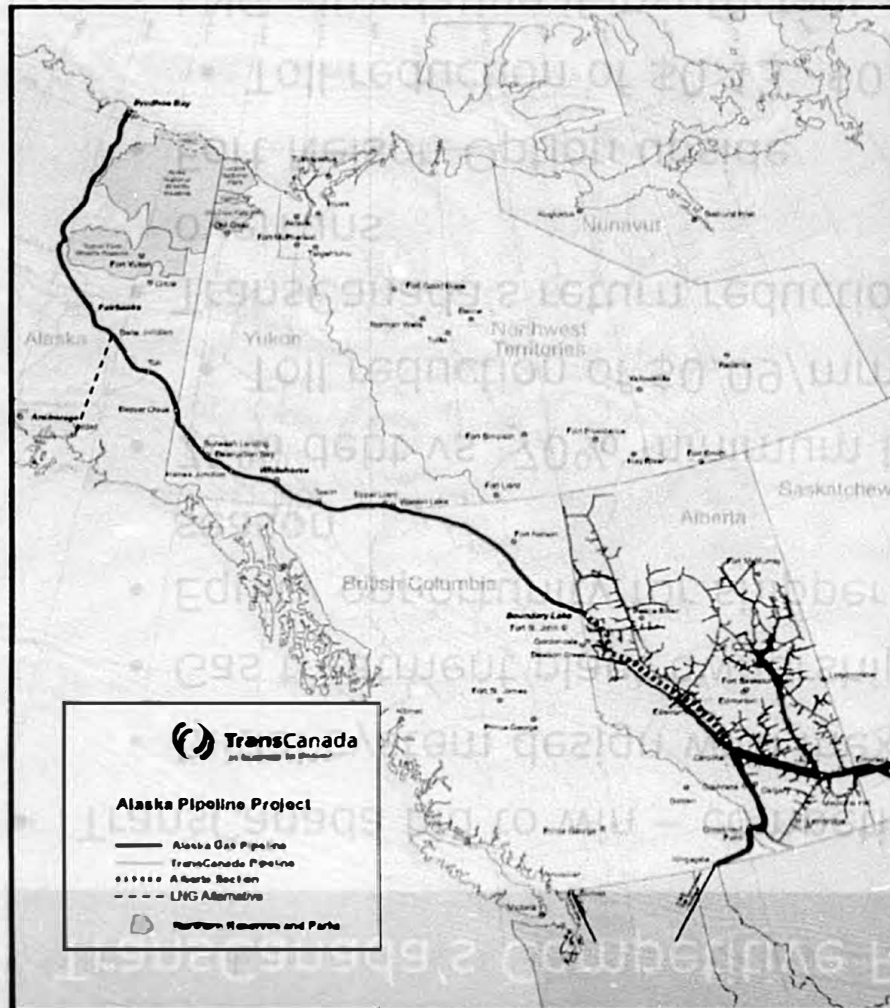
AGIA "Must Haves"	TransCanada's Application	Completeness
10. Project debt ratio minimum	Construction - 70% Operation - 75% (to reduce tolls)	✓
11. Capital cost overrun measures	TransCanada's return reduction (penalty) Potential \$18 B loan guarantee (stable tolls)	✓
12. In-state deliveries	Min. 5 delivery points	✓
13. In-state delivery rates	Distance sensitive rates	✓
14. Local headquarters in Alaska	Yes	✓
15. Local hire, local businesses, etc.	Opportunities for local hire and businesses	✓
16. Waive right to appeal	Waived	✓
17. Project labor agreement	Commit to negotiate PLA	✓
18. Treatment of State reimbursement	Excluded from rate base	✓
19. Details of Applicant	Provided	✓
20. Readiness, financial resources and technical ability of Applicant	Proven record and demonstrated capability	✓

TransCanada's Competitive Response to AGIA



- TransCanada bid to win – competitive enhancements
 - Initial system design with inexpensive expandability
 - Gas treatment plant ownership, if no 3rd party willing to build
 - Equity opportunity for shippers committing gas in initial open season
 - 75% debt vs. 70% minimum limit in AGIA
 - Toll reduction of \$0.09/mmbtu
 - TransCanada's return reduction in event of capital cost overruns
 - Fort Nelson Option upside
 - Toll reduction of \$0.13 -\$0.18/mmbtu
 - LNG alternative if insufficient gas commitments through Canada , or via Y-line

Alaska Pipeline Project



- **Alberta Hub is the most liquid market in North America**
- **TransCanada's Alberta System is the Alberta Hub**
- **Access to all North American markets coast-to-coast on TransCanada's existing pipelines**
 - **By 2018, spare takeaway capacity sufficient for full Alaska volumes**
- **One-third of Alaska pipeline in-service as Prebuild moving 3 BCFD**
- **LNG alternative if insufficient gas commitments through Canada or via Y-line**

Project Description



- Gas treatment plant at Prudhoe Bay
 - 5 Bcf/d initial capacity
 - TransCanada will develop/own only if necessary
- Natural gas pipeline from Prudhoe Bay to Alberta Hub
 - 4.5 Bcf/d initial capacity
 - Expansion to 5.9 Bcf/d with compression only
 - More than 1700 miles
 - 48-inch diameter; 2500/2600 psig
- Alberta Hub to Lower 48
 - TransCanada's existing pipeline system in Alberta is the "Alberta Hub"
 - TransCanada's Alberta pipeline is both a physical and commercial system
 - Largest natural gas trading hub in North America
 - By 2018, downstream pipelines projected to have spare capacity for full Alaska volumes

Project Economics ¹



- Capital costs
 - \$26 billion (2007 \$US excluding AFUDC)
 - Approximately \$0.6 billion for Open Season and regulatory certification
- Tolls
 - \$US 2.76/MMbtu in 2018 to the Alberta Hub
 - Levelized negotiated toll for 4.5 Bcf/d in nominal dollars, including fuel
 - Expansion Tolls
 - Rolled-in tolls in Canada
 - Rolled-in tolls in Alaska up to 115% of initial tolls, including fuel

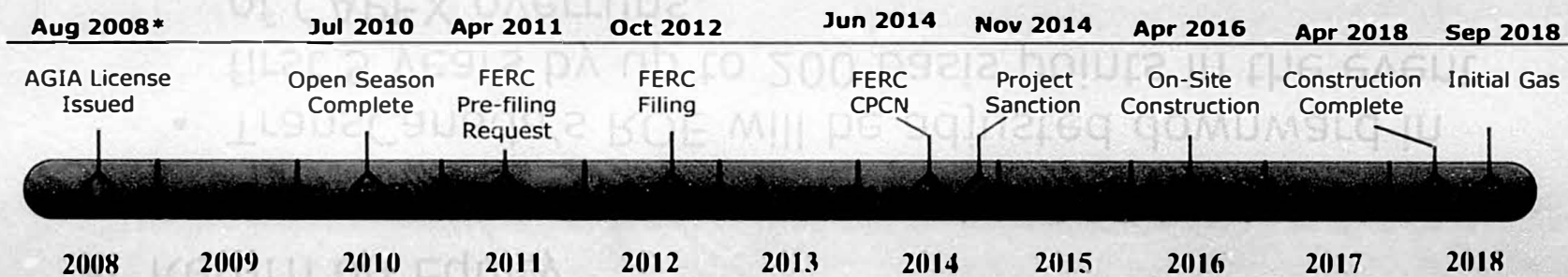
¹ Based on information provided by the State and current TransCanada estimates

Financial Parameters



- Debt/Equity Ratio
 - 70/30 during construction
 - 75/25 upon completion of initial project
 - 60/40 for all expansions
- Return on Equity
 - U.S. 10-year Treasury Note plus 965 basis points
 - TransCanada's ROE will be adjusted downward in first 5 years by up to 200 basis points in the event of CAPEX overruns
- Fuel
 - 7.9% including GTP from Prudhoe Bay to Alberta Hub
 - \$US 0.35/MMbtu in 2018 @ 4.5 Bcf/d

Project Schedule



* AGIA license assumed to be issued in August 2008

Partnership Opportunity

- TransCanada will offer equity opportunity to Shippers in the initial Open Season that subscribe for a threshold volume
 - Should improve likelihood of success and alignment of interests between project sponsors and Shippers

Upstream Fiscal Terms

- TransCanada's AGIA obligations are not conditional on a review of Alaska's upstream fiscal terms.
- TransCanada acknowledges that this issue is between the State and natural gas producers.
 - TransCanada requests that the State review upstream fiscal terms for natural gas prior to the initial open season.

Other Project Components



- Natural Gas Liquids (NGLs) Extraction
 - TransCanada can accommodate NGL extraction in Alaska or downstream
 - TransCanada's Alberta system is straddled by three NGL complexes owned by third parties
 - Excess capacity expected at those plants sufficient to process Alaskan gas if Shippers so choose
- LNG Alternative
 - TransCanada is willing to offer gas treatment and transportation services from Prudhoe Bay to an LNG terminal should insufficient gas be committed through Canada or via a Y-line

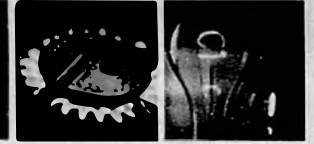
Regulatory Structure



- Alaska
 - TransCanada Alaska Company, LLC will proceed under Alaska Natural Gas Pipeline Act of 2004
- Canada
 - Foothills Pipe Lines Ltd. will proceed under the Northern Pipeline Act (NPA)
- Canada/U.S. Treaty
 - The pipeline will follow the route set out in the Treaty and the NPA



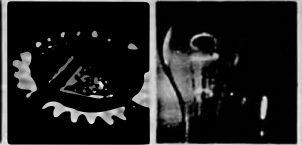
AGIA "Must-haves" Promote Basin Development



- Rolled-in tolls up to 115% of initial rates in Alaska
- Open Season every 2 years
- In-State deliveries
 - Distance-sensitive tolls
 - Minimum 5 delivery points
- Low equity ratio requirement for pipeline sponsors
- State fiscal incentives (if any) targeted to AGIA pipeline shippers



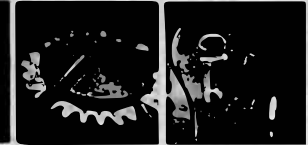
Long-run Basin Development – Pipeline Expansions



- Value to Producers / Governments?
- Does Alaska have enough gas?
- Drilling impacts?
- Impact of rolled-in tolls?
 - Minimum 2 delivery points
 - Distance-sensitive tolls
 - In-state deliveries
 - Open season every 5 years
 - Rolled-in tolls up to 175% of initial rates in Alaska



Value of Potential Expansions (\$Billions)¹

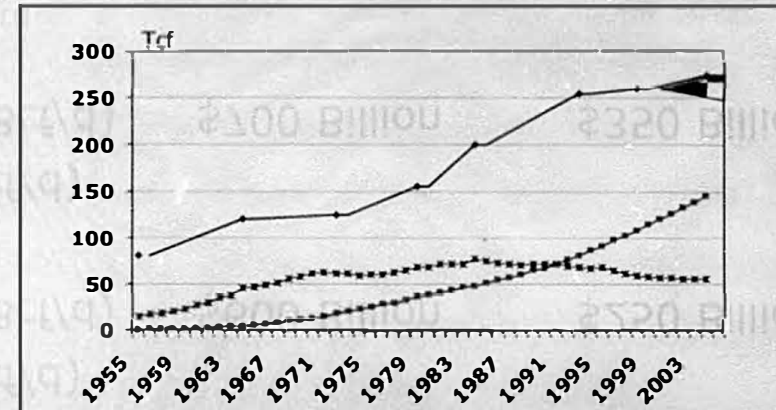
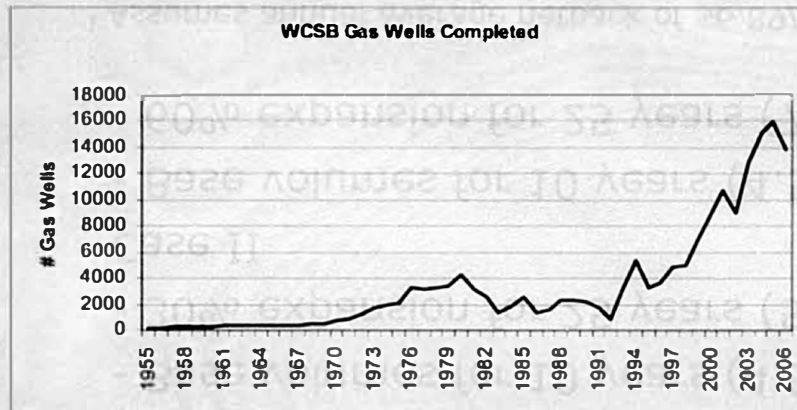
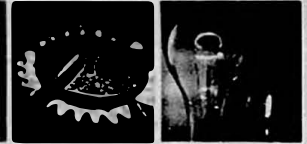


	<u>Producer/Govts. Total Revenue *</u>	<u>Expansion Value</u>
Base Project		
- 25 years @ 4.5 Bcf/d	\$350 Billion	
Expansions		
Case I		
- Base volumes for 10 years (4.5 Bcf/d)		
- 30% expansion for 25 years (5.9 Bcf/d)	\$600 Billion	\$250 Billion
Case II		
- Base volumes for 10 years (4.5 Bcf/d)		
- 60% expansion for 25 years (7.2 Bcf/d)	\$700 Billion	\$350 Billion

¹ Assumes annual average netback of \$6.89/MMbtu

* Direct revenue only
- no indirect impacts from additional E&P activity and spin-offs

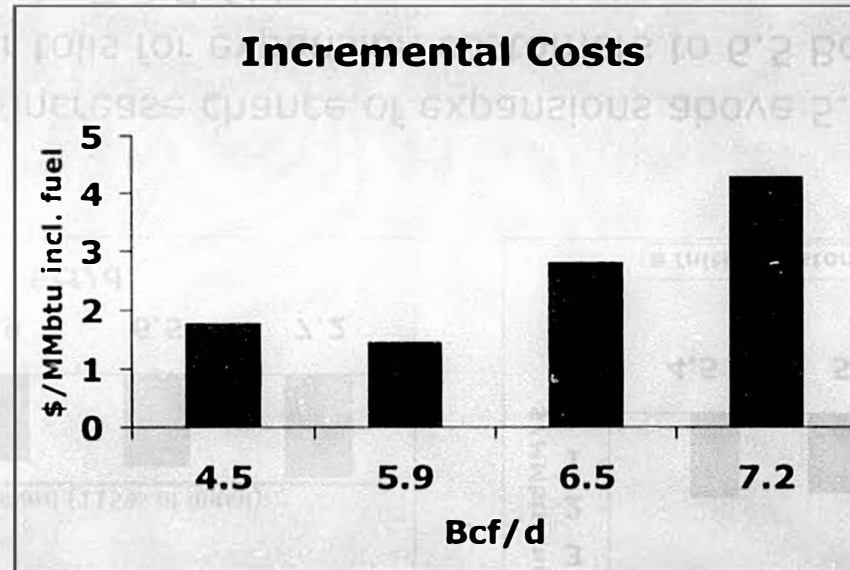
Basin Development – Western Canada Example



Ultimate Resource Potential Estimate
 Proven Reserves
 Cumulative Production

- Pipeline expansion can create “virtuous circle”
 - More exploration and drilling
 - If successful, leads to more pipeline expansion
- Exploration and drilling drives service industry and employment over long term

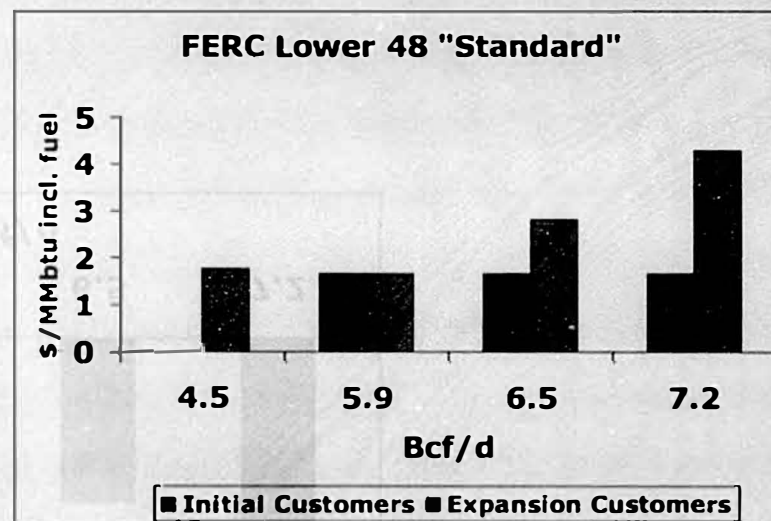
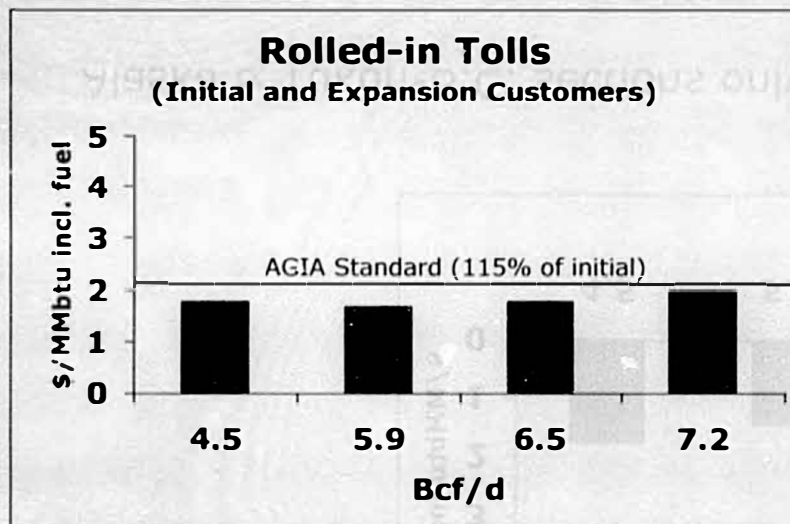
Impact of Rolled-in Tolls?



Alaska & Yukon-B.C. sections only

Assumed Volumes: 4.5 Bcf/d years 1 & 2
5.9 Bcf/d years 3 & 4,
6.5 Bcf/d years 5 & 6,
7.2 Bcf/d years 7 & beyond

Impact of Rolled-in Tolls?

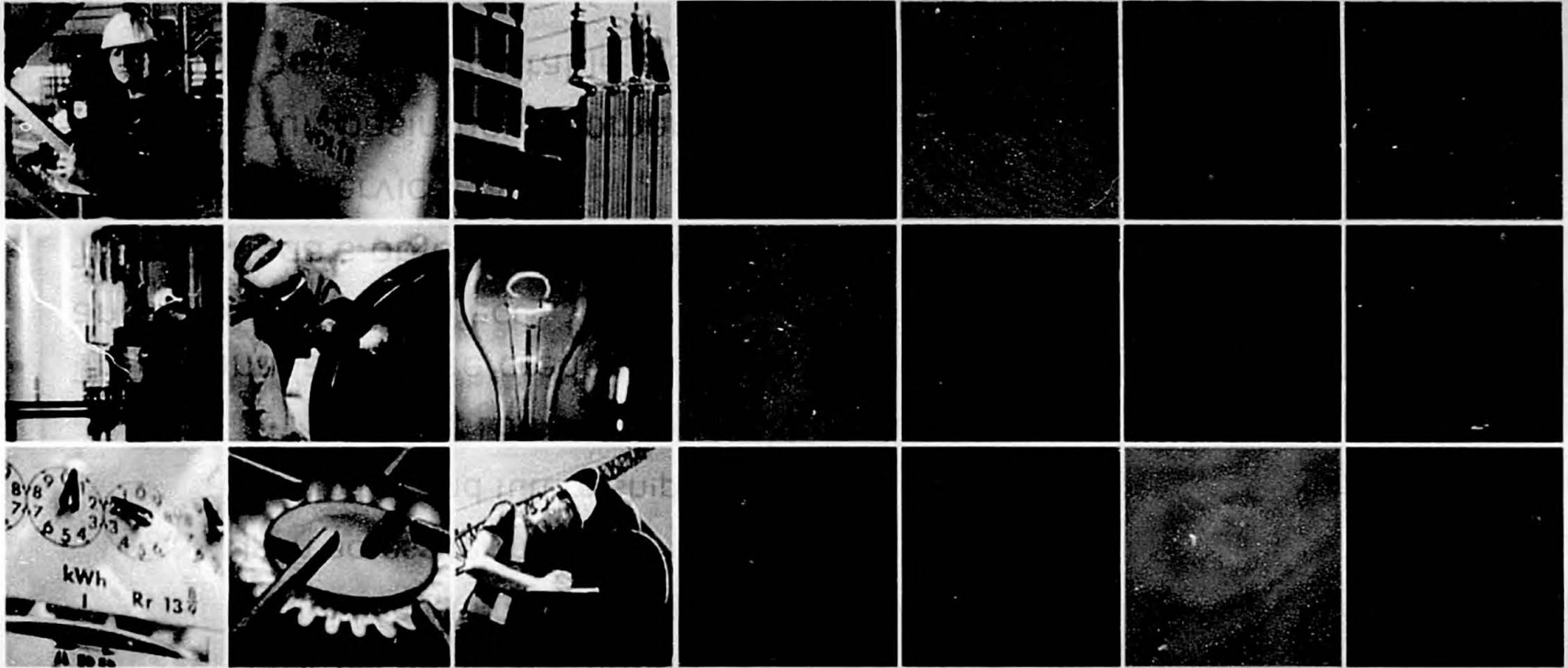


- Rolled-in tolls increase chance of expansions above 5.9 Bcf/d
 - 35% lower tolls for expansion customers to 6.5 Bcf/d
 - 50% lower to 7.2 Bcf/d

Summary



- Last year, the Administration and Legislature established AGIA as Alaska's transparent and competitive process to advance a gas pipeline project
 - AGIA was structured to encourage:
 - Construction of base project
 - Long-run basin development
 - Open access terms for:
 - Initial and future shippers
 - In-State, Lower 48, and LNG markets
- TransCanada has the credentials and capacity to build, own, operate and expand the project
- TransCanada's objectives are aligned with AGIA
 - Early in-service
 - Long-run basin development
 - Open access – equitable treatment for all customers



Thank You



TransCanada

In business to deliver

AGIA

Summary of the Commissioners' Findings and Determination

Special Session
June 2008

1

Commissioners' AGIA Findings and Determination



- The pipeline project proposed by TC Alaska's application
 - will sufficiently maximize the benefits to the people of Alaska, and
 - merits issuance of an AGIA license.
- Issuing an AGIA License to TC Alaska maximizes benefits to Alaskans more than pursuing an LNG project or the Producers Project.

2

Maximizing Benefits to Alaskans



- Get a Pipeline
- Jobs and long-term careers
- Opportunity of affordable energy for Alaskans
- Maximize state revenue and create opportunity for future growth of state economy

3

Maximizing Benefits to Alaskans



- Get a Pipeline
 - A feasible project plan, sponsored by a capable pipeline company
 - An economic project likely to attract firm transportation commitments and secure financing
- Jobs and long-term careers
- Opportunity of affordable energy for Alaskans
- Maximize state revenue and create opportunity for future growth of state economy

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Maximizing Benefits to Alaskans



- Get a Pipeline
- Jobs and long-term careers
 - True “open access” for explorers
- Opportunity for affordable energy for Alaskans
- Maximize state revenue and create opportunity for future growth of state economy

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Maximizing Benefits to Alaskans



- Get a Pipeline
- Jobs and long-term careers
- Opportunity of affordable energy for Alaskans
 - Off-Take Points, and Distance-Sensitive Rates
 - Expansion Provisions
 - Does not interfere with “Bullet Line” project
- Maximize state revenue and create opportunity for future growth of state economy

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Maximizing Benefits to Alaskans



- Get a Pipeline
- Jobs and long-term careers
- Opportunity of affordable energy for Alaskans
- Maximize state revenue and create opportunity for future growth of state economy
 - Lowest Reasonable Transportation Rates (tariff)
 - Expansion Provisions

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TC Alaska Project Evaluation



- Economic Evaluation
 - Net Present Value (NPV) to the State
 - NPV to the Producers
- Likelihood of Success

8

TC Alaska Project Evaluation



- As allowed in AGIA, TC Alaska's application had alternative project designs based on how much gas was committed at the initial open season
- Analysis considered many different possible designs

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NPV Analysis



- Two "Base Cases" Reported for TC Alaska's Project
 - "Proposal Base Case"
 - 4.5 Bcf/d (including 0.9 Bcf/d from Pt. Thomson)
 - 75/25 debt to equity
 - 14% return on equity
 - 25 year shipping contracts
 - "Conservative Base Case"
 - 4.0 Bcf/d (No gas from Pt. Thomson)
 - 75/25 debt to equity
 - 14% return on equity
 - 20 year shipping contracts

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NPV Analysis



- Factors in NPV Analysis
 - Gas Prices
 - Transportation Costs
 - Pipeline Project Capital Costs
 - Cost Escalation Rates
 - Initial Pipeline Throughput
 - Tariff Terms (e.g. debt to equity ratio)
 - Pipeline Construction Schedule
 - Gas Production Costs

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Project Economic Analysis



- Gas Price Models
 - Separate price forecasts were obtained from
 - US DOE's Energy Information Administration (EIA)
 - Wood Mackenzie
 - Gas Strategies Consulting
 - Black and Veatch

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Project Economic Analysis



- Project Cost and Schedule
 - “Technical Team”, included
 - Westney Consulting
 - Energy Project Consultants
 - Pingo International
 - AMEC Paragon
 - Colt Engineering
 - Mustang Management
 - Energy Operations Consulting
 - Black and Veatch
 - Merlin Associates

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Project Economic Analysis



- Project Cost Estimates – Mid-Range
 - Proposal Base Case
 - \$31 Billion in today's dollars
 - \$3.19 tariff
 - \$45 Billion in dollars spent
 - \$4.73 tariff
 - Conservative Base Case
 - \$29 Billion in today's dollars
 - \$3.59 tariff
 - \$42 Billion in dollars spent
 - \$5.33 tariff

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Project Economic Analysis



Project Cost Estimates – Why Higher than TC Alaska's?

- Different Purposes – Project Planning vs. Risk Assessment
- TC Alaska's Cost Estimates are "realistically aggressive" and appropriate for project planning
 - Analytical team tested sensitivity of estimates to changed circumstances
- Difference Between Assumptions Mandated in the RFA and the final analysis assumptions
 - Exchange rate, cost escalation rate
- Assumed "Neutral Competence" of Operator
- Cost of the GTP
 - One vs. Two seasons of sea-lift

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Project Economic Analysis



- Project Schedule
 - Mid-range probability put first gas in 2020
 - State's Canadian Counsel advised on expected regulatory timeline in Canada, including First Nation issues

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Project Economic Analysis



Reporting NPV Results – Proposal Base Case

- Gas Prices (WoodMac)
- Transportation Costs
 - Pipeline Project Capital Costs (\$31.5 billion)
 - Cost Escalation Rates (4%)
 - Initial Pipeline Throughput (4.5 Bcf/d)
 - Tariff Terms (e.g. debt to equity ratio[75/25])
- Pipeline Construction Schedule (2020)
- Gas Production Costs

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Project Economic Analysis



Proposal Base Case Results

- The State of Alaska would realize an estimated cash flow of \$261.5 billion, and an estimated NPV of approximately \$66.1 billion at a discount rate of 5%.
- The Major North Slope Producers would realize an estimated cash flow of \$147.4 billion, and an estimated NPV of approximately \$13.5 billion at a discount rate of 10%.

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Project Economic Analysis

AGIA
The Alaska Gasline Inducement Act

Conservative Base Case Results

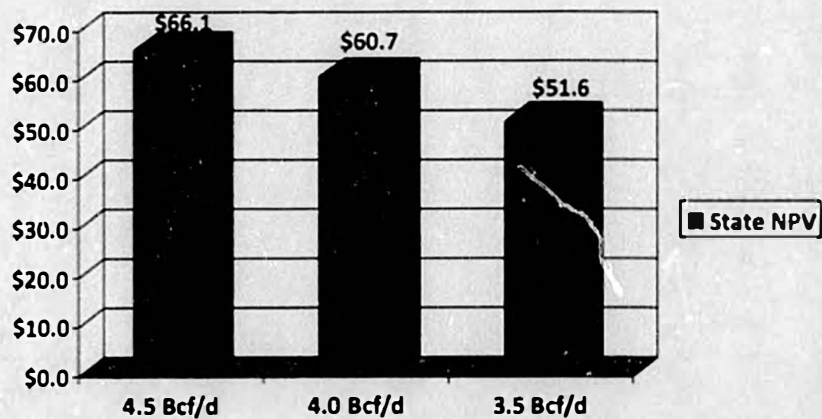
- The State's NPV decreases by 8% from the Proposal Base Case to \$60.7 billion.
- The Major North Slope Producers NPV decreases by 9% to \$12.3 billion.

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Project Economic Analysis

AGIA
The Alaska Gasline Inducement Act

State NPV at Various Initial Throughput



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Project Economic Analysis



- The Project Economics are Extremely Robust
 - It would take a “perfect storm” of worst case scenarios of multiple factors for the Project to be uneconomic to the Producers.
 - Indeed, a “perfect storm” of low gas prices and high construction costs, together, are not enough to generate a negative NPV for the State.

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\$500 Million Matching Contribution



Effect of State's \$500 Million Matching Contribution to TC Alaska's Project

- Tariff is reduced by 6 cents
- State's NPV increases by \$200 Million

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TC Alaska Project Is Likely to Succeed



- TC Alaska has submitted a plan for its project that is technically feasible, reasonable, and specific.
- TC Alaska has demonstrated the technical and financial ability to construct the project.
- TC Alaska has submitted a reasonable commercial plan which, coupled with economic and political factors, should help to encourage firm shipping commitments

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Attracting Gas Commitments to TC Alaska's Project



- Robust economics and reasonable commercial terms.
- Extremely capable pipeline company.
- State's Upstream Inducements
 - 10-year tax certainty
 - Royalty valuation certainty
- Avoid Problems of Not Committing Gas
 - Duty to develop
 - Anti-trust
 - Congressional Attention
 - Shareholder Questions

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TC Alaska Project Is Likely to Succeed



Contingent Liability Issue

- Risk of litigation is significantly overstated.
- Potential legal claims by withdrawn partners are, at best, weak and unlikely to succeed.
- Not a reasonable basis for the Major North Slope Producers to refrain from partnering with TC Alaska or contracting with the Project.

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TC Alaska Project Comparisons



- Producer Project (Denali)
- LNG Options

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Denali Project Is More Risky For the State



- Lack of commitments create risks for state
- No certainty on project schedule
 - Likely Anti-trust Challenges
- Undefined tariff terms
 - Example, 50/50 debt to equity increases the tariff by \$1 compared to 75/25, costing the state over \$8 billion in NPV
- Undefined state fiscal concessions needed for Denali
 - SGDA concessions worth over \$10 billion
- No Certainty on Expansion Provisions
 - Producer Incentives to exercise basin control
 - Stifles North Slope basin development
 - Loss of long-term jobs and careers
 - Loss of Potential LNG development

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Producer Pipeline Considerations



- Even if TC Alaska License is issued, Producers can proceed with Denali, commit gas to it, and build it without any additional state concessions
- State has significant interest in attracting Producers to commit gas to TC Alaska's project
 - Expansion Provisions
 - Lowest reasonable tariff - Highest Netback
- State Needs to Use Power of Competition to Protect Alaskans Interests

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LNG Analysis



- Extensive Analysis of LNG economics and likelihood of success
 - Asian market price
 - LNG project costs and schedule
 - How LNG projects are developed
 - Potential hurdles for LNG projects

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LNG Economic Analysis



- Ran economics on both a 2.7 bcf/d and 4.5 Bcf/d projects
- Alaskan LNG is economical and viable
- Confirmed Asian market premium price
- Liquefaction plant costs create an economic drag
- LNG does not provide time or cost savings over TC Alaska project
- State and Producer NPV lower under all stand-alone LNG options than under TC Alaska project

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LNG Likelihood of Success



- LNG is viable, but less likely to succeed without TC Alaska Project
 - Entire project stream, from gas supply, to pipeline, to liquefaction, to tankers, to re-gasification, to gas sales must be negotiated and executed nearly simultaneously
 - Expansions are more difficult because of size
 - Export authorization is a challenge

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Opportunity for “Y line” LNG



- If gas is committed, TC Alaska will transport gas from Delta Junction to Prince William Sound
- LNG project will benefit from TC Alaska’s financial and technical capabilities
- State will benefit from supplying gas to both LNG and North American markets
- “Y line” is the best LNG option for the state

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Additional Considerations



- Treble Damages Exposure
- Competition

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Treble Damages Exposure



\$Millions

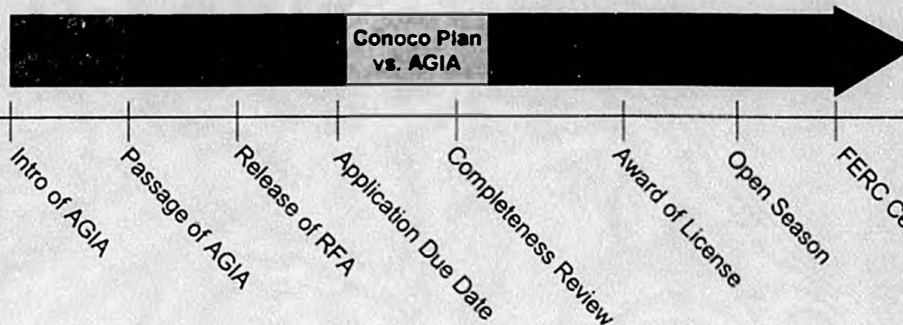
Year	Annual Spend	State Expenditure	TC Alaska Expenditure	3x TC Alaska Expenditure	Cumulative State Exposure
2008	\$41	\$21	\$21	\$62	\$82
2009*	\$42	\$21	\$21	\$63	\$166
2009	\$34	\$31	\$3	\$10	\$207
2010	\$141	\$127	\$14	\$42	\$376
2011	\$144	\$130	\$14	\$43	\$549
2012	\$147	\$132	\$15	\$44	\$726
2013	\$75	\$39	\$36	\$109	\$874
Total	\$625	\$500	\$125	\$374	\$874

*Scheduled Open Season

Expenditure Schedule Based on TC Alaska Application

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Competition



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Summary



- TC Alaska's Project Maximizes Benefits to Alaskans
 - Best Chance to Get a Pipeline
 - Expansion Provisions Provide Best Chance for Jobs and Long-Term Careers for Alaskans
 - Increases Alaskans Opportunity of Affordable Energy
 - Maximizes State Revenue
- TC Alaska's Project is Better for the State than LNG Options and the Producer Project (Denali)

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Presentation Schedule & Participants

(Please note schedule subject to change at Chairman's discretion)

June 12 - Fairbanks 10 a.m. to 5 p.m.

Carlson Center **In-State Gas**

(ALL 3 DAYS) AK Gasline Port Authority - Bill Walker

AK Natural Gas Dev. Authority - Harold Heinze

Enstar - Curtis Thayer

Evening Event @ Pike's Greenhouse 6 - 7:30 p.m.

June 13 - Fairbanks 10 a.m. to 5 p.m.

TransCanada - Tony Palmer

Administration

Evening Event @ UAF 5 - 7 p.m.

June 14 - Fairbanks 10 a.m. to 5 p.m.

TransCanada - Tony Palmer

Administration

(continuation of 6/13 if needed)

PUBLIC TESTIMONY

June 16 - Anch. 9 a.m. to 5 p.m.

Howard Johnsons **Regulatory Agencies**

4th & C Streets FERC - Mark Robinson - Director

(ALL WEEK) Office of Energy Projects

Federal Energy Regulatory Commission

Regulatory

Comm. Of Alaska - Anthony Price

Commissioner, Chair

June 17 - Anch. 9 a.m. to 5 p.m.

Point Thomson Unit

Nan Thompson - DNR / Div. O&G @ 9a.m.

Cathy Foerster - AOGCC Commissioner @ 11a.m.

ExxonMobil - Craig Haymes

Chevron - John Zager

June 18 - Anch. 9 a.m. to 5 p.m.

TransCanada - Tony Palmer

Administration

6 p.m. to 8 p.m. PUBLIC TESTIMONY

June 19 - Anch. 9 a.m. to 5 p.m.

TransCanada - Tony Palmer

Administration

6 p.m. to 8 p.m. PUBLIC TESTIMONY

June 20 - Anch. 9 a.m. to 5 p.m.

In-State Gas

AK Natural Gas Dev. Authority - Harold Heinze

Enstar - Curtis Thayer, Gene Dubay, Andrew White

AK Natural Res. to Liquids - Richard Peterson

EconOne - Barry Pulliam

AK Gasline Port Authority, Bill Walker

Craig Richards

80/11/0 p.m.
June 24 - Mat Su 1 p.m. to 5 p.m.
Palmer Train Depot TransCanada - Tony Palmer
Administration
6 p.m. to 8 p.m. PUBLIC TESTIMONY

June 26 - Kenai 1 p.m. to 5 p.m.
Soldotna Sports Center TransCanada - Tony Palmer
Administration
6 p.m. to 8 p.m. PUBLIC TESTIMONY

June 30 - Barrow Community Celebration Event

July 1 - Barrow Times To Be Determined
Hopson Middle School TransCanada - Tony Palmer
Administration
PUBLIC TESTIMONY

July 8 - Ketchikan 1 p.m. to 4 p.m.
Ted Ferry Civic Center TransCanada - Tony Palmer
Administration
5 p.m. to 7 p.m. PUBLIC TESTIMONY

- The TC Alaska Project will not preclude construction of a smaller pipeline from the North Slope to Southcentral Alaska. Issuing a license to TC Alaska may increase the likelihood that plans for a "bullet line" or "spur line" will become reality.
- Similar to the failed SGDA contract, the Producer Project is not guaranteed to continue to advance the project to construction or even FERC certification and will likely require undefined concessions from the state. Similar to TAPS, the Producer Project will likely result in commercial terms that do not protect Alaska's interests.
- The TC Alaska Project provides opportunities for significant Producer ownership. If the state determines that additional concessions are needed, they can be added to the TC Alaska Project to ensure that any concessions result in a pipeline that maximizes benefits for Alaskans.

Determination

The commissioners found TC Alaska's application to be complete and in compliance with the AGIA statute and Request for Applications. Following an extensive evaluation process, the commissioners determine that the natural gas pipeline project from the North Slope to Canada proposed by TC Alaska is the project that will sufficiently maximize the benefits to the people of this state. The commissioners further determine that the TC Alaska Project merits the award of a license under AGIA. These Findings and Determination will be submitted to the presiding officers of each house of the Alaska Legislature for approval of the license.

The license will be issued to TC Alaska as soon as practicable after the effective date of a bill approving the license proposed by the commissioners. If a bill is not passed within 60 days of the date that the legislative presiding officers receive this Determination, the commissioners may not issue the proposed license and may request new applications.

This Executive Summary presents an overview of the Written Findings and Determination by the Commissioners of the Alaska Departments of Natural Resources and Revenue for issuance of a License under the Alaska Gasline Inducement Act (AGIA). It summarizes the commissioners' process for evaluating TC Alaska's proposed natural gas pipeline project and the commissioners' determination as provided by AGIA. This Executive Summary is part of the commissioners' Written Findings and Determination that is anticipated to be published on May 28, 2008. This document is a summary only, and is not the commissioners' final determination under AGIA and is not a final agency action.

An Explorer's View of Gas Pipeline Issues

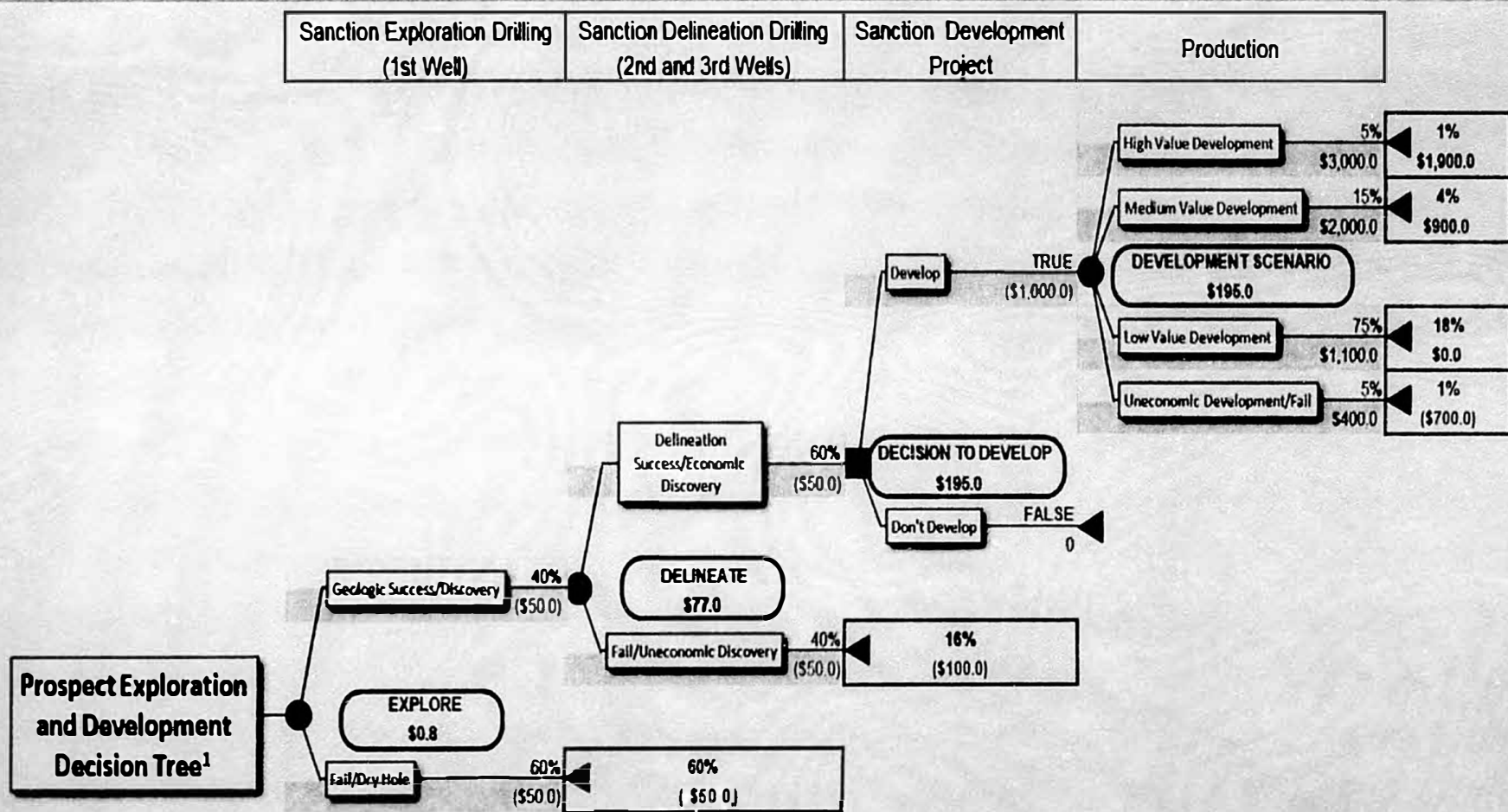
Alaska Division of Oil & Gas
June 7, 2008



Alaska Department of
**Natural
Resources**

<http://www.dog.dnr.state.ak.us/oil/>

Explorer's Decision Tree



¹ Assumes land position already established and prospect is identified and ready to drill.

Key Lessons From the Model

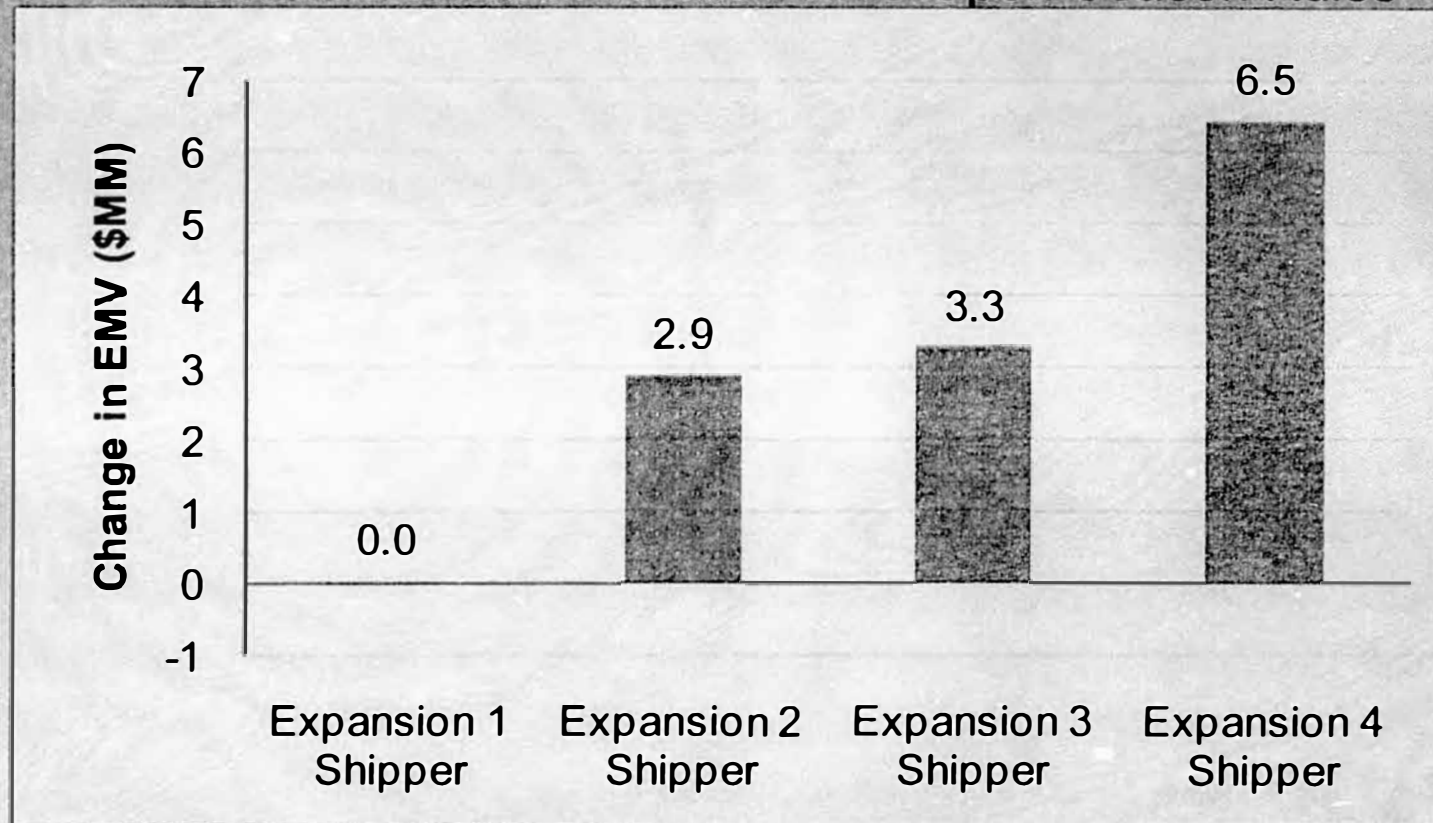
- Exploration is risky: big chance of big spend but no payoff
- Need big payoff from the success leg to pay for the large probability of failure
- If payoff from the success leg isn't sufficiently large, initial exploration never occurs

How AGIA Boosts the Success Leg Payoff

- Lower base tariffs (75/25 debt/equity ratio) increase netbacks
- Lower tariffs through Rolled-in rates also increase netbacks
- Expeditious and predictable timeline, from first spend to first gas, raises *discounted* value of eventual gas sales

Tariff Provisions

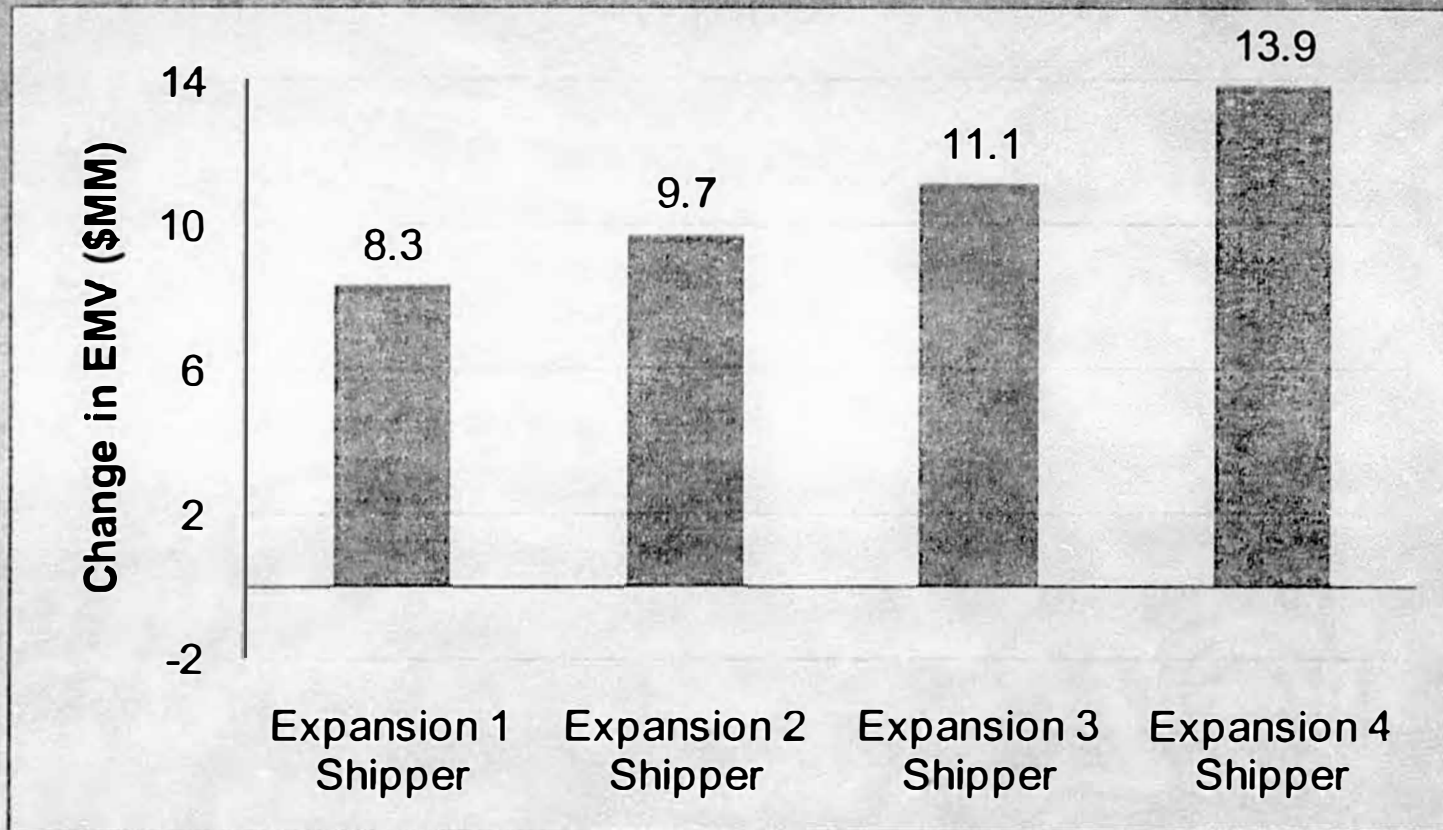
Effect of Rolled-in vs. Incremental
EMV Benefits of AGIA versus FERC Open-Season Rules*



*Expected monetary value (EMV) of a generic North Slope stand-alone gas prospect; 75/25 D/E capital structure for base tariffs, 60/40 for expansions; \$8.00 AECO gas price, flat, real

Tariff Provisions

Effect of Rolled-in, 75/25 D/E vs. Incremental, 50/50 D/E
EMV Benefits of AGIA versus FERC Open-Season Rules*



*Expected monetary value (EMV) of a generic North Slope stand-alone gas prospect; \$8.00 AECO gas price, flat, real

6/12/2008

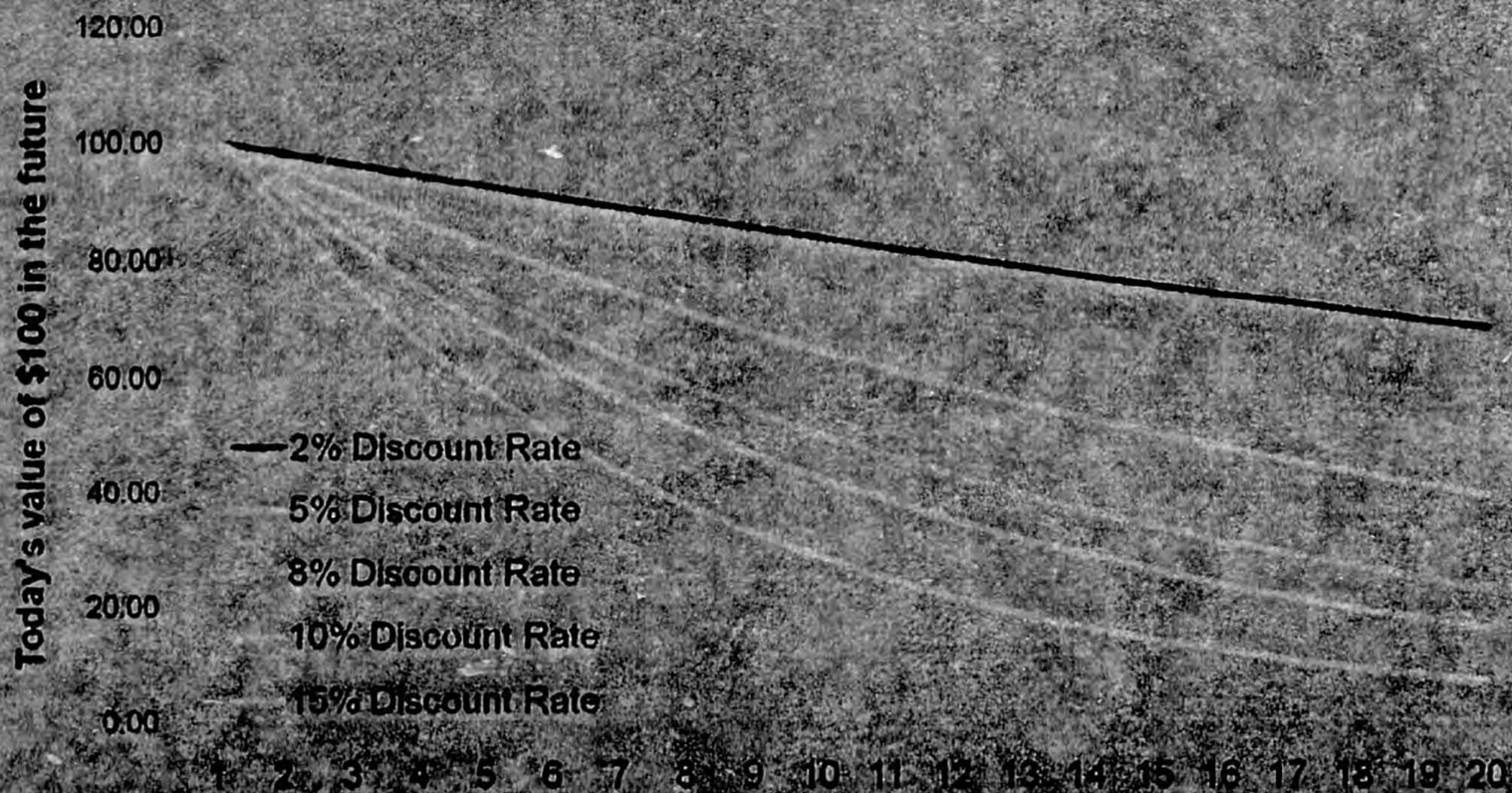
6

Critical Results on Access Delays

1. Up-front investment for seismic acquisition, exploration drilling, and delineation drilling really hurts the economics of oil and gas projects that risk being delayed for many years
2. Every year of delay in access to a gas pipeline after money has already been invested reduces the expected monetary value (EMV) of projects materially

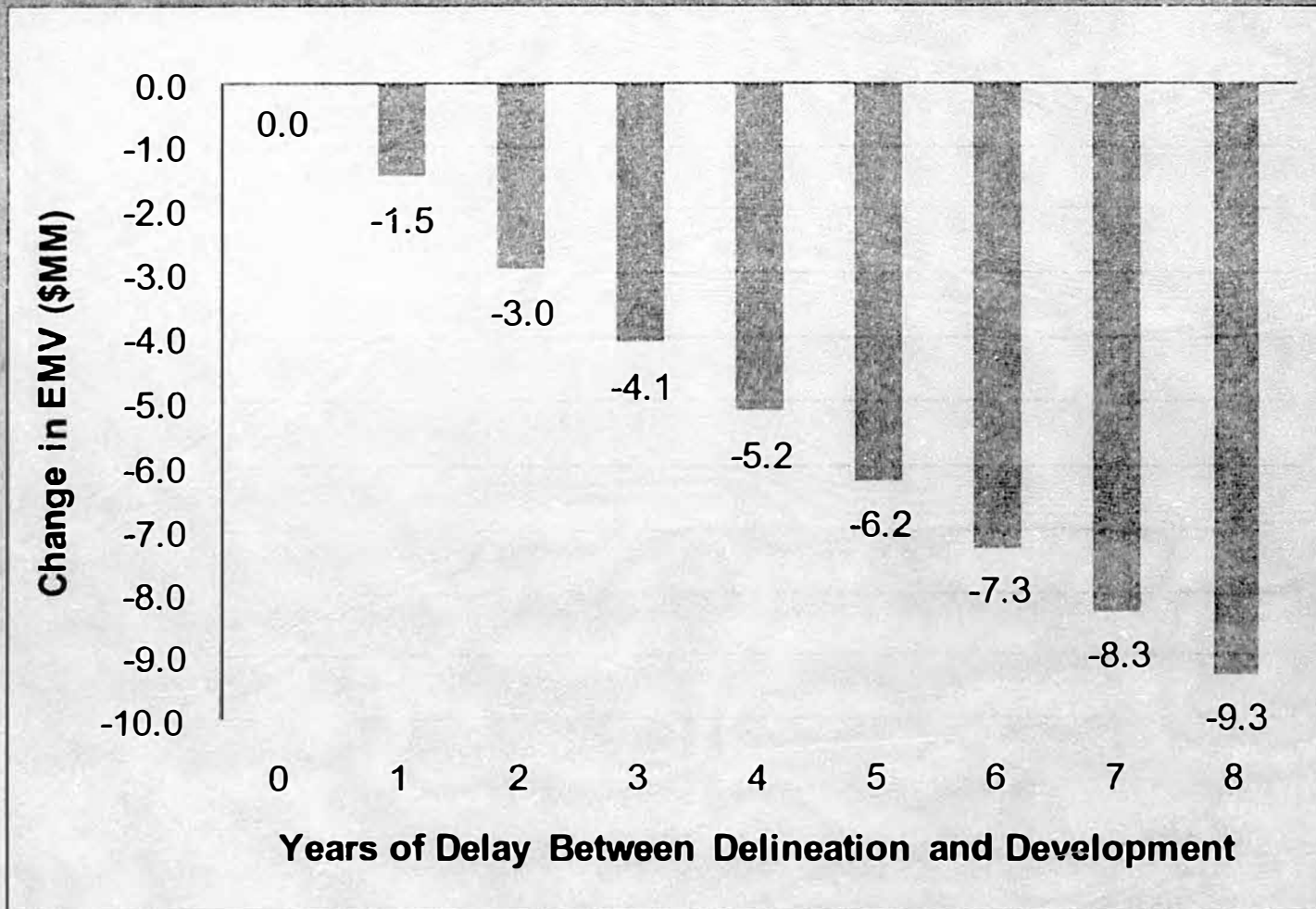
How Discounting Works

Present Value of \$100 Cash Flow in Future Years
Sensitivity to Discount Rate



Prospect Economics*

Effect of Delay: AGIA vs. FERC Open-Season Rules



*Expected monetary value (EMV) of a generic North Slope stand-alone gas prospect

6/12/2008

9

End
(Appendix Follows. For full model details
see AGIA Finding, Appendix L)

The Exploration Model

Base Case Assumptions

1. 10% discount rate for operator (5% for SOA)
2. Land is already leased over attractive prospect
3. Seismic data is already owned over prospect
4. Prospect is sanctioned for exploration drilling
5. 1st exploration well cost = \$38 MM* in Year 1 of the project
6. 2 well delineation program cost = \$25 MM* each in Year 2 and Year 3 of the project
7. Pad and facilities construction begins in Year 4, cost is scaled to production
8. Pipeline construction begins in Year 5, cost is scaled to production
9. Base Case (no delay) = 1st gas sale in Year 8, 6 years after delineation drilling

*Undiscounted expense in today's dollars, before any tax credits or incentives

Defined Variables

1. Gas price = \$8.00/Mcf*
2. OpEx = scaled based on annual production rate

*Fixed value or rate for every year of the model

6/12/2008

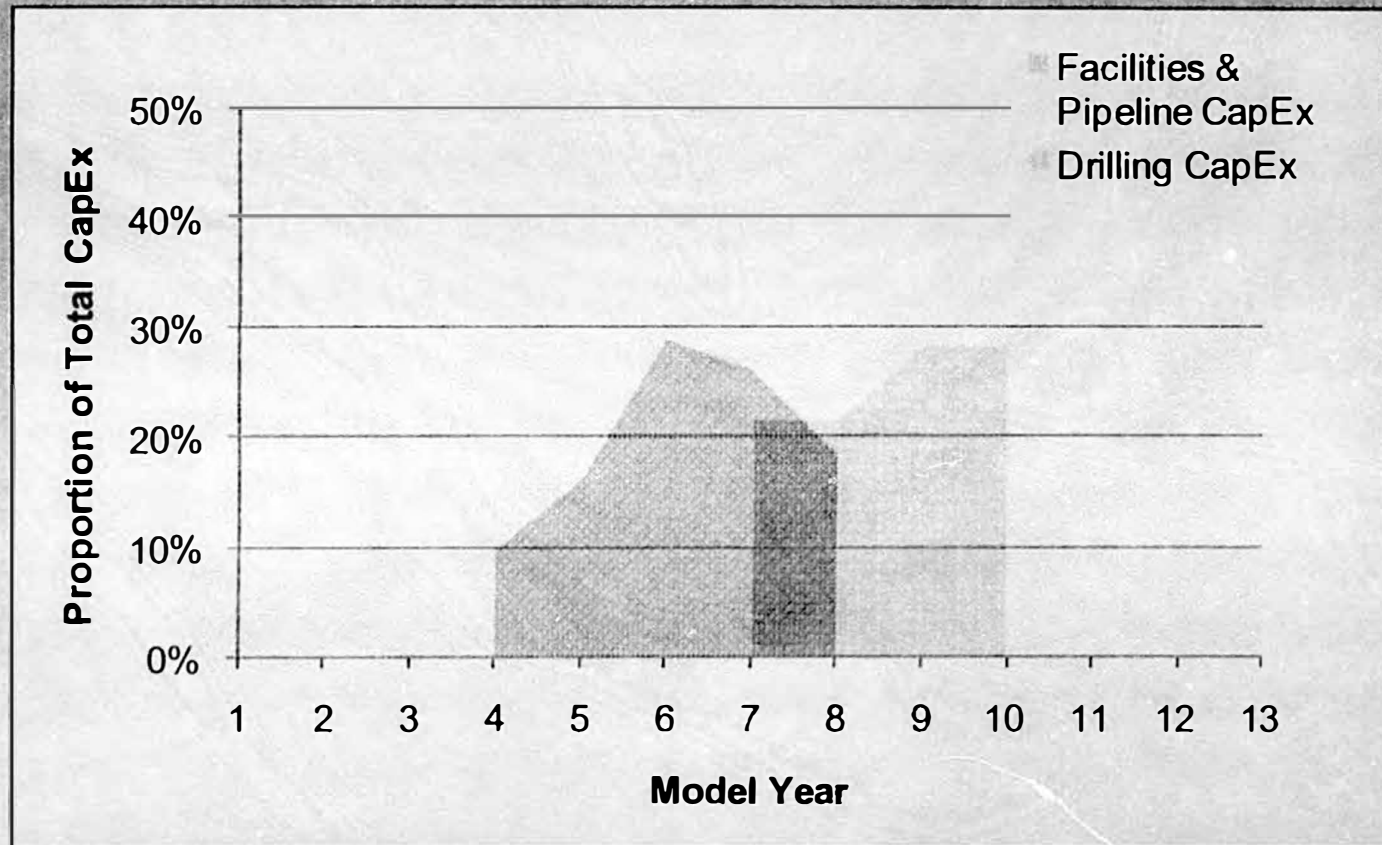
Drilling Success Probabilities

1. 40% = Probability 1st exploration well finds gas (geologic success)
2. 60% = Probability delineation drilling program is success

Development Scenario Probabilities

1. High reserves case = 1,800 BCF (5% probability after delineation)
2. Medium reserves case = 800 BCF (15% probability after delineation)
3. Low reserves case = 400 BCF (75% probability after delineation)
4. Uneconomic reserves case = 80 BCF (5% probability after delineation)

Base Case Expenditure Profiles for Facilities and Drilling



Note: Baseline production is assumed to begin in Year 8 after one year of development drilling.



Infrastructure Improvements Needed to Support Gas Pipeline Construction

Legislative Briefing - June 13, 2008

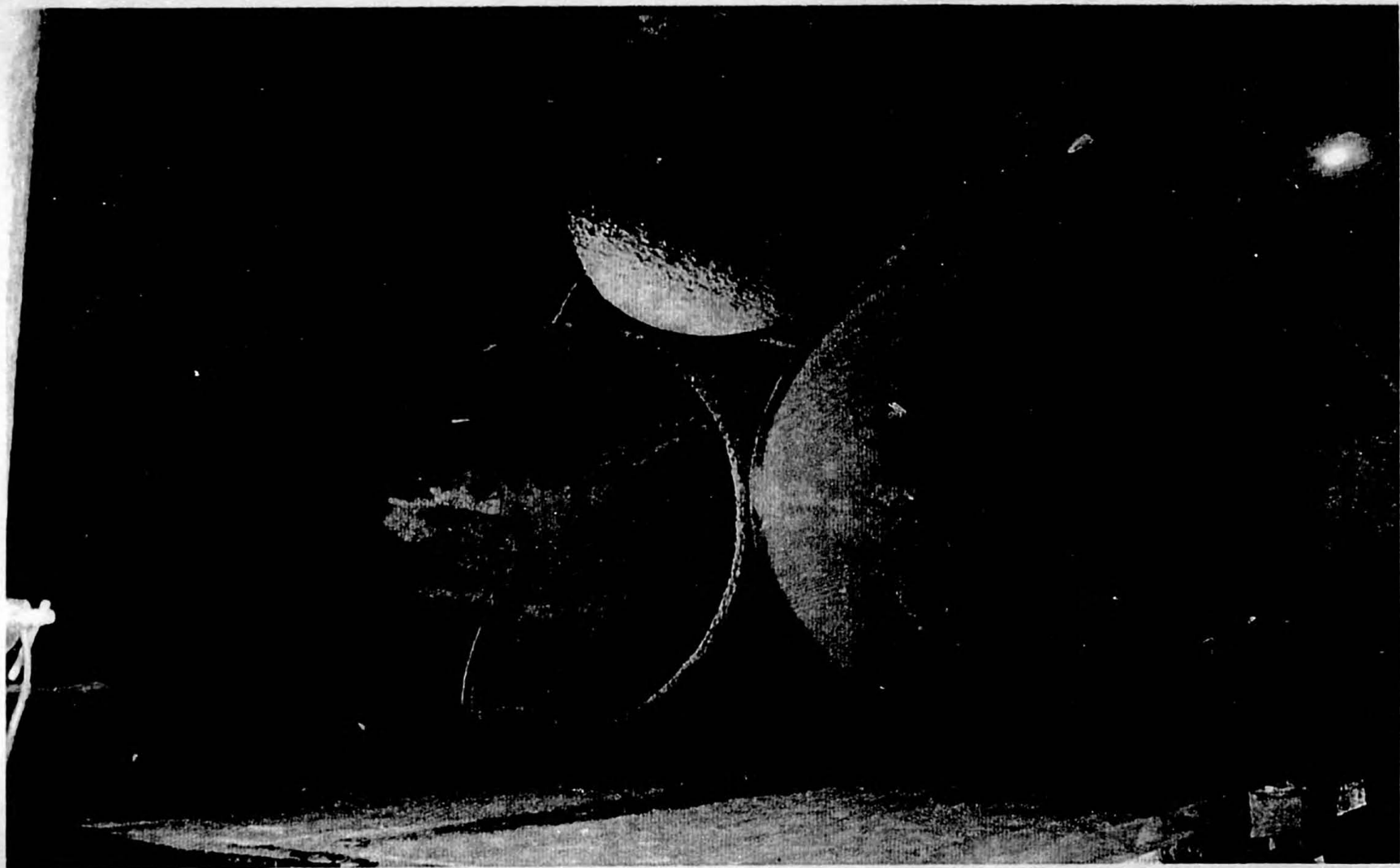
GAS PIPELINE CORRIDOR

Prudhoe Bay To Canadian Border

BASIC TRANSPORTATION ISSUES

▶ Gas pipeline will be different than TAPS

- × Buried construction, more earthwork truck loads
- × Heavier pipe (0.5" v. 1.25")
- × Greater use of large "modules" *(compressor stations)*
- × More ports of entry
- × More air freight traffic
- × Higher background traffic
- × More pavement at risk
- × "Just in time" delivery approach likely



80' sections of pipe
50,000 truck loads
(3600 vehicles)
885,000,000 vehicle trips

WHY NOW?

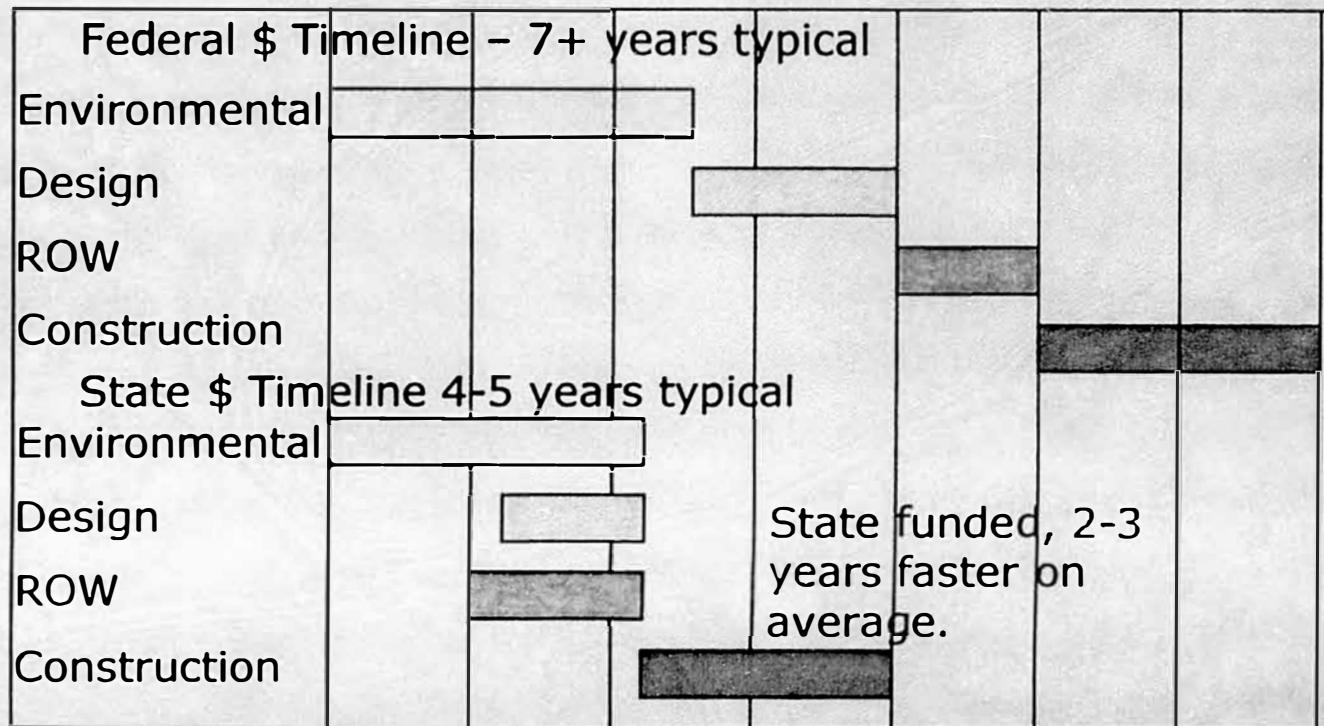
- × Only 6 Construction Seasons (including FY09) Until Gasline Construction
- × Too Much Work to be Compressed into a 2 to 3 Year Construction Window
- × Bad Roads = Slower Gasline Construction and Increased Costs
- × Bid Ready Projects Save Future Inflation as well as Maintenance Costs by Doing Projects Now

WHY NOW? CONTINUED

- × Insufficient Federal Highway Funds and Timeline for Federal Projects
- × Don't Want Roads Under Construction During Gasline Construction
- × Projects will be Training Ground for Trades Needed for Gasline
- × Reduce Accidents / Save Lives

STATE FUNDS ADVANTAGES

Years



KEY CHOKEPOINTS

- ▶ Atigun Pass
- ▶ Yukon River Bridge
- ▶ Fairbanks, North Pole, Delta Junction
- ▶ Alaska Range and Thompson Pass
- ▶ Haines and Haines Highway
- ▶ Anchorage to Wasilla



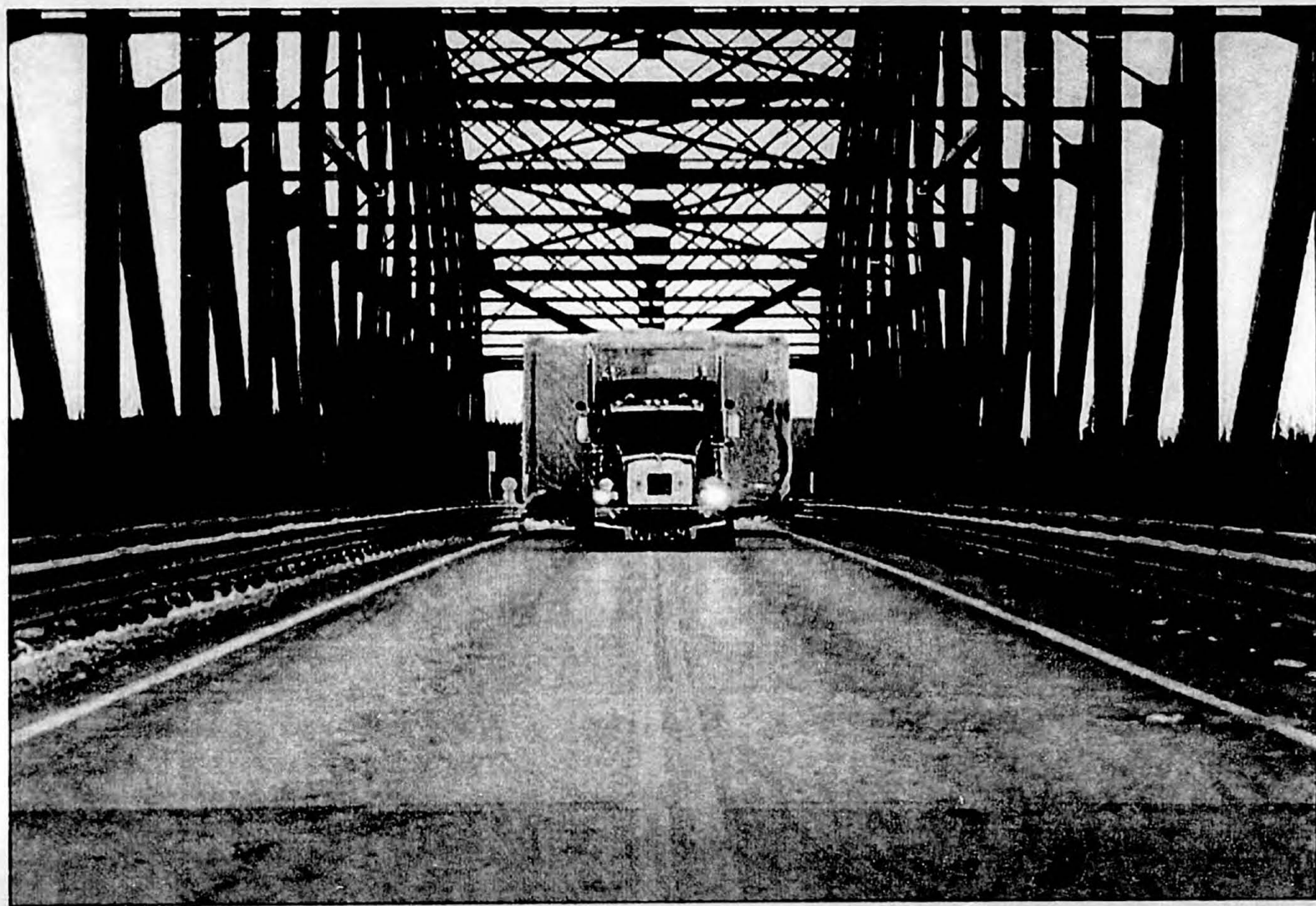
EXAMPLE OF LIMITING BRIDGE GERSTLE RIVER - ALASKA HIGHWAY



Multi-span, with height and width restrictions on module movements. Estimated Cost to Replace >\$50 M

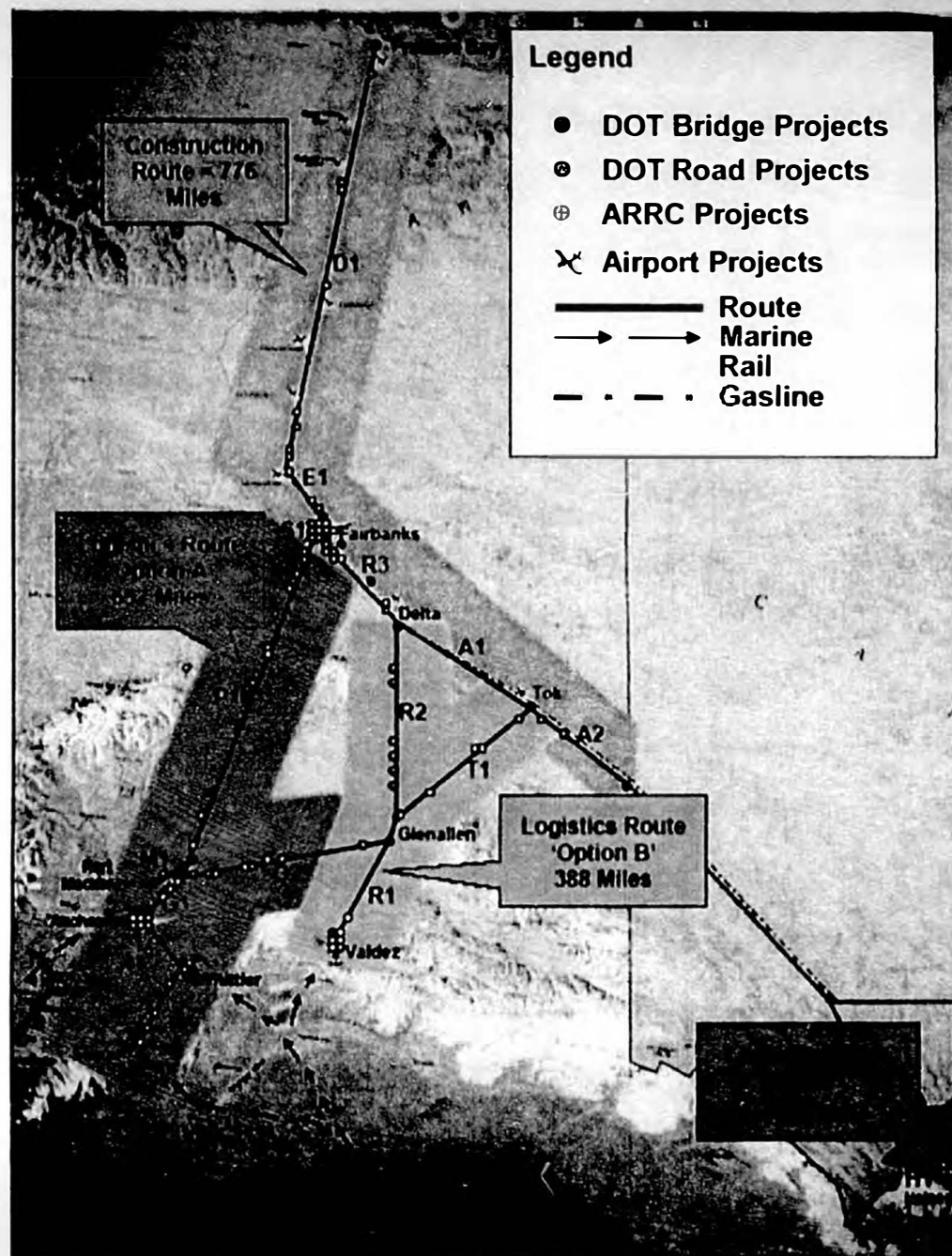
GAS PIPELINE TRANSPORTATION CORRIDOR DESCRIPTION

- × Upgrade Bridges, Highways, Material Sites and Maintenance Camps
- × Improve Safety and Drivability
 - Width
 - Alignment
 - Grades
 - Embankment
 - Surfacing Improvements
- × Improve Maintainability



Transportation Corridors Identified for Ongoing Analysis

ROUTE KEY			
ID	ROUTE	MP START	MP END
A1	Alaska	1422	1315
A2	Alaska	1314	1221
D1	Dalton Hwy	0	415
E1	Elliott	0	68
G1	Glenn Hwy	0	34
G2	Glenn Hwy	35	180
H1	Haines	0	44
K1	Klondike	0	66
M1	Pt. MacKenzie	0	10
P1	Parks Hwy	0	323
PG1	Portage Glacier	0	5
R1	Richardson Hwy	0	117
R2	Richardson Hwy	118	268
R3	Richardson Hwy	269	362
S1	Steese Hwy	0	11
SE1	Seward Hwy	0	78
SE2	Seward Hwy	79	125
T1	Tok Cutoff	0	121



GAS PIPELINE TRANSPORTATION CORRIDOR DESCRIPTION

- × Part 1

- + Dalton/Elliott Highways – Prudhoe Bay to Fairbanks

- × Hub in Fairbanks

- × Part 2

- + Richardson Highway - Fairbanks to Delta

- + Alaska Highway - Delta to Canadian Border

DALTON HWY CORRIDOR COST SUMMARY

- × **Scope:** 36 Projects Along 415-Mile Corridor
 - + 24 Highway projects
 - + 3 Airports
 - + 2 Bridges
 - + 7 Facilities
- × **Schedule:** July 2008 – December 2014
- × **Cost:** \$1.0 Billion – Average \$167 Million a Year for 6 Years
- × **Initial Funding Request:** \$100 Million GF

DALTON HWY CORRIDOR PROJECTS

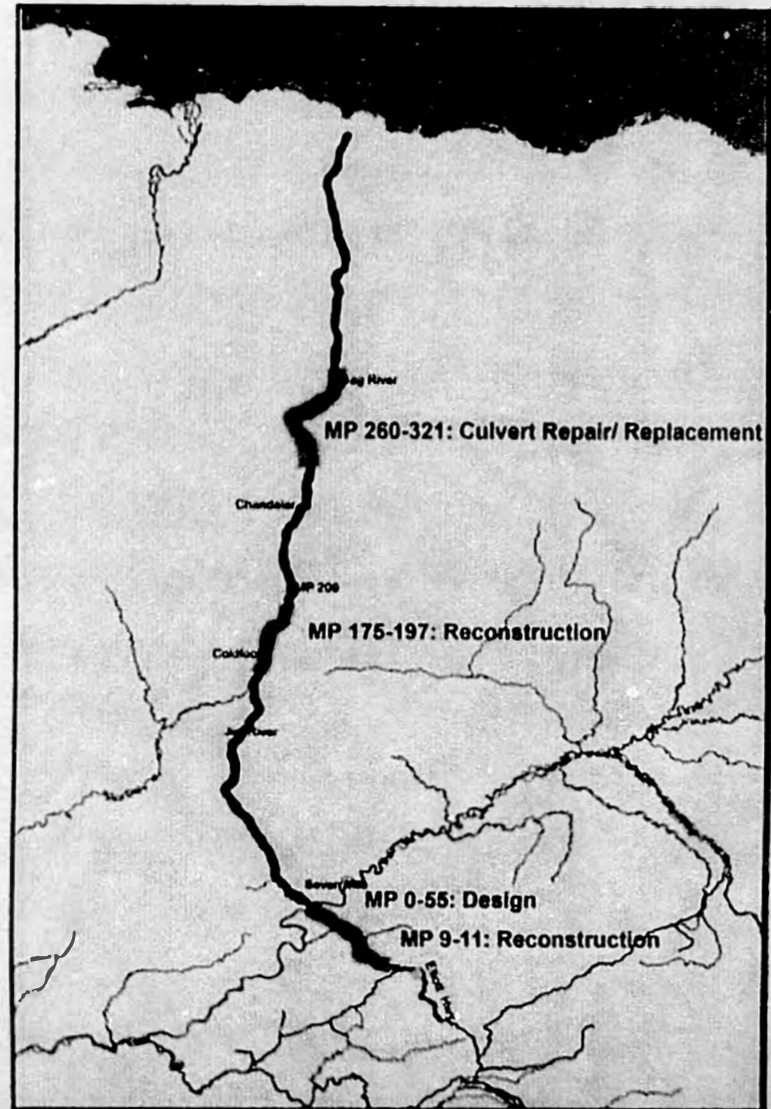
Initial \$100M Request

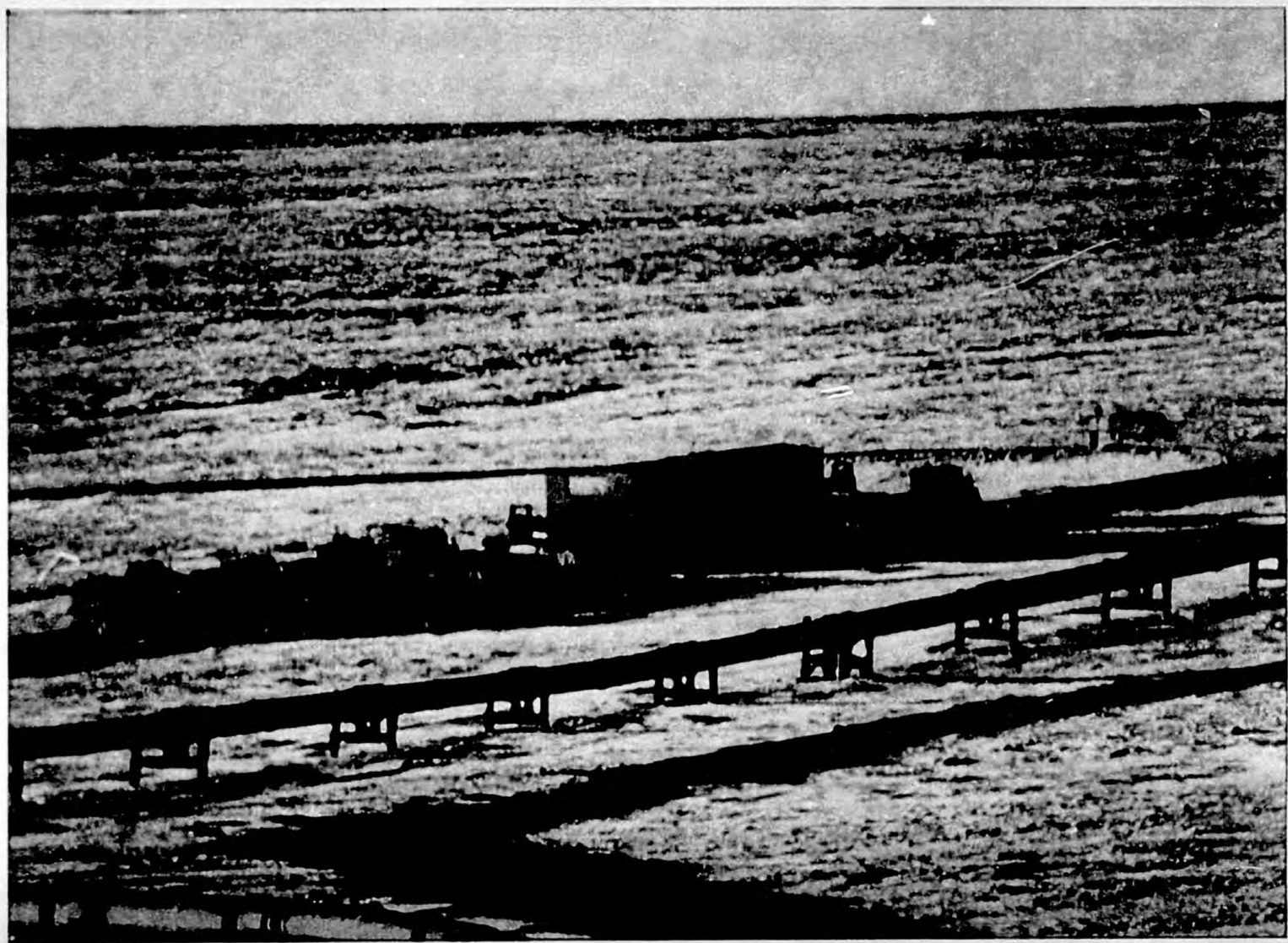
Construction \$75.5M

- Dalton MP 9-11: Reconstruction
- Dalton MP 175-197: Reconstruction Includes Bridge Replacement
- Dalton MP 260-321: Culvert Repairs, Replace with Bridge

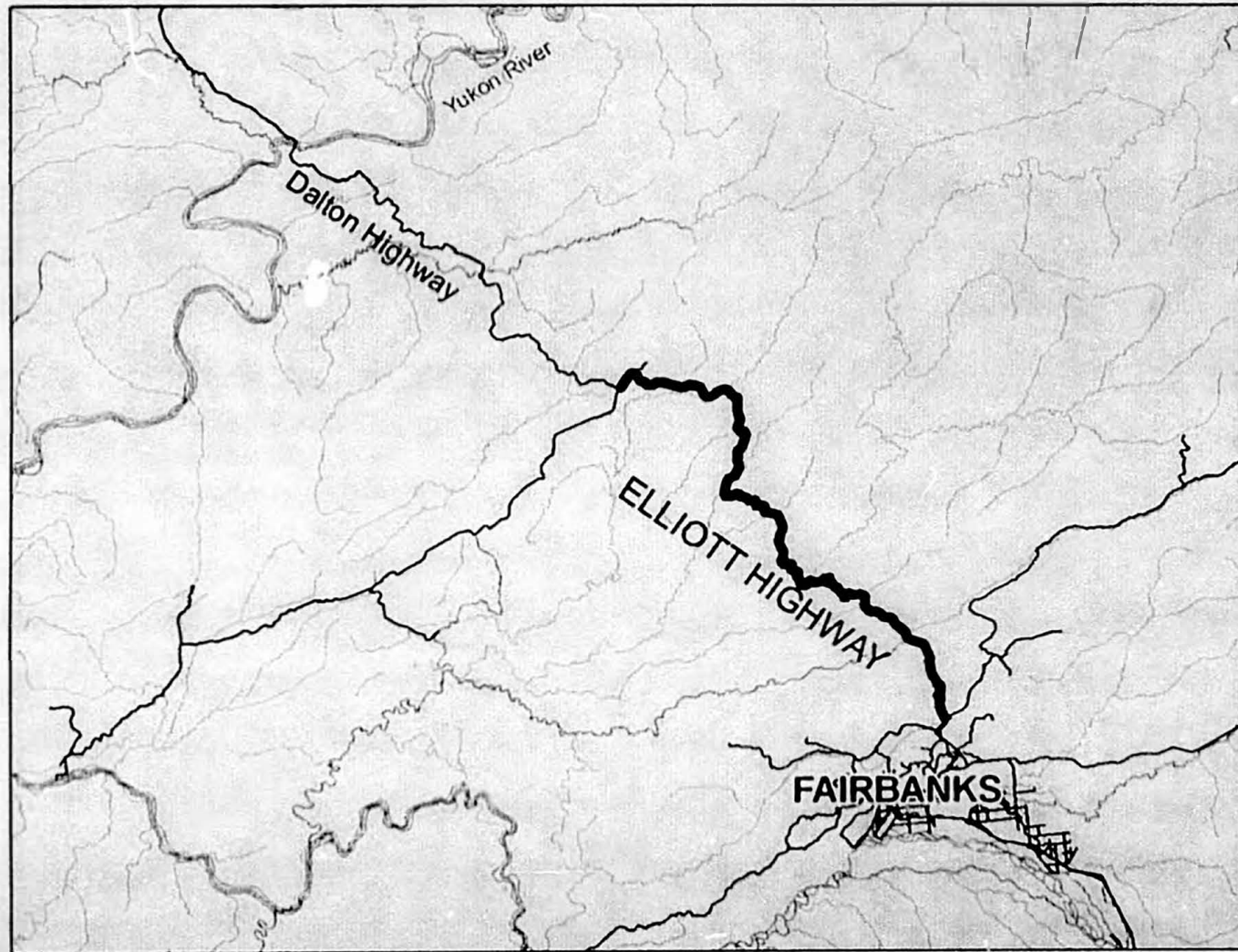
Design \$24.5M

- Dalton MP 0-55: 100% Design
- Material Site Study: Entire Corridor





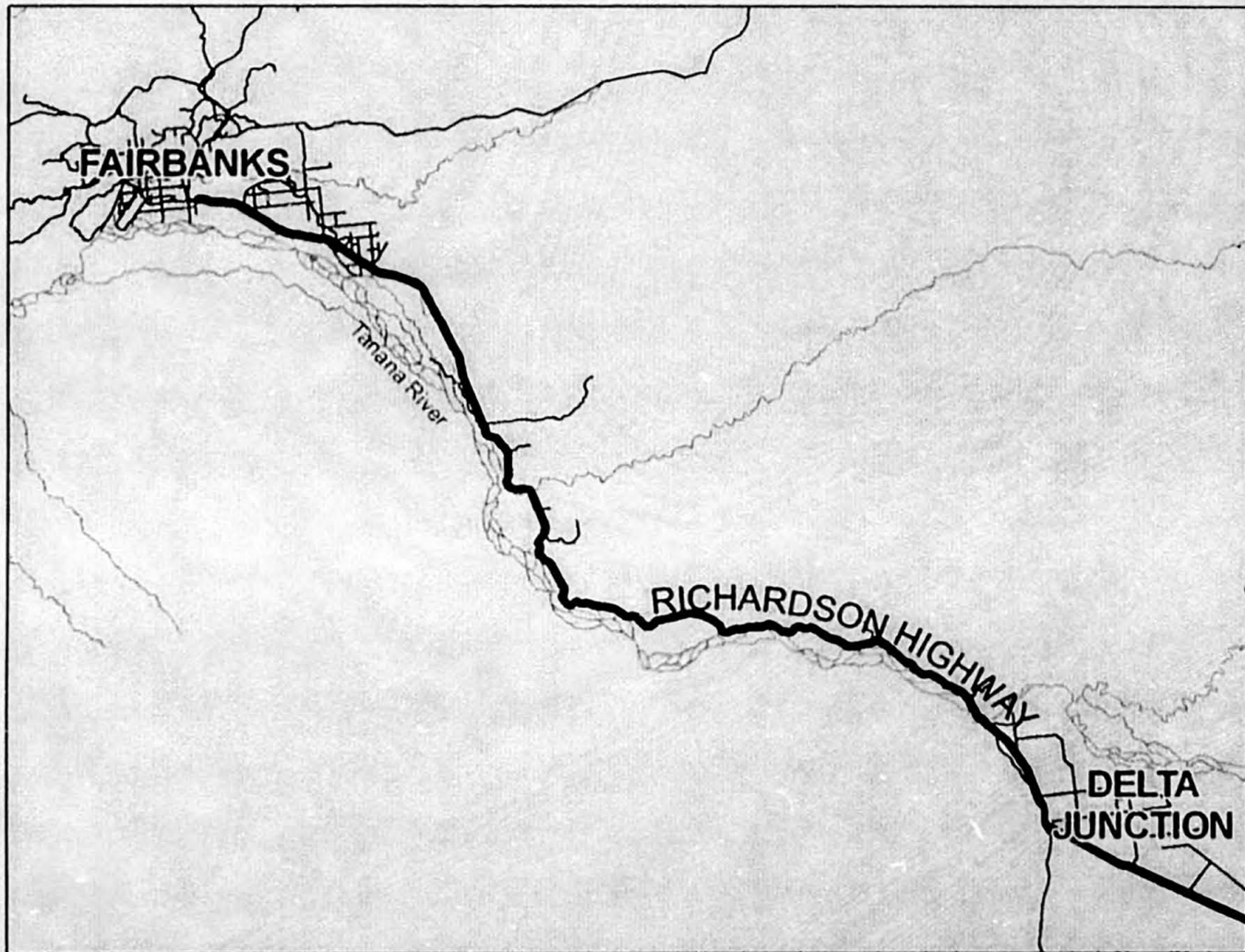
ELLIOTT HWY CORRIDOR



ELLIOTT HWY CORRIDOR COST SUMMARY

- × **Scope:** 6 Projects Along 73-Mile segment
 - + 3 Highway projects
 - + 1 Airport
 - + 1 Bridge
 - + 1 Facility
- × **Schedule:** June 2009 – December 2014
- × **Cost:** \$100 million

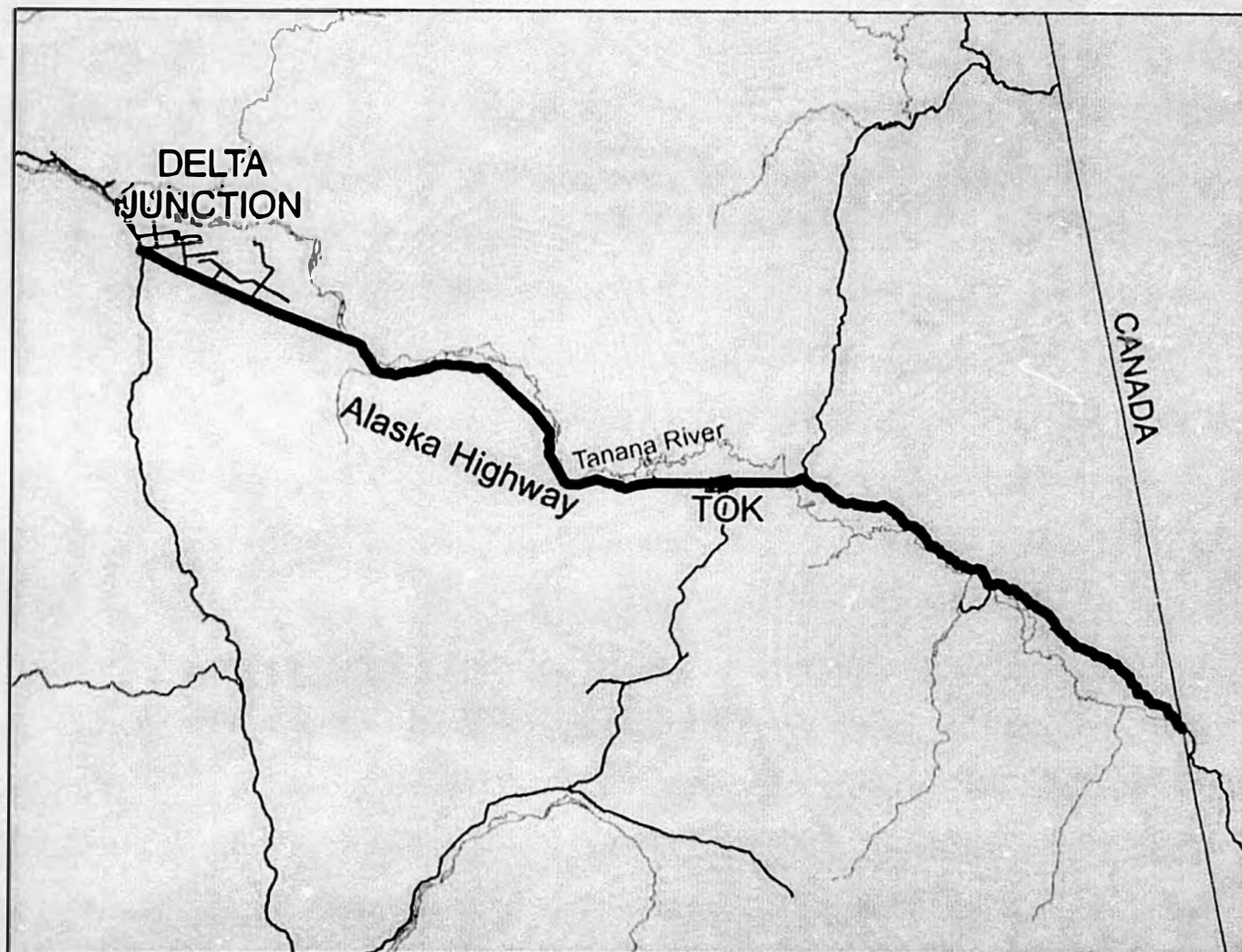
RICHARDSON HWY CORRIDOR



RICHARDSON HWY CORRIDOR COST SUMMARY

- × **Scope:** 21 Projects along 95-mile segment
 - + 15 Highway projects
 - + 2 Bridges
 - + 4 Facilities
- × **Schedule:** June 2009 – December 2014
- × **Cost:** \$300 million

ALASKA HWY CORRIDOR



ALASKA HWY CORRIDOR COST SUMMARY

- × **Scope:** 23 Projects along 200-mile segment
 - + 9 Highway projects
 - + 2 Airports
 - + 9 Bridges
 - + 3 Facilities
- × **Schedule:** June 2009 – December 2014
- × **Cost:** \$600 million

WHY START WITH DALTON HWY CORRIDOR

- × Dalton Hwy is Alaska's major industrial highway
 - × Construction Projects Will be Ready for Bid in Early 2009
 - × Start Design on the Worst Sections, Proceed to Environmental with Goal of Bid Ready in 2010/2011 – Completing Construction in 2014
 - × Material Sites are Depleted in This Corridor; New Sites Need to be Identified, Permitted and Developed

ISSUE OF FINANCIAL RESPONSIBILITY

▶ Who pays?

- + Some road work needed regardless
- + FERC ruled in 1980's pipeline traffic part of ordinary highway use (cannot penalize or treat pipeline differently)
- + Yet, the past tells us pavements will be obliterated!
- + Will FERC see it differently this time?

FINANCIAL RESPONSIBILITY (2)

- ▶ STIP funds 'tapped' out
 - + Funding levels decline in 2009
 - + New earmarks less likely
 - + Urban and other needs are great
 - + STIP \$\$ cannot be diverted to gas pipeline on wholesale basis
- × Status of Shakwak Funds
 - + Will Yukon Roads/Bridges be able to handle construction loads and traffic

FINANCIAL RESPONSIBILITY (3)

- ▶ Financial responsibility issues to be discussed:
 - + Major activity site access such as turn lanes (camps, pipe staging yards)
- ▶ Weigh station bypass technology
 - + May improve state and carriers efficiencies
- ▶ Safety features needed
 - + Truck pull outs to allow passing
 - + Module movements safety pull out areas at bridges
 - + More passing lanes

DOT&PF PROGRESS TO DATE

- × Full time coordinator in place
- × Key work identified (bridges, passing lanes, highway reconstruction)
- × Federal funded projects underway
- × GO bond projects – November election
- × Started Conversations with Prospective Builders

VISIBLE PROGRESS

2007 Elliott Highway: New
Washington Creek Bridge and
realignment

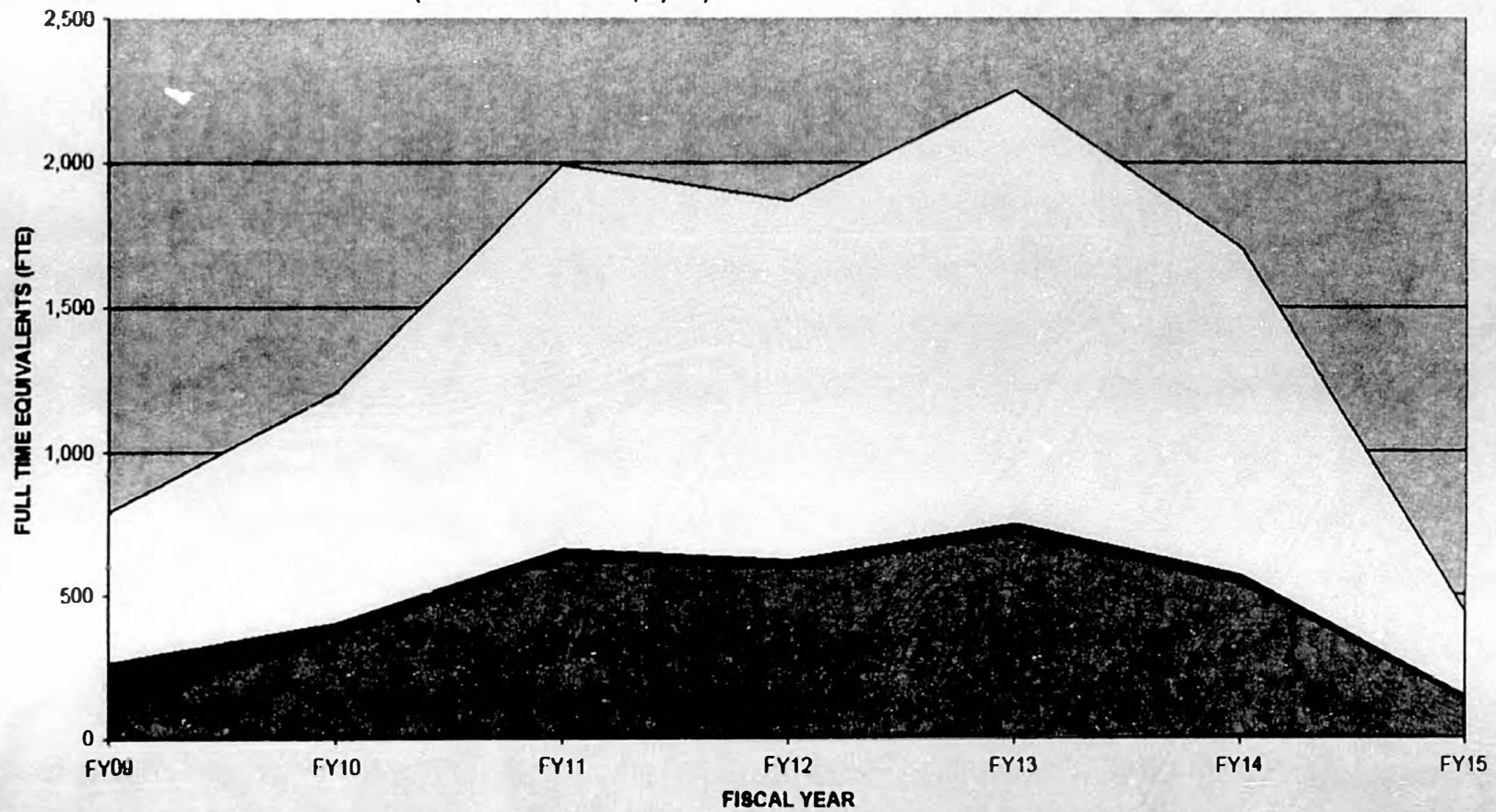


2007 Dalton Highway: Grade
heightening at MP 241 to 242 to
alleviate snow drifting, and aufeis.

NEW JOBS CREATED

DIRECT FTEs & CREATED FTEs
(Dalton & Elliott Corridor projects)

■ DIRECT PRIVATE FTEs ■ DIRECT PUBLIC FTEs □ CREATED FTEs



FTE = Full Time Equivalent; 1.0 FTE = 1 full-time worker

NEXT STEPS

- × Begin work on Dalton Highway - \$100M
- × Evaluate Needs for FY10 Budget
- × Create State Gasline Permit Office
 - Streamline State Permit Process
 - Increase Federal Permitting Efficiencies
- × Establish Apprenticeship Programs
- × Establish MOU w/ Canadian Counterparts

OTHER ISSUES

- ▶ Size and weight issues
- ▶ Extra maintenance and operations support during construction
- ▶ Safety and law enforcement
- ▶ Aviation needs
- ▶ ROW for TC Alaska
- ▶ ROW for Bullet Line
 - ▶ Denali Park and ANILCA
- ▶ Construction Impact on Tourism



QUESTIONS

Contact:

Frank Richards, P.E.

Deputy Commissioner

Alaska DOT&PF

(907) 465-3900

frank.richards@alaska.gov

ALASKA STATE LEGISLATURE

Senator Charlie Huggins, Chair
Senate Special Committee on Energy
State Capitol, Room 119
Juneau, AK 99801
Phone: 465-3878
Fax: 465-3265



Representative John Harris, Chair
House Rules Subcommittee on AGIA
State Capitol, Room 208
Juneau, AK 99801
Phone: 465-4859
Fax: 465-3799

Third Special Session
Twenty-Fifth Legislature

Carlson Center, Fairbanks Alaska

Saturday June 14 2008

10:00-5:00 p.m.

Joint Meeting AGENDA

Presentations: Review of AGIA Findings and Determination; Natural Gas Pipeline Project as proposed by TransCanada Alaska Company, LLC and Foothills Pipelines Ltd. (TC Alaska) to the State of Alaska.

➤ TransCanada's AGIA Application

Tony Palmer, Vice President, Alaska Gas Development

➤ Public Testimony

Testimony – Time Limit May Be Set

Teleconference

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Administration

➤ -AGIA Training Strategic Plan

Clark "Click" Bishop, Commissioner, DOL
Guy Bell, Administrative Services Director, DOL

➤ Employment Modeling

Conrad Mulligan, Senior Scientist for ARCADIS

➤ Infrastructure Needs for an Alaska Gas Pipeline Project

Frank Richards, Deputy Commissioner, DOT

➤ Explorer View

Kevin Banks, Acting Director, Division of Oil & Gas, DNR

Testimony: By Invitation
Teleconference

anne ringstad

w/u of A FOX

~~work~~

456-8336 — cell 978-3322

— 347-2245 Peter Kelly
Lrg Nelson for Univ

== Univ of AK — → 322-0829 Gen Hamilton

450-8000

Wendy (aide to Hamilton) - 450-8007
"Pat Pitney" doing study on engineering

474-7399

— Doug Goering

RE: article on gas pipeline for Alaska Business Monthly

Sen. Charlie Huggins

Sent: Friday, June 13, 2008 10:18 AM

To: LJO Fairbanks

Thank you so much!

body

From: LJO Fairbanks

Sent: Friday, June 13, 2008 10:13 AM

To: Sen. Charlie Huggins

Subject: RE: article on gas pipeline for Alaska Business Monthly

I will take care of that right away...

From: Sen. Charlie Huggins

Sent: Friday, June 13, 2008 10:08 AM

To: LJO Fairbanks

Cc: Sen. Charlie Huggins; Sharon Lutz

Subject: FW: article on gas pipeline for Alaska Business Monthly

Dear Fairbanks:

Could you please let me know if you

for some reason would like to

We sure would appreciate your help.

Thank!

body

by Sharon

Sen. Charlie Huggins

600 East Terminal Avenue

West Anchorage

4000 2nd Ave S, Box 1070, Anchorage, AK 99503

4000 2nd Ave S, Box 1070, Anchorage, AK 99503

From: Billie Fairbanks (mailto:Billie@alaska.com)

Sent: Thursday, June 12, 2008 11:30 AM

To: Sen. Charlie Huggins

Subject: RE: article on gas pipeline for Alaska Business Monthly

Hi, Andy,

Below is a copy of questions I whose answer I would like to include with my article. Any help that

you could be would be appreciated.

Brooks Pielli, Alaska Business Monthly

RE: article on gas pipeline for Alaska Business Monthly

Sen. Charlie Huggins

Sent: Friday, June 13, 2008 10:16 AM

To: LIO Fairbanks

Handwritten: (unclear)

Handwritten: X 07 08/13/08

Thank you so much! ☺

jody

Handwritten: 555-888-1111 - 1234-5678

From: LIO Fairbanks

Sent: Friday, June 13, 2008 10:13 AM

To: Sen. Charlie Huggins

Subject: RE: article on gas pipeline for Alaska Business Monthly

Handwritten: 215-5512

I will take care of that right away...

From: Sen. Charlie Huggins

Sent: Friday, June 13, 2008 10:08 AM

To: LIO Fairbanks

Cc: Sen. Charlie Huggins; Sharon Long; Deborah Grundmann

Subject: FW: article on gas pipeline for Alaska Business Monthly

Dear Fairbanks LIO,

Could you please print off the message below and deliver it to Senator Huggins at the Carlson Center ASAP? For some reason, we are not able to call or fax long distance from our office this morning.

We sure would appreciate your help.

Thanks!

Jody

Jody Simpson

Staff to Senator Charlie Huggins
600 East Railroad Avenue
Wasilla, Alaska 99654
(907) 376-4866 / (907) 373-4724 Fax
Jody_Simpson@legis.state.ak.us

From: PielliofEarth@att.net [mailto:PielliofEarth@att.net]

Sent: Thursday, June 12, 2008 11:30 AM

To: Sen. Charlie Huggins

Subject: RE: article on gas pipeline for Alaska Business Monthly

Hi, Jody,

Below is a copy of questions I whose answers I would like to include with my article. Any help that you could be would be appreciated.

Brooke Pielli, Alaska Business Monthly

3rd Sp. Susan AGIA License -
10 AM June 13, 2008 Fairbanks
Carlson Center

AGIA Training Strategic Plan



Alaska Department of Labor and Workforce Development

Commissioner Click Bishop

Assistant Commissioner Guy Bell

Research & Analysis Chief Brynn Keith

Fairbanks

June 13, 2008

“This gasline will fuel our homes, our economy and careers for Alaskans - for generations.”

Governor Sarah Palin
2008 State of the State Address





Gasline Workforce Goal

Alaskans are trained and ready for a gas pipeline and other natural resource development jobs—and these jobs are made available to Alaskans.



Workforce Development Process

- Identify skills gaps
- Minimize gaps through career awareness, effective labor exchange, job center network, accessible training services



Result: Alaskans meet the needs of Alaska employers for legacy jobs and long term careers.

Training System at a Glance

Postsecondary Education

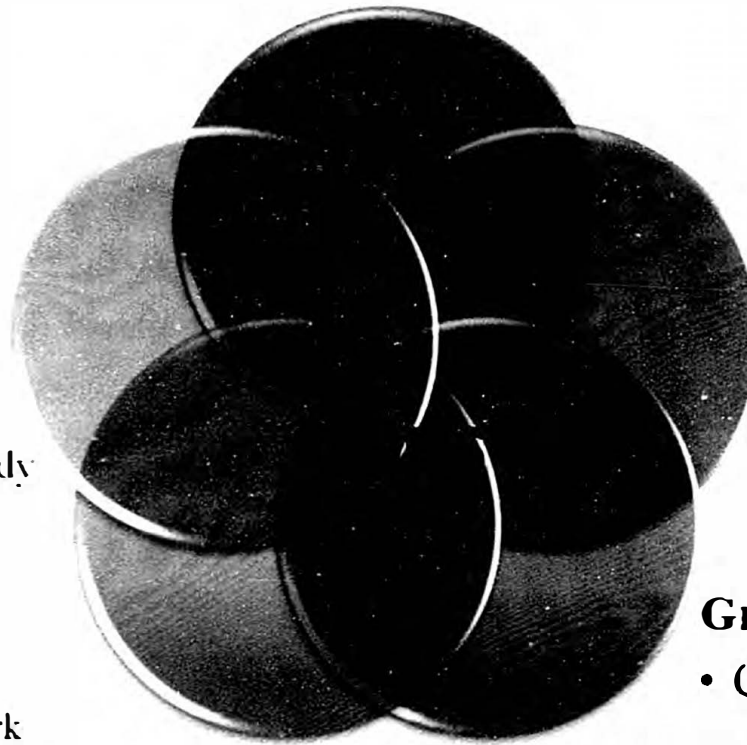
- University of Alaska
- AVTEC
- Regional Training Centers
- Private Training Providers

Secondary Education

- Education & Early Development
- High Schools
- Adult Basic Education
- Youth First
- Construction Academies
- College Ready Work Ready

Employment Services

- Job Center Network
 - Counseling
 - Job/ Training Referral



Funding

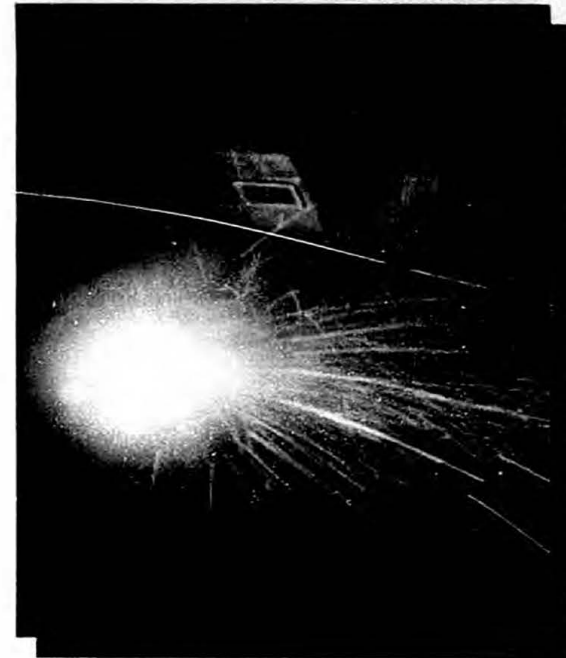
- *Federal*
 - Workforce Investment Act
 - Denali Training
 - Pipeline Training
- *State*
 - STEP
 - TVEP
 - GF
- *Tuition, etc.*

Grantees

- Competitive Selection

Challenges

- Economic cycles
- Ebb and flow of workers
- Awareness—not just professional positions but high paying blue collar jobs
- Cost and accessibility of training
- Job barriers—drug free, driver's license, employability skills, transferrable certification



Four AGIA Strategies

- Increase awareness of and access to careers in natural resource development
- Develop comprehensive career and technical education system
- Increase registered apprenticeships and on-the-job training opportunities
- Increase training for operations, technical and management workers



1. Increase Awareness of and Access to Careers in Natural Resource Development

- Job awareness program
- One stop information on jobs and training
- FY 09 funding to develop training web site and improve online job service



2. Develop Comprehensive Career and Technical Education System

- Career pathways, skill standards and training program coordination
 - FY 09 funding for coordinator
- Work Keys DEED/DOLWD partnership
 - FY 09 funding in DEED
- K-12 career planning and counseling
 - FY 09 Alaska Youth First funded
- Integrated system for youth and adults
 - FY 09 Construction academies funded



3. Increase Registered Apprenticeships and On-the-Job Training Opportunities

- Increase job training for entry level jobs
- Increase apprenticeships in construction
- Employer incentives for apprenticeships and OJT
 - Funding received to support apprenticeships and OJT—targeted federal grant and general fund



4. Increase Training for Operations, Technical and Management Workers

- Expand programs for critical jobs
 - FY 09 funding for UAA engineering program expansion
- Recruit more Alaska high school grads
- Help workers keep pace with technology and skill upgrades
- Expand management training opportunities for skilled workers



Our Focus

- Current skills gap
- Legacy and long-term jobs



Identifying the AGIA Skills Gap

Working with industry partners, DOLWD:

- Identified 113 AGIA occupations
- Used existing occupational supply and demand data to help identify potential gaps



Alaska's AGIA Skills Gap

- Current gap: In 2006 nonresidents accounted for more than 16% of the workers in the AGIA identified occupations
- Future gap: More than 37% of Alaskans working in AGIA occupations were 45 years old or older in 2006





AGIA Occupational Data

	Percent Nonresident Workers (2006)	Percent Workers Age 45+ (2006)	Average Hourly Wage (May 2007)
Carpenters	17.0%	34.6%	\$26.33
Civil Engineers	12.4%	43.9%	\$36.64
Electricians	24.2%	32.7%	\$31.47
Operating Engineers and Other Construction Equipment Operators	18.3%	49.9%	\$28.10
Surveyors	18.1%	45.2%	n/a
Truck Drivers, Heavy and Tractor- Trailer	13.6%	48.8%	\$21.66
Welders, Cutters, Solderers and Brazers	34.8%	40.4%	\$25.05

For More Information

- Web: labor.state.ak.us
- Click on: AGIA Training Strategic Plan



by Admin - presented June 13, 2008 Friday
3rd Sp. Session AGIA License
Carlson Center, FAIRBANKS

CONRAD MULLIGAN, Senior Scientist

ARCADIS

Modeling of Short- and Long-Term Employment
Generated by Construction and Operation of an
Alaska Natural Gas Pipeline Project



ARCADIS

Employment projections generated for ...

- **Construction Phase** of the pipeline and installation of compressor stations, Gas Treatment Plant and LNG facility
- **Operation Phase** of the pipeline and related facilities (compressor stations, GTP and LNG plants)
- **Exploration and Development** work on the North Slope spurred by operation of natural gas pipeline



ARCADIS

Handwritten notes at the top left of the page, including the word "Budget" and some numbers.

ARCADIS

Sources of Data/Model Used

- Sources of Data
 - Cost data from TC Alaska AGIA Application and other information provided to the State
 - Data generated by State's consultants
 - Information from Division of Oil and Gas
- Model Used
 - IMPLAN
 - Cost-driven
 - Uses Alaska-specific labor factors



ARCADIS

Construction Phase Assumptions

- Gas Treatment Plant and LNG facility will be built Outside
- Major equipment and materials purchased Outside
- Labor force in Valdez constrained by size of camp



ARCADIS

Construction Phase Employment Results

- Any natural gas pipeline project will create thousands of short-term construction jobs
- Largest number of construction jobs will be available during a brief peak period
- LNG option
 - 16 000 jobs in peak year
 - Longer peak period due to LNG installation
- TC Alaska/Producer Pipeline
 - 15 000 jobs in peak year



 ARCADIS

Operations Phase Employment Results

- TC Alaska or Producer Pipeline: ~200 operations jobs in Alaska
- LNG option: ~600 operations jobs in Alaska
 - ~200 jobs on the pipeline and at GTP
 - ~400 jobs at LNG plant in Prince William Sound



 ARCADIS

E&D Employment: Scenario Development

- FERC regulations mandate an open access pipeline
- 'Effective Open Access' is different from FERC-mandated open access



ARCADIS

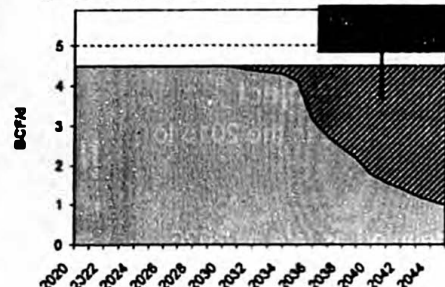
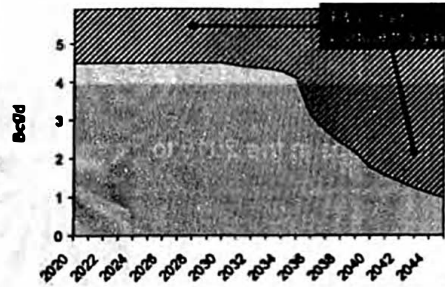
E&D Employment: Scenario Development

- 'Effective Open Access' pipeline system
 - Reasonable transportation rates
 - Timely voluntary expansions
- 'Non-Effective Open Access' pipeline system
 - Higher transportation rates
 - Does not offer voluntary expansion
 - May contain components (e.g. an LNG facility) that is not required to operate on an open access basis



ARCADIS

E&D Employment: Scenarios



ARCADIS

• TC Alaska Scenario

- Offers 'Effective Open Access'
- Capacity expansions as demanded + Reasonable tariffs = Favorable explorer economics = Aggressive E&D activity

• 'Non-Effective Open Access' Scenario

- No capacity expansion
- No new natural gas production (or E&D work) until current fields fall off plateau

E&D Employment: Assumptions

- New production facilities will be constructed in Alaska
- New natural gas fields will be brought on-line to keep the pipeline full at a given assumed capacity
 - 5.9 bcf/d for TC Alaska Scenario
 - 4.5 bcf/d for Non-Open Access Pipeline Scenario



ARCADIS

Results: E&D Employment

- TC Alaska
 - Approximately **72,000** E&D jobs in the 2015 to 2045 timeframe
 - Jobs may be created as early as 2015
- Non-Effective Open Access Project
 - Approximately **47,000** E&D jobs in the 2015 to 2045 timeframe
 - Job creation may be delayed as late as 2026

 ARCADIS

Results: E&D Employment

- Timing of E&D job creation is a function of a pipeline's characteristics
 - Effective Open Access = Jobs Sooner
 - Non-Effective Open Access = Job Creation Delay
- Creating new natural gas basin-related jobs sooner is important ...
 - Offset job losses likely to occur as existing oil fields decline
 - Maintain existing skill sets and talent pool in Alaska

 ARCADIS

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AGIA
Written Findings and Determination

PREFACE

This document contains the Findings and Determination of the Commissioners of Natural Resources and Revenue concerning whether to issue a license under the Alaska Gasline Inducement Act ("AGIA") to TransCanada Alaska Company, LLC and Foothills Pipe Lines Ltd. Throughout this document, the AGIA applicant is referred to as "TC Alaska." TC Alaska is a subsidiary of TransCanada Corporation ("TransCanada"). TransCanada, through its independent pipeline company affiliates, owns and operates one of the largest natural gas pipeline transportation networks in North America. TransCanada has pledged all support necessary, both financial and otherwise, to TC Alaska to achieve completion of the project.

The basis for this Determination is explained in detail in the written Findings and supporting documentation that follows:

- *Executive Summary:* The Executive Summary contains a short, simple discussion to provide the reader with a sketch of the more important aspects of the Findings document. The reader can obtain additional, more-detailed information from the actual text of the Findings and Determination.
- *Chapter One — Introduction and AGIA:* Chapter One serves as an introduction to the process used to develop this Findings document and presents information that guides the reader through the evaluation conducted by the Commissioners of the Departments of Natural Resources and Revenue under AGIA. Chapter One also presents information on how the commissioners examined and compared three natural gas projects in order to determine the type of project that most sufficiently maximizes benefits to Alaskans.
- *Chapter Two — Technical Background:* Chapter Two provides a simplified explanation of the many components of a major natural gas pipeline project—what physical and engineering components comprise a natural gas pipeline, what regulatory processes govern the development and operation of a pipeline, what commercial factors drive the economics for the various pipeline stakeholders, and what methods are traditionally used to evaluate a pipeline project's technical and commercial viability.
- *Chapter Three — Analysis of TC Alaska's Application:* Chapter Three contains the commissioners' evaluation of the TC Alaska Project as proposed in its AGIA Application.
- *Chapter Four — LNG:* Chapter Four contains the commissioners' comparison of the TC Alaska Project with liquefied natural gas (LNG) project options.
- *Chapter Five — Producer Project:* Chapter Five consists of the commissioners' comparison of the TC Alaska Project with the proposal ConocoPhillips and BP recently submitted, labeled "Denali™ - the Alaska Gas Pipeline" ("the Producer Project").
- *Chapter Six — Findings and Determination:* Chapter Six contains the Findings and Determination of the commissioners.
- *Appendices:* The appendices contain information that supplements or further explains the Findings document. The appendices include the summary of public comments and the responses to those comments, as well as expert reports.

EXECUTIVE SUMMARY

This Executive Summary contains a short, simple discussion of the more important aspects of the Findings document. The reader can obtain additional, more detailed information from the actual text of the Findings and Determination. As discussed in these Findings:

- *Issuance of the AGIA license to TC Alaska will maximize benefits to Alaskans because it will provide the best opportunity to achieve a gas pipeline that encourages full exploration of Alaska's natural gas resources, generates long-term jobs for Alaskans, maximizes state revenues, provides affordable in-state gas opportunities, and realizes other important state goals.*
- *Although liquefied natural gas ("LNG") project options are likely economic, they would provide the state with less revenue than the TC Alaska Project. Exclusive LNG projects are significantly less likely to succeed compared to TC Alaska because they are more complex, more costly, more difficult to finance, and would face potential regulatory barriers in exporting LNG to Asia. The TC Alaska Project provides Alaska with its best opportunity for a successful LNG project, as a "Y-line" option. The TC Alaska Project proceeding first will reduce costs and lessen financial and contracting hurdles associated with an LNG project. Coming after gas is already bound for U.S. markets, a Y-line may be able to overcome political opposition to exporting gas. Accordingly, the commissioners believe that the best route to an Alaska LNG project runs through the TC Alaska proposal.*
- *Although the TC Alaska Project would generate billions of dollars of profits for the Major North Slope Producers, BP and ConocoPhillips have opposed the TC Alaska Project and touted their own pipeline proposal ("the Producer Project"). Unlike TC Alaska's Project, the Producer Project contains no commitments to a project timeline, fails (similar to TAPS) to ensure tariff and expansion terms that will maximize North Slope exploration and development, suffers from potential antitrust problems, and in order to result in a pipeline will likely (similar to the failed Stranded Gas Development Act contract) require the state to provide the Producers with massive additional fiscal concessions.*

Purpose of this Finding and Determination

AGIA, AS 43.90, requires the Commissioners of Natural Resources and Revenue to issue a determination with written findings if they decide that a proposed gasline project will sufficiently maximize the benefits to the people of Alaska and merits issuance of an AGIA license. This document constitutes the commissioners' Finding and Determination. Following an extensive evaluation process and consideration of public comments, the commissioners have determined that the TC Alaska Project will sufficiently maximize the benefits to Alaskans and merits issuance of the AGIA license.

Benefits for Alaska of a TC Alaska Gas Pipeline Project

The pipeline project proposed by TC Alaska offers significant benefits to Alaska. Alaska's economy will benefit from short-term construction jobs, but will benefit more significantly from long-term careers, as new natural gas fields are developed because the pipeline to market has been built. Alaska will benefit from a pipeline that can be expanded to accommodate additional natural gas supplies that can be dedicated to meet Alaska's energy needs. Alaska will benefit from a pipeline tariff structure that maximizes state revenues, provides true open access to all potential shippers, provides the lowest reasonable transportation rates, and accommodates expansions. Alaskans will benefit from the opportunity the TC Alaska Project creates for a "Y line" liquefied natural gas project and the "bullet line" to Southcentral Alaska. Alaska will benefit from the potential for lower energy costs as natural gas is made available to communities throughout Alaska via off-take points along the pipeline route and associated spur lines. The construction of a natural gas pipeline is an exciting start to a new era in the Alaska economy, one where more Alaskans have careers in natural gas exploration and development, where the state and its citizens enjoy a continuing stream of tax and royalty revenues, and where local energy costs are reduced.

Because of the commitments to expansion and real open access that will open the North Slope basin to competition, the TC Alaska Project will generate long-term jobs more effectively than either an LNG option or the Producer Project.

Constructing a natural gas pipeline will generate thousands of construction jobs that will last for three to four years. After the pipeline is operating, employees will be needed to operate compressor stations and other pipeline facilities. The demand for skilled workers trained to drill wells and build new production facilities will increase as the availability of a path to market enhances the economics of exploring for Alaska's vast undiscovered gas resources. Because of its commitments to expansion and real open access that will open the North Slope basin to competition, the TC Alaska Project will generate long-term jobs more effectively than either an LNG option or the Producer Project.

The TC Alaska Project will not interfere with a smaller "bullet line" from the North Slope to Southcentral Alaska. Rather, moving both projects forward simultaneously may produce unique synergies. There are adequate amounts of natural gas on the entire North Slope to fill both pipelines. Because of its smaller scale, the "bullet line" project may be designed and

constructed more quickly than the TC Alaska Project. The two projects may provide benefits to each other: the construction work force may gain experience working on the "bullet line;" and the TC Alaska Project may attract experts to the state who would not otherwise be available to work on the "bullet line" project.

The TC Alaska Project would not preclude an LNG project. Indeed, approving the TC Alaska Project will enhance the prospects for a successful "Y line" LNG project as it will reduce the costs, financing challenges, and commercial coordination challenges unique to LNG projects. TC Alaska offers to construct or transport gas to a "Y line" from Delta Junction to an LNG processing facility in Prince William Sound if shippers express sufficient demand for that project as the work on the overland project progresses.

The TC Alaska Project provides several opportunities to address Alaska's need for low-cost energy. TC Alaska's proposed distance-sensitive transportation rates ensure that Alaskans will pay just the costs incurred to ship gas within Alaska. The TC Alaska Project also offers the potential for construction of spur lines that will make natural gas available to communities throughout the state. Most importantly, because the true open access and tariff provisions promote gas exploration and development, Alaskans will benefit from an environment in which companies compete to meet Alaskans' energy needs.

The cost of transportation on the TC Alaska pipeline (its "tariff") will protect the state's interests throughout the years of pipeline operation. Lowest reasonable tariffs are essential to ensure genuine open access and maximize opportunities for development of Alaska's North Slope natural gas resources. TC Alaska commits to the requirements of AGIA that are designed to ensure the lowest possible tariffs. When tariffs are too high, explorers and developers are discouraged from investing in North Slope natural gas exploration and development. Low tariffs improve the economics of finding and developing additional natural gas resources on the North Slope, which encourages additional exploration and development work that will provide for long-term, stable employment for Alaskans.

Low Tariffs

- Encourage exploration
- Increase long-term employment opportunities
- Produce higher revenues to the state
- Strengthen the Permanent Fund

Low tariffs also mean that the state can earn a greater return on its natural gas resources. As the owner of the natural gas resources, the state gets a share of the natural gas production, its "royalty" share. As a sovereign, the state taxes the profit on natural gas production. Tariffs are

deducted from the market price at the destination where the natural gas is delivered before the royalty amount and production taxes are calculated. This means the higher the tariff, the lower the return to Alaska for its natural gas resource. These returns are an important future revenue stream for the state that can be used to fund government services and capital projects, defray the cost of energy to Alaskans, and maintain the strength of and protect the Permanent Fund.

TC Alaska has committed to regularly expand its pipeline to meet the need for transporting additional gas on reasonable commercial terms. This is essential to opening the North Slope to competitive natural gas exploration and development. New explorers and producers need confidence that if their efforts are successful, they will be able to get their natural gas into the pipeline and to market at a fair rate for transportation.

Alaska's experience with TAPS (which is owned by the Major North Slope Producers) demonstrates how the terms of ownership and operation of a pipeline can adversely affect the state's economic interests and the exploration efforts of developers who do not own a share of the pipeline. When the Regulatory Commission of Alaska reviewed the tariffs on the TransAlaska oil pipeline twenty-six years after it began to operate, it found that the tariffs were excessive. The Superior Court, and eventually the Alaska Supreme Court, affirmed the Commission's finding that the TAPS owners had collected pipeline tariffs from shippers that were an average of 57 percent too high. Decades of excessive tariffs reduced the state's royalties and production tax, and hindered competitive development of the state's oil resources by non-owner companies.

Alaska cannot afford to repeat the TAPS experience. The state must maximize development of the natural gas resources on the North Slope to realize economic growth through increased jobs, revenues, and other benefits that will flow from increasing gas production. TC Alaska's commitments to a lower tariff structure will ensure that the state does not repeat the problems experienced with TAPS.

The commissioners recognize the Producer Project may be pursued to completion outside the AGIA process and without state fiscal concessions. The Producers have an obligation to market their gas when it is reasonably profitable to do so; they do not have an obligation to transport the gas through any particular project. If the Producer Project proceeds to an open season, the TC Alaska Project would compete with the Producer Project for gas commitments. However, the Producers have stated that they need concessions from the state to enable them to commit gas to any gas pipeline project. AGIA ties upstream incentives to gas committed at the initial

open season of the AGIA project, to provide the state with the benefits Alaskans require. The state will have opportunities throughout this process to evaluate the need to increase the value of the AGIA upstream incentives, when justified.

The TC Alaska Project offers significant benefits to the state and its citizens. As a pipeline company which increases its profits by expanding its system, TC Alaska has the incentive to foster timely development of the state's natural gas resources to their maximum potential. This also serves the state interests. The TC Alaska Project sets the stage for an open and competitive North Slope natural gas basin during and after pipeline construction. TC Alaska is unique in its willingness to commit to actions that will realize this future.

Awarding a license to TC Alaska will ensure that any additional upstream incentives are provided in exchange for the benefits inherent in an AGIA project. In addition, awarding a license to TC Alaska reduces the likelihood that the state will need to provide unwarranted concessions to the Major North Slope Producers.

Background

Development of Alaska's natural resources is the cornerstone of Alaska's economy. Alaska's North Slope is a world-class natural gas basin. Recent studies estimate that there are 224 trillion cubic feet ("Tcf") of undiscovered, technically recoverable natural gas resources throughout the Alaskan Arctic. Of this amount, 137 Tcf are categorized as undiscovered, economically recoverable resources. These resources are in addition to the approximately 24.5 Tcf of natural gas reserves within Prudhoe Bay plus 9 Tcf of natural gas reserves discovered in other existing fields on the North Slope, including Point Thomson. Although there has been considerable debate about who should build a pipeline and when it will be built, there is unanimous agreement that Alaska needs a pipeline to get its huge volumes of natural gas to market.

When natural gas was discovered on the North Slope, the search began for a way to get Alaska's substantial natural gas resources to market. State and federal laws were passed to encourage natural gas pipeline construction. Potential developers spent millions of dollars on plans and studies. However, the low prices in natural gas markets forestalled the commitments necessary to support the tremendous cost of what would be the largest construction project in North America. As dynamic changes occurred in the natural gas market within the last decade, the viability of, and interest in, an Alaska natural gas pipeline increased.

In 1998, when the Stranded Gas Development Act ("SGDA") was passed, the average price for natural gas in the Lower 48 was under \$2 per million British thermal unit (mmbtu). The first half of this decade was marked by discussions of what type and amount of government subsidies and concessions were needed to make the project viable. Within Alaska, those discussions came in the context of contract negotiations conducted by the previous Governor and his administration with the three primary oil and gas leaseholders on the North Slope: BP, ConocoPhillips, and ExxonMobil ("Major North Slope Producers"). The debate surrounding the proposed contract centered on how much value the state would need to transfer to the Major North Slope Producers and how much risk the state would be required to accept.

By 2006, the natural gas markets had changed dramatically. The average price of natural gas in the Lower 48 was more than \$6 per mmbtu. Large government subsidies no longer appeared necessary to make the project economically viable. In addition, the state had become much better educated on natural gas pipeline economics. The State learned that if it was not careful to protect its interests, billions of dollars in value could be transferred unnecessarily from the state to the Major North Slope Producers. These changes shifted the public debate from what state concessions would be necessary to what the state government could do to most effectively advance the project and maximize the interests of Alaskans. The legislature did not accept the contract that had been negotiated with the Major North Slope Producers under the SGDA. The Major North Slope Producers continued to insist that large concessions from the state were needed, without demonstrating the need for those concessions. Alaska's natural gas pipeline project was at an impasse.

When the Palin Administration proposed AGIA in early 2007, it was based on the understanding that an Alaska natural gas pipeline project was economically viable and that the Major North Slope Producers would continue their efforts to negotiate commercial terms to maximize their strategic position in Alaska and obtain maximum value from any natural gas pipeline project. To protect the state's interests, AGIA used free market competition to move the project through the current impasse. All interested companies were eligible to propose any type of project they determined to be economically and technically viable. The Major North Slope Producers would need to decide whether they were going to get the enormous reserves of Alaska natural gas in the fields they now operated to market in a pipeline they built and owned, or one constructed by

AGIA uses free market competition to move the project through the current impasse. All interested companies were eligible to propose any type of project they determined to be economically and technically viable.

a third party. AGIA presumed that the Major North Slope Producers would act as reasonable commercial players who would comply with their lease obligations and participate in a project with positive economics. Furthermore, AGIA established that if incentives are provided to a natural gas pipeline project they are given in exchange for genuine open access and other provisions necessary to protect the state's interests.

AGIA established a competitive process to allow companies to compete for a license. The companies submitting applications to construct and operate Alaska's natural gas pipeline were required to commit to the tariff and expansion terms that were designed to protect the state's interests and to develop the state's economy by providing employment during the construction of the pipeline and (more importantly) providing long-term careers in a new natural gas exploration and development industry. AGIA was based on the understanding that competition could drive companies to make those commitments. All who recognized that the project economics were positive would compete for the commercial opportunity to build the natural gas pipeline and earn some of those profits. The competition was open to everyone willing to operate within the parameters established by the AGIA "must haves." All competitors, including natural gas pipeline companies, natural gas producers, and LNG projects were eligible to compete.

In exchange for the commitments required in AGIA, the Alaska legislature offered a package of inducements. These include: reimbursement of up to \$500 million of the costs incurred to obtain a regulatory approval from the Federal Energy Regulatory Commission ("FERC") to construct a pipeline; an AGIA project coordinator to facilitate the process; and a stable production tax rate for ten years and fixed royalty valuation methods to anyone who committed to purchase capacity to ship natural gas on the AGIA gasline during its first binding open season. The legislature recognized the state's vital interests in encouraging exploration and development of Alaska's natural gas resources by ensuring a genuine open access pipeline and the lowest reasonable transportation rates. AGIA license applicants were required to commit to a tariff structure that would assure the lowest possible transportation rates and expansion terms to encourage natural gas explorers and prospective developers to compete to explore for and develop Alaska's North Slope natural gas resources and bring them to market. The legislature made the inducements available to an AGIA licensee if the licensee would agree to meet the requirements and make the commitments that the legislature deemed necessary to protect the state's interests.

A Request for Applications ("RFA") was released on July 2, 2007. Applications were due November 30, 2007. The applications covered a variety of projects including both overland natural gas pipelines and LNG projects. After a thorough review, only the application from TC Alaska was found to have met all the threshold application "completeness" requirements of the AGIA statute and RFA. Although none of the applications proposing an LNG application was complete, the commissioners nevertheless compared several LNG options with the TC Alaska Project before making a decision due to the need to resolve the long-standing public debate over which route is preferable. A public review process was held on the TC Alaska application, and more than 350 public comments were received. The comments were considered in development of the Findings and are summarized in Appendix A along with responses.

The commissioners assembled a team of experts to provide analysis to help the commissioners evaluate the TC Alaska application, examine LNG options, and review the Producer Project. The team included numerous experts whose names and contributions are presented in Chapter 2. Their reports, compiled and attached as Appendices, were evaluated in developing these Findings and Determination.

How a Natural Gas Pipeline Project will Progress

Construction of a natural gas pipeline to bring Alaska's natural gas to market is a complex undertaking. There is no single event that will take the state from not having a pipeline to having a pipeline. Rather it is a series of steps, spanning a number of years, with each step affecting the next and requiring significant expenditures. Benchmarks define these steps, and at each one a pipeline developer must re-evaluate the project economics and decide whether to proceed. A successful Alaska natural gas pipeline requires much more than a proposal to build a pipeline; it requires a company that will move through each of the steps to completion. The state's evaluation process considered how likely it is that the TC Alaska Project, various LNG options and the Producer Project will complete the progression from an exciting idea to an operating pipeline.

The first step for the TC Alaska Project is issuance of an AGIA license. That license will make TC Alaska's commitment to obtain a FERC certificate legally enforceable. TC Alaska will not earn any revenues until natural gas begins to flow through the pipeline; approximately ten years after an AGIA license is awarded. In exchange for the state's commitment match of up to \$500 million of the costs of taking the project through FERC certification, the state gets a commitment

from TC Alaska to move the project forward to that benchmark. TC Alaska has committed to submit an application to the FERC by December 2011.¹

After the AGIA license is issued, the next step for TC Alaska is holding an open season. Open season is the term used in the natural gas industry to describe the process a pipeline builder uses to solicit firm shipping commitments for natural gas. Producers that commit to ship natural gas get reserved capacity on the pipeline and fixed transportation rates. The pipeline company gets commitments to transport natural gas that will help it finance construction of the natural gas pipeline.

A natural gas pipeline ultimately needs shipping commitments to be successful. In order to attract shipping commitments, a project must provide positive economic opportunity for gas shippers. The commissioners' analysis shows that the Major North Slope Producers can expect billions of dollars in profits if they commit gas to the TC Alaska Project.

The commissioners' analysis shows that the Major North Slope Producers can expect billions of dollars in profits if they commit gas to the TC Alaska Project.

After an open season, regardless of results, TC Alaska will apply for a FERC certificate. An interstate pipeline must have a certificate of public convenience and necessity from FERC before constructing new pipeline facilities. Among other things, FERC reviews the project, approves the proposed tariff terms, and sets recourse rates based on its review of the costs of construction and operation. Recourse rates are available to all shippers, but any company willing to commit to ship a defined volume for a specific period of time can negotiate better terms. FERC commonly approves negotiated rates. FERC has the authority to impose certificate conditions on the pipeline company that it believes are necessary to protect the public interest.

The proposed transportation rates described in TC Alaska's application are a reasonable first step in allocating the risks and rewards among the parties who will be involved in this project. However, nothing in the AGIA license prevents the state from protecting its interests in front of FERC by arguing for different terms. As the project moves forward and the project costs and

¹ In its Application, TC Alaska premised this and other dates on receiving the AGIA License by April 1, 2008. According to TC Alaska, if the License is issued later this year, these dates may need to be adjusted. However, for ease of reference in these Findings we will continue to refer to the original dates used by TC Alaska in its Application.

expected revenues are better defined, the negotiations between TC Alaska and potential shippers will continue. If, after they have negotiated their cost of transportation, the Major North Slope Producers can demonstrate that some change in the state's fiscal regime is necessary to enable them to earn a fair return, then the legislature can consider changes to the state's fiscal system.

After a FERC certificate is awarded, the complex process of pipeline construction begins. Because of the remote location and large size of this pipeline, the process of ordering materials and bringing them to the site will require extensive logistical planning. Construction of the pipeline and the associated processing plant will take at least three years.

Throughout the process, TC Alaska will continue to evaluate if there is demand for more capacity in the pipeline. Capacity can be added by including additional compressor stations ("compression") or adding parallel pipe ("looping"). As additional natural gas fields are discovered and brought into production, the TC Alaska pipeline will add capacity and continue to create more jobs in Alaska's natural gas industry.

TC Alaska Project Proposal

TC Alaska proposes to build a 48-inch diameter, high-pressure pipeline capable of carrying between 3.5 and 5.9 billion cubic feet per day (bcf/d). The project would run 1,715 miles from a natural gas treatment plant at Prudhoe Bay on the North Slope to interconnect with the Alberta Hub in Canada. This is the second largest natural gas trading center in North America, which interconnects with pipelines that carry more than 10 bcf/d of gas into U.S. markets. The Alaska section will be approximately 750 miles long with six compressor stations at startup and five natural gas delivery points in Alaska.

The net present value ("NPV") calculation methodology used to assess TC Alaska's application allows the State to consistently and transparently assess its future value in common terms. Because TC Alaska's application, the LNG options, and the Producer Project are based on a variety of assumptions and projections, it is essential to use common terms to assess the impacts of these assumptions and projections on

Net Present Value – NPV is an economic calculation used to determine the value of long-term projects. It recognizes that a dollar today is worth more than a dollar in the future. Future income (or "net value") is measured by its "present" value through discounting. The NPV calculation allows assessment of profits that will be spread over decades.

the value to the state. With the basic assumptions rendered into common terms, the state can evaluate whether the TC Alaska Project serves the best interests of the state and compare it to LNG options and the Producer Project.

The path offered by TC Alaska's plan is likely to succeed. TC Alaska provided a work plan that is technically reasonable, feasible and specific. It includes the use of technology that TransCanada is now using to operate pipelines in climates similar to Alaska's. The schedule, including the timing of U.S. and Canadian regulatory approvals, is aggressive but reasonable and appropriate. TransCanada has the financial ability to contribute equity to the project and to obtain the financing necessary for construction. TransCanada has a strong record of performance in developing other large projects and a positive record of integrity and business ethics.

The commissioners also considered whether sufficient natural gas exists on the North Slope to fill the capacity of TC Alaska's proposed pipeline for 25 years. Alaska has enough natural gas resources to fill the TC Alaska pipeline for 25 years and for decades longer. This is true even though Point Thomson natural gas may not be available for any project during its initial years due to the operator's failure to develop the Point Thomson Unit in a timely manner, and the significant potential that the Unit must first be developed for liquid condensate and oil. The unavailability of Point Thomson gas, however, is more than offset by the unique profitability of the natural gas at Prudhoe Bay. In fact, despite the unavailability of Point Thomson gas, the state and the Major North Slope Producers stand to receive significantly positive cash flows and NPVs from the Project even if the Prudhoe Bay gas is the only gas ever produced on the North Slope. If, in addition to the Prudhoe Bay gas, natural gas from Alaska's other vast resources is also produced (including Point Thomson gas—which is very likely), then the Project will be even more profitable.

The state and the Major North Slope Producers stand to receive significantly positive cash flows and NPVs from the Project even if the Prudhoe Bay gas is the only gas ever produced on the North Slope. If, in addition to the Prudhoe Bay gas, natural gas from Alaska's other vast resources is also produced (including Point Thomson gas—which is very likely), then the Project will be even more profitable.

Additionally, the commissioners considered the claim by the Major North Slope Producers that TC Alaska cannot succeed because of the risk that, if it builds the Project, it would be sued by former partners that worked with other TransCanada affiliates to try to advance an Alaska

gasline project more than two decades ago. As discussed in Chapter 3, the commissioners find that the potential claims against TC Alaska and its affiliates are extremely weak, and that the Producers have failed to support their speculative theory. As a result, the commissioners conclude that the risk of litigation over this issue does not present a significant barrier to the TC Alaska Project's likelihood of success, including its ability to obtain financing.

The commercial terms proposed by TC Alaska are reasonable. TC Alaska's plan for managing cost overruns will reduce the risk for shippers of tariff increases. The TC Alaska proposal provides the Major North Slope Producers with several significant commercial opportunities. They can construct and own the gas treatment plant on the North Slope. They can also own an equity share in the TC Alaska pipeline. Further, the terms may become even more attractive through negotiations with the Major North Slope Producers.

Although there are project risks, none of them are significant enough to outweigh the TC Alaska Project's likelihood of success. Natural gas prices are not likely to decline enough to make the project uneconomic. The risk that there are insufficient resources on the North Slope to fill the proposed pipeline is low. The commissioners anticipate that the state's current fiscal structure will allow companies that develop North Slope gas and transport it on the TC Alaska pipeline to earn a significant profit.

The commissioners anticipate that the state's current fiscal structure will allow companies that develop North Slope gas and transport it on the TC Alaska pipeline to earn a significant profit.

The TC Alaska Project is viable. TransCanada has successfully constructed many natural gas pipelines and now operates 36,000 miles of natural gas pipelines in North America. The TC Alaska Project will provide positive economics to the state and federal governments, the Major North Slope Producers and to TC Alaska. It is likely to succeed because all of the stakeholders will benefit from success and risk losing a lot if the project fails.

Alternatives to the TC Alaska Proposal

There were no applications found complete that proposed an instate pipeline and LNG project. In addition, although the Major North Slope Producers did not submit an AGIA application, BP and ConocoPhillips recently announced the Producer Project. To help determine whether TC Alaska's pipeline proposal maximizes benefits and is in the best interest of the state, the commissioners evaluated LNG project options from the North Slope to an LNG plant in Valdez and the Producer Project.

The LNG project options examined were guided by the LNG project proposals submitted under AGIA. Under the same assumptions used to analyze the TC Alaska Project, all LNG project options resulted in less value to the state and the Major North Slope Producers. Although an LNG project would be able to tap the higher prices, that we expect to be available in the Asian market, the LNG projects have significantly higher costs and thus result in lower NPV to the state or Major North Slope Producers. The commissioners' analysis does not reveal comparative benefits in either timing or costs associated with an LNG project.

Even if LNG had demonstrated comparable NPV to the TC Alaska Project, the LNG projects would still not be preferable to the TC Alaska Project. The commissioners' analysis reveals that LNG projects have a much lower likelihood of success compared to the TC Alaska Project. An LNG project will face unique financing and commercial challenges for several reasons. These include the need to negotiate multiple and concurrent agreements for the purchase, pipe transport, liquefaction, shipping, re-gasification, and sale of natural gas. An LNG project also faces significant challenges because the Major North Slope Producers have made it clear that the Asian market is not their preferred market. In addition, an LNG project will face significant risk of not being permitted to export the gas to its primary market in Asia.

The primary markets for Alaskan LNG are in Asia, thus an LNG project would not address North American energy security and likely faces significant political opposition to exporting the gas.

The gas quality (specifically, requirements for higher heat content) required to fulfill long-term contracts to an Asian buyer is likely to preclude the development of a petrochemical industry in Alaska associated with an LNG project. Some propane can be removed from the natural gas stream to meet Alaskan energy needs. However, the other natural gas liquids would need to remain in the stream to satisfy the expected contract requirements of the Asian market.

In addition, LNG projects create concerns about genuine open access at the liquefaction plant. FERC cannot impose open access requirements on a liquefaction plant. Just as pipeline tariff terms can create disincentives for exploration, so can the processing terms at the liquefaction plant. The lack of genuine open access at the liquefaction plant will increase risks for explorers and limit the incentive for new natural gas exploration and development on the North Slope. The career opportunities and revenues associated with future development and expansions offer great value to Alaska; the limitations on those factors associated with an LNG project make it less attractive.

When compared to an exclusive LNG project, the overland gasline project proposed by TC Alaska provides an opportunity for a successful LNG "Y line" project or "spur line." The likelihood of success of an LNG project is greatest when it is constructed as a "Y line."

Approving the TC Alaska Project will enhance the prospects for a successful "Y line" LNG project as it will reduce costs, financing challenges, and commercial coordination challenges unique to LNG.

The dynamics of a producer-owned and operated pipeline are very different from those of a third-party owned pipeline. An entity that both produces natural gas and owns the pipeline, like the Producer Project, earns revenues through sales of natural gas and shipment of the natural gas. Such an entity is not necessarily as driven to keep costs low—a producer who owns a pipeline and the natural gas shipped through the pipeline, is essentially paying itself to ship the natural gas, and so is less sensitive to the transportation rate. And because they own or produce the natural gas, there is a reduced economic driver to explore for and develop additional resources until such time as it is necessary to maintain shipping volumes through the pipeline. As the state's experience with TAPS has shown, combining pipeline and shipper responsibilities can harm the state's interests. For many of these same reasons, the Producer Project suffers the risk of being stalled by anti-trust challenges.

Any Alaska natural gas pipeline project can proceed without state assistance. AGIA is not the exclusive vehicle for construction of an Alaskan natural gas pipeline; rather it was created to ensure that a natural gas pipeline is constructed that meets Alaska's needs. It was not designed to preclude the Major North Slope Producers from owning and operating the natural gas pipeline. Instead, its goal was to ensure that if they did, they would act like an independent pipeline company rather than an integrated gas producer and pipeline company. The state's interests would be protected through commercial tariff terms that ensure the lowest possible tariffs, guarantee genuine open access and expansion of the pipeline to encourage continued development of Alaska's vast natural gas resources.

On the day before the AGIA applications were due, ConocoPhillips publicly announced their desire to pursue a natural gas pipeline outside the AGIA process. Negotiations of fiscal conditions were a pre-condition of moving forward with the project. The administration chose to continue the competitive AGIA process in favor of exclusive negotiations. Recently, BP and ConocoPhillips announced the pursuit of another natural gas pipeline project: "Denali™ - the Alaska Gas Pipeline" ("Producer Project"). Negotiations over fiscal conditions are no longer

seen as a pre-condition of forward movement, but are now seen as a pre-requisite to a successful open season.

None of the important commercial terms of the Producer Project are defined and, unlike TC Alaska, the Producer Project makes no enforceable commitments. There is no enforceable commitment to adhere to their stated timeline or to achieve additional milestones, such as applying for a FERC certificate. There is no information on the tariffs the Producer Project would offer, let alone an enforceable commitment to provide genuine open access. This makes the option currently presented by the Producer Project extremely risky for the state. The Producer Project was offered outside of the AGIA process, and may continue in parallel to TC Alaska's efforts.

None of the important commercial terms of the Producer Project are defined and, unlike TC Alaska, the Producer Project makes no enforceable commitments.

Some have suggested that the state should "save" its \$500 million, and exclusively pursue the Producer Project rather than the TC Alaska Project. However, no company would turn down \$500 million unless it expected to extract even greater concessions later from the state. Indeed, during the SGDA process the Major North Slope Producers demanded the state provide billions of dollars in fiscal concessions—far more than the \$500 million provided under AGIA. In addition, the Producers demanded numerous other concessions which would have required the state to relinquish a large portion of its sovereignty. There is no reason to expect BP and ConocoPhillips would not demand similar concessions if the state rejects the TC Alaska application. In addition, these objections to AGIA ignore the fact that the state will receive numerous benefits for the \$500 million, including lower rates that more than offset the \$500 million and enforceable commitments to move the project forward.

In sum, the TC Alaska Project will enhance the likelihood of success of an LNG "Y line" project. Facilitating a "Y line" may protect the state against future price changes in North American and LNG markets. The Producer Project, because of its undefined commercial terms, offers enormous risks and uncertain rewards to Alaska.

In sum, the TC Alaska Project will enhance the likelihood of success of an LNG "Y line" project. Facilitating a "Y line" may protect the state against future price changes in North American and LNG markets. The Producer Project, because of its undefined commercial terms, offers enormous risks and uncertain rewards to Alaska.

Summary of the Findings

- The TC Alaska Project is economically viable. At expected natural gas prices, the project will generate billions of dollars and substantial rewards for Alaskans, the Major North Slope Producers, the state and federal governments, and TC Alaska.
- TransCanada has a proven track record in pipeline design, construction, and operation and currently operates more than 36,000 miles of gas pipeline in North America. It has the financial resources to meet the challenge of financing this project.
- The TC Alaska Project plan is technically sound and feasible, and the project schedule is appropriately aggressive but reasonable.
- The extremely positive economics of TC Alaska's Project, combined with the legal and political context, provide favorable conditions for attracting shipping commitments for the project.
- Overall, the TC Alaska Project is likely to succeed.
- Exclusive LNG project options would most likely result in lower NPV to the state than the TC Alaska Project, would not easily accommodate expansions and the open access terms that would cause more long-term jobs to be added to the state's economy, and have a lower likelihood of success than the TC Alaska Project.
- A "Y-Line" addition to the TC Alaska Project is more likely to succeed than other LNG project options.
- The key for adding long-term jobs for Alaskans is a pipeline that encourages exploration and development of North Slope natural gas. The TC Alaska Project makes legally enforceable commitments that will result in such a pipeline.
- Alaskans need low-cost energy. This can be provided by an Alaskan gas pipeline project that has a low transportation cost (tariff), is committed to expansion to accommodate new found natural gas, provides access for natural gas off-take and spur lines in Alaska, ensures that natural gas delivered in Alaska only pays transportation costs for the mileage that the natural gas has traveled, and results in maximum revenue to the state and its citizens. The TC Alaska Project meets these objectives.

- The TC Alaska Project will not preclude construction of a smaller pipeline from the North Slope to Southcentral Alaska. Issuing a license to TC Alaska may increase the likelihood that plans for a "bullet line" or "spur line" will become reality.
- Similar to the failed SGDA contract, the Producer Project is not guaranteed to continue to advance the project to construction or even FERC certification and will likely require undefined concessions from the state. Similar to TAPS, the Producer Project will likely result in commercial terms that do not protect Alaska's interests.
- The TC Alaska Project provides opportunities for significant Producer ownership. If the state determines that additional concessions are needed, they can be added to the TC Alaska Project to ensure that any concessions result in a pipeline that maximizes benefits for Alaskans.

Determination

The commissioners found TC Alaska's application to be complete and in compliance with the AGIA statute and Request for Applications. Following an extensive evaluation process, the commissioners determine that the natural gas pipeline project from the North Slope to Canada proposed by TC Alaska is the project that will sufficiently maximize the benefits to the people of this state. The commissioners further determine that the TC Alaska Project merits the award of a license under AGIA. These Findings and Determination will be submitted to the presiding officers of each house of the Alaska Legislature for approval of the license.

The license will be issued to TC Alaska as soon as practicable after the effective date of a bill approving the license proposed by the commissioners. If a bill is not passed within 60 days of the date that the legislative presiding officers receive this Determination, the commissioners may not issue the proposed license and may request new applications.

This Executive Summary presents an overview of the Written Findings and Determination by the Commissioners of the Alaska Departments of Natural Resources and Revenue for issuance of a License under the Alaska Gasline Inducement Act (AGIA). It summarizes the commissioners' process for evaluating TC Alaska's proposed natural gas pipeline project and the commissioners' determination as provided by AGIA. This Executive Summary is part of the commissioners' Written Findings and Determination that is anticipated to be published on May 28, 2008. This document is a summary only, and is not the commissioners' final determination under AGIA and is not a final agency action.

HOUSE ROLL CALL – 2007

Subject:

Date:

Representative	Yea	Nay	Exc	Abs
Buch				
Chenault				
Cissna				
Coghill				
Crawford				
Dahlstrom				
Doll				
Doogan				
Edgmon				
Fairclough				
Foster				
Gara				
Gardner				
Gatto				
Gruenberg				
Guttenberg				
*Harris				
Hawker				
Holmes				
Johansen				
Johnson				
Joule				
Kawasaki				
Keller				
Kelly				
Kerttula				
LeDoux				
Lynn				
Meyer				
Nelson				
Neuman				
Olson				
Ramras				
Roses				
Salmon				
Samuels				
Seaton				
Stoltze				
Thomas				
Wilson				
	Yea	Nay	Exc	Abs
TOTALS				

SENATE ROLL CALL

_____, 2007

	YEAS	NAYS	EX	AB
BUNDE				
COWDERY				
DAVIS				
DYSON				
ELLIS				
ELTON				
FRENCH				
HOFFMAN				
HUGGINS				
KOOKESH				
McGUIRE				
OLSON				
STEDMAN				
STEVENS				
THERRIault				
THOMAS				
WAGONER				
WIELECHOWSKI				
WILKEN				
*GREEN				
Senate Total				
House Total				
TOTAL				
Changed Senate				
Changed House				
TOTAL				

Remember not to Store & Print House voting machine so we can tally vote changes.

#3

Enstar. Nat Gas Co.

Curtis Thayer
Director
Corporate & External
Affairs

Gene Dubay
SVP - COO
Continental Energy Systems

Andrew White
Manager
Bus. Develop. & Revenue
Forecasting

#1
melba-piispanen @ legio

Bill Walker
Card Richards

#2
AR National Day
... ..
... ..

... ..
... ..

#1

AK Gasline ~~Port~~ Authority

Authority

Bill Walker.
Craig Richards

#2

AK Natural Gas
Development
Authority

Harold Heinzl
ANGDA CEO



FOR IMMEDIATE RELEASE

Denali – The Alaska Gas Pipeline LLC Announces Appointment of President

ANCHORAGE, June 12, 2008. Denali – The Alaska Gas Pipeline LLC today announced the appointment of Bud E. Fackrell as President. The project was announced on April 8 by ConocoPhillips and BP, and is focused on the development of a large diameter, high pressure natural gas pipeline from Alaska's North Slope into North American markets.

Fackrell is a seasoned oil and gas industry executive, serving as Senior Vice President for BP's Alaska Consolidated Team until today's announcement. He had responsibility for all of BP's operations on the North Slope except Prudhoe Bay (including Endicott, Liberty, Milne Point, and North Star & Badami). He held this post since his arrival in Alaska in August, 2006.

Fackrell has over 33 years of experience in the oil and gas industry. Prior to moving to Alaska, he was CEO and General Manager, Abu Dhabi Marine Operating Company, a large joint venture operating all the offshore oil and gas concessions in the Emirate of Abu Dhabi. Previous roles include Asset Delivery Manager for BP in the Rockies, where he developed significant experience with the North American natural gas business, General Manager – Gulf of Suez District, Gulf of Suez Petroleum Company in Egypt, and a number of other US and international postings.

Fackrell is married and has eight grown children and lives in Anchorage, Alaska.

For more information, contact:

Steve Rinehart, for BP Alaska Gas Pipelines LLC at (907) 564-5668

Natalie Lowman, for ConocoPhillips Denali Company at (907) 263-4153

www.Denali-TheAlaskaGasPipeline.com

Joint mtngs
in JNU

Sharon Long

From: Cheryl Sutton
Sent: Tuesday, May 27, 2008 2:21 PM
To: Portia Babcock; Miles Baker; Sharon Long; John Bitney
Cc: Linda Hay; Tom Maher
Subject: RE: House and Senate arrangements

Greetings!

One issue that I need clarification on is whether the House and Senate will be meeting separately or jointly to receive the LBA Consultant's presentations. I am working with our folks to organize their presentations, etc. and this piece of information would be very useful. Thanks.

Stedman/Huggins - joint

Cheryl

-----Original Message-----

From: Portia Babcock
Sent: Tuesday, May 27, 2008 12:47 PM
To: Cheryl Sutton; Miles Baker; Sharon Long; John Bitney
Cc: Linda Hay; Tom Maher
Subject: RE: House and Senate arrangements
Importance: High

Cheryl,

For organizing and coordinating the JUNEAU hearings (June 3-10), the primary contacts for the Senate are:

Portia Babcock
Miles Baker
Sharon Long

-----Original Message-----

From: Cheryl Sutton
Sent: Friday, May 23, 2008 12:38 PM
To: Tom Maher; Miles Baker; Sharon Long; John Bitney
Cc: Linda Hay; Portia Babcock
Subject: House and Senate arrangements

I need to know who will be in charge of scheduling for the House and Senate for the presentations from our consultants.

We will have Barry Pulliam with Econ One; Lesa Adair with Muse Stancil; John Neri with BSA Energy; Dan Dickinson; and Bill Mogel with Saul Ewing. Steve Porter arrives in Juneau on the evening of June 8.

Thanks.

Cheryl

|| annually
15 Ton
million ||

2.7 BCF/d



Alaska Gasline Port Authority

Presentation to the Alaska Legislature

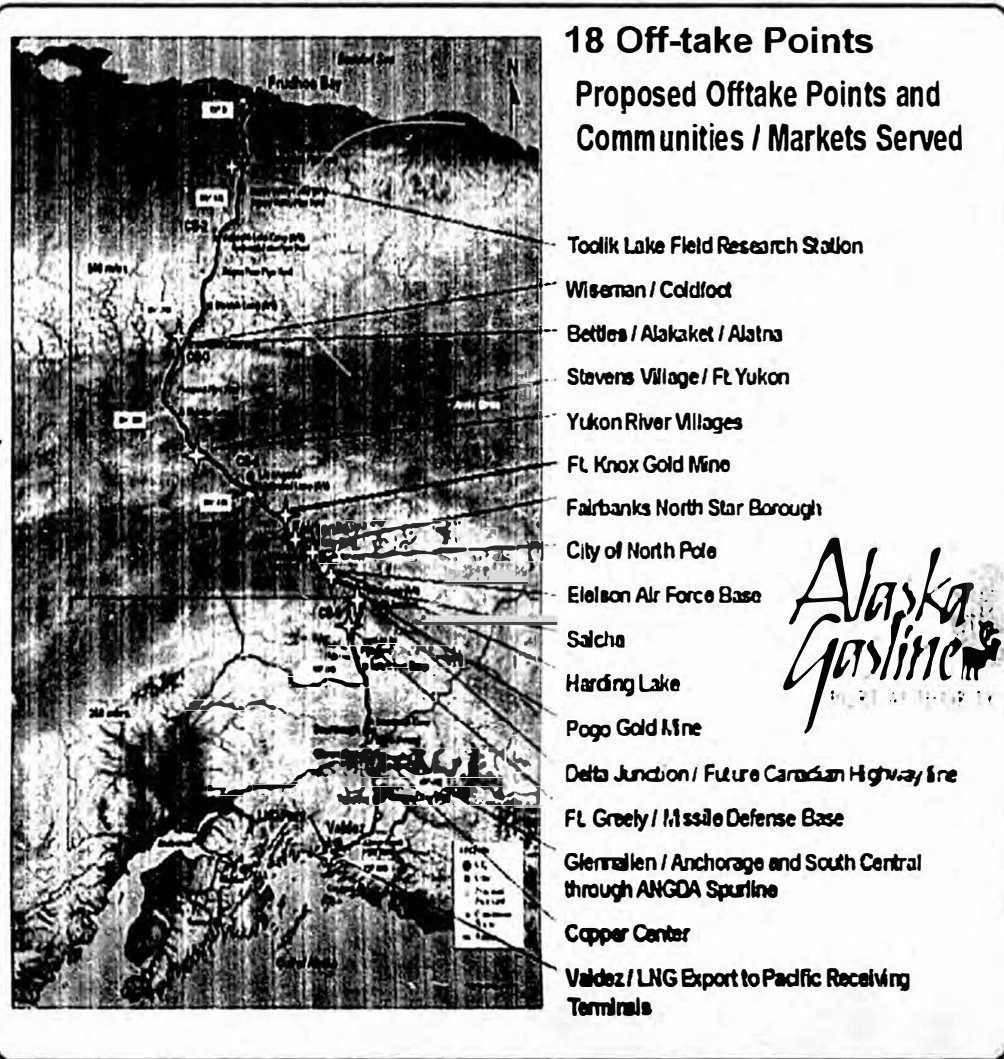
June 12, 2008

The All Alaska Project

Gas Conditioning Plant in Prudhoe Bay
removes impurities
compresses and chills gas to
pipeline specifications

Pipeline from Prudhoe Bay to Valdez
pre-build to Delta Junction for later
tie-in for the Alaska/Canada Highway
Project
tie-in at Glennallen for a spur line to
South Central natural gas grid

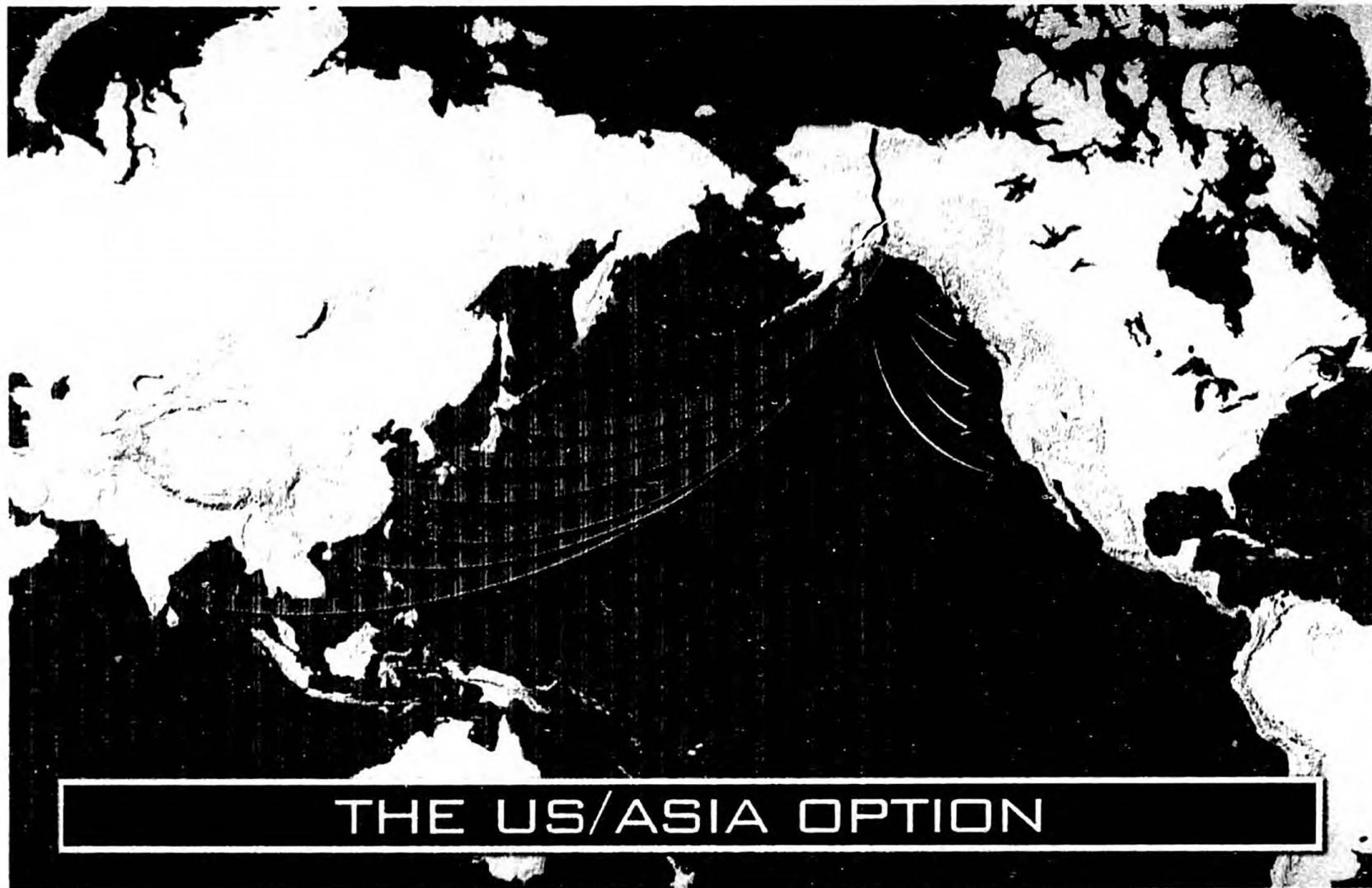
LNG Facility in Valdez
integrated LNG liquefaction and LPG
extraction facilities
includes storage and vessel loading
facilities





Markets

- Port Authority Markets
 - Alaska
 - Asia (Japan, Korea, Taiwan)
 - West Coast
 - Hawaii



THE US/ASIA OPTION



Export License

- **DOE Viewpoint**
 - Presumption of export
 - Allow market to work
 - Balance of payments
- **Kenai 1967**
 - Renewals: 1982, 1987, 1988, 1999, 2008
- **Valdez 1989 (FERC Order 350)**
 - 14 MTA 25 years (Japan, Korea, Taiwan)



Btu Content

- ANS gas very high in liquid content (1084 btu/scf)

- Liquids in Alaska for value added – Options
 - LNG base case: extract propane & butane (1060 btu/scf)
 - 23,000 barrels per day
 - 30 x Alaska LPG consumption (30,000 gal)
 - Extract more liquids in Alaska
 - Can also extract ethane for value added
 - In current market environment lean gas to Asia not an issue

LNG imports into Asia: examples of gas composition

HV Level (Btu/scf)		Super Lean		Lean	
		1010-20	1020-40	1040-90	1090-
Project		Kenai	Egypt T&T	Nigeria Abu Dabi Qatar E. Guinea	Malaysia Oman Algeria Brunei Indonesia Australia
Typical Components	C1	99.6	98.1	92.2	90.1
	C2	0.2	1.8	5.1	5.4
	C3+	0.2	0.1	2.7	4.5
Gross Heating Value		1010	1025	1090	1120
Typical Project		Kenai	Egypt	Nigeria	Malaysia

Record of Receiving Lean LNG (Japan)

Most of Japanese Utilities are Capable of Receiving Super Lean Cargoes.

Utilities Capable of Receiving:

Super Lean

(<1040 Btu/scf: Egypt, T&T, Kenai)

- Tokyo Electric
- Tokyo Gas
- Chubu Electric
- Osaka Gas
- Kansai Electric

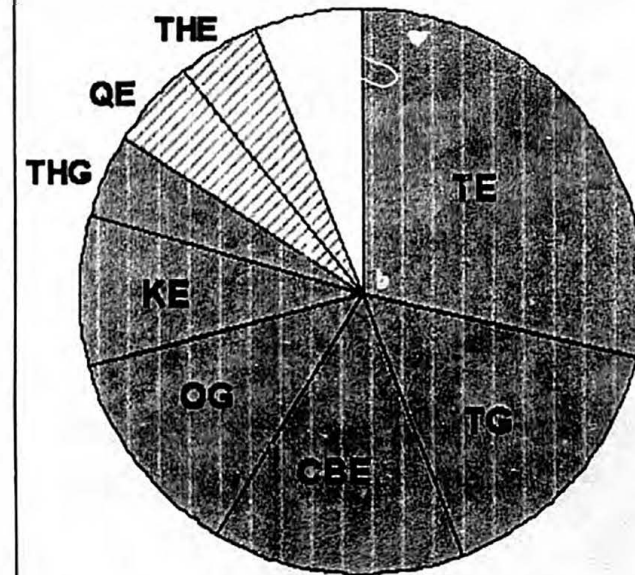
Total LNG Share:
Approx. **85%**

Lean

(<1090 Btu/scf: Abu Dabi, Qatar, Nigeria, E.Guinea)

- Tohoku Electric
- Kyushu Electric

Approx. **10%**



"LNG Share by Utilities in Japan"

Total (2007) 61,580,000 ton

Record of Receiving Lean LNG (Korea)

All Korean Utilities are Capable of Receiving Super Lean Cargoes.

Utilities Capable of Receiving:-

Super Lean 

(>1040 Btu/scf : Egypt, T.T, Kenai)

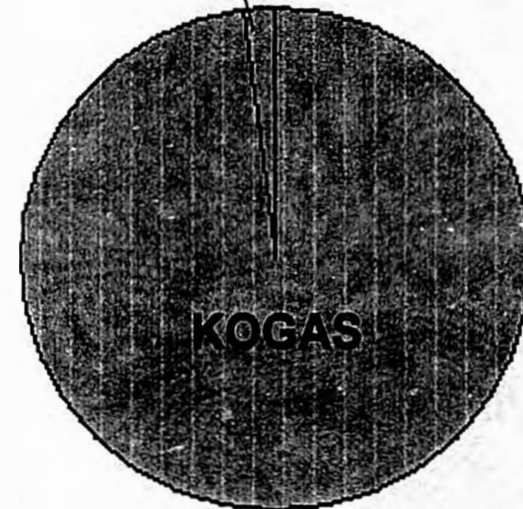
Kogas

SK

Posco

Total LNG Share:
Approx. **100%**

SK/Posco



"LNG Share by Utilities in Korea"

Total (2007) 25,568,900 ton



Initial Project Volume

- All-Alaska project volume 2.7 not 4.5 bcf/d
- Reasons AGPA Chose 2.7 bcf/d
 - AOGCC (PBU Off-take)
 - Market Acceptance
 - Prove up reserves for expansion
- Better fit if no short-term PTU availability



Liquefaction Cost

- Administration costed LNG plant using “comparable worldwide projects”
 - “The Technical Team did not have an AGIA-compliant application to directly evaluate regarding the cost of liquefaction.”
 - \$22.5 billion (4.5 bcf)

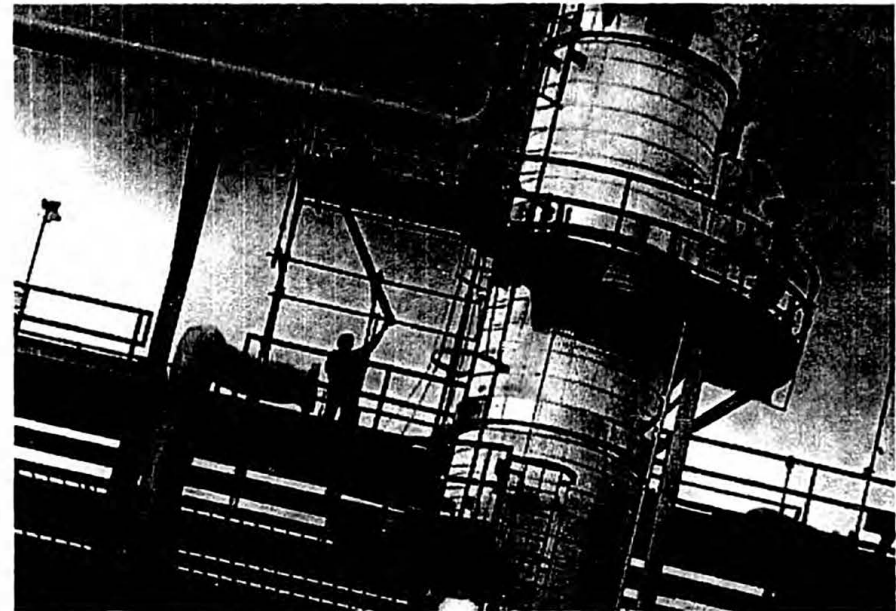
- Dangers of data mining – appears that administration’s process
 - May have included upstream costs as part of integrated project costs
 - Missed 40% savings on compression resulting from high pressure of dense phase pipeline and ambient conditions in Valdez

Liquefaction Cost

Bechtel LNG plants:
Kenai, Algeria,
Indonesia, UAE, Libya,
Egypt, Trinidad,
Australia, Angola, etc.

Only licensee for
ConocoPhillips
Cascade Process

- Single most creditable
source for cost estimate



4th Train - Trinidad



Liquefaction Cost

- Bechtel's Work for AGPA
 - 2000-05: \$8 million cost estimate, 55,000 man hours
 - 2007: \$2 million AGIA update, 50+ engineers
- Results - Valdez LNG Plant
 - \$7.0 billion* for 2.7 bcf (vs. \$22.5 for 4.5 bcf)
 - Bechtel estimates low level of cost overrun risk on liquefaction because proven technology and design
 - Alaska pipeline component has highest capital cost uncertainty because substantially more unknowns

* Excludes owner and financing costs.

Netback



- Econ One (Fall 2006)
 - LNG first on Y-line has higher NPV if LNG 3 years before Canadian leg
 - This was when LNG had inferior netback
- LNG has superior netback, period.
 - ~\$1.00 / mmBtu for 2.7 bcf LNG vs. 4.5 bcf Highway
 - Greater advantage for 3.5 bcf Highway
 - Even greater advantage if market optionality considered

All-Alaska Route Permitted



- Pipeline 100% within existing TAPS corridor
- No foreign issues
- YPC – 20+ years (\$100 million) of permits & process
 - Saves years
 - We know the answer is “yes”

Canadian Delay – Bennet Jones Report



- Environmental (NPA vs. Newer Laws)
 - No legal or even identified right-of-way
 - “likely” pressure for review process similar to Mackenzie Gas Project
- First Nations (40+)
 - Constitutional obligation to consult
 - Legal challenge “likely” and take “several years” to resolve
 - Can be “fatal” since they can stop project until adequate consultation

*Northern
Pipeline Act*

NPA exclusivity to TransCanada

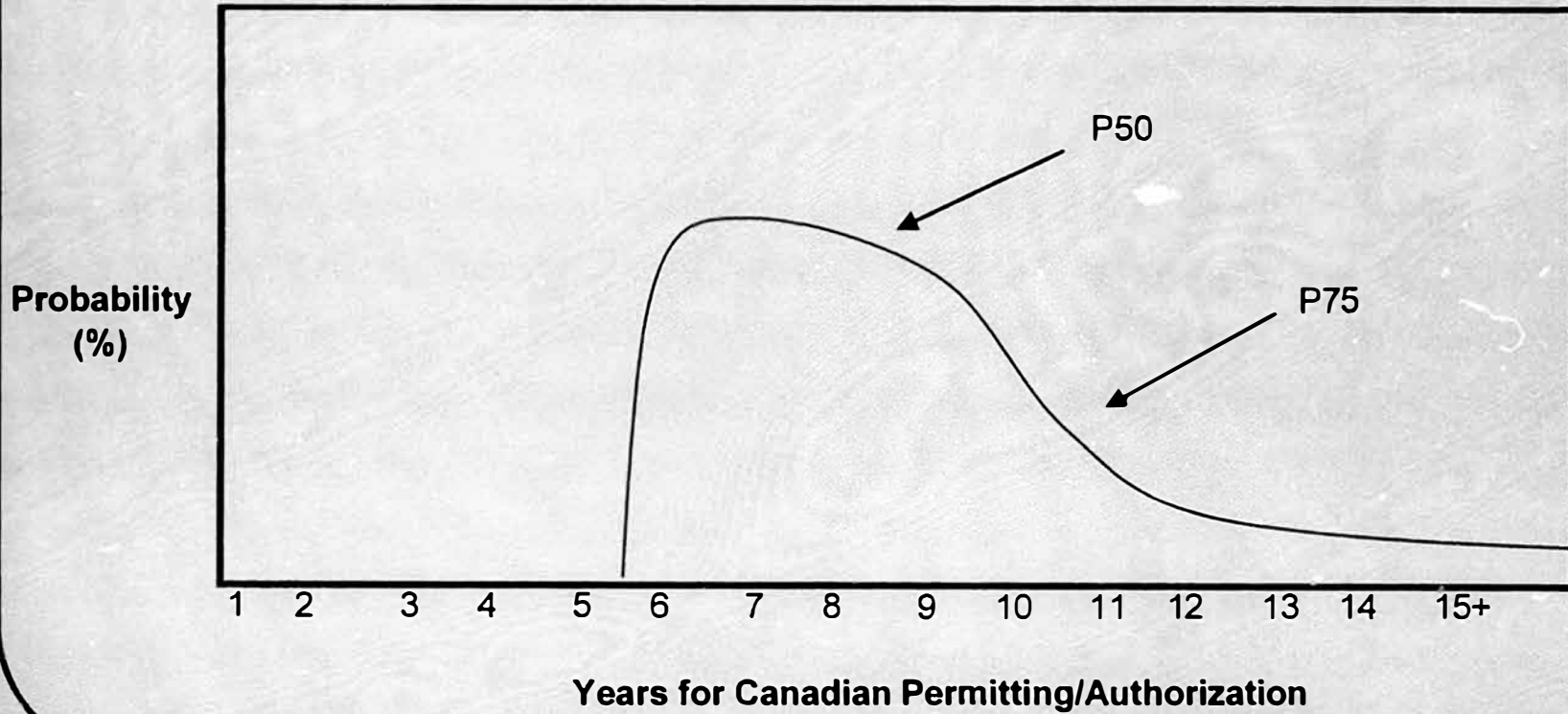
— therefore Denali must argue that there is NO exclusivity

- Mackenzie goes first — *producers repeatedly say this*

Canadian Delay



Hypothetical Timing Profile





Risk

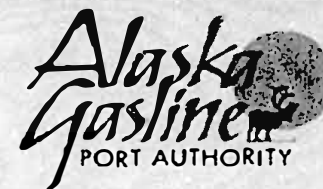
- LNG vs. Pipeline
- Structural vs. Commercial
- Alaska/U.S. vs. Canada
 - LNG - Alaska controls project risks

Risk



- The greatest risk in the project is Alaska's future

Which Project Goes First



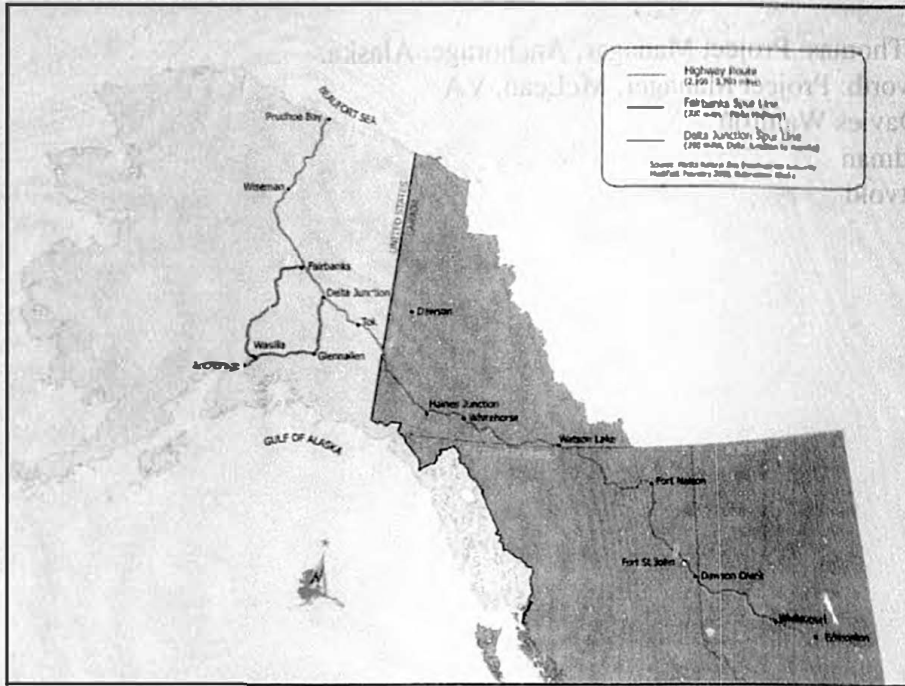
- Administration states Canadian leg should go first
- AGPA states All-Alaska leg should go first
 - David Keane (BG) testified last session that the LNG project would be the enabler for a later Canadian Highway project
- Let market/shippers decide – eliminate no options



Way Forward Options

- Build All-Alaska gas pipeline now
- Pass AGIA but...
- Take control of Alaska's future
 - State contracts for building of All-Alaska gas pipeline now and begin moving Alaska's gas to Alaskan and other markets.

Alaska Natural Gas Needs and Market Assessment: 2008 Update of the Industrial Sector



Prepared by
Science Applications International Corporation

For
Alaska Natural Gas Development Authority (ANGDA)

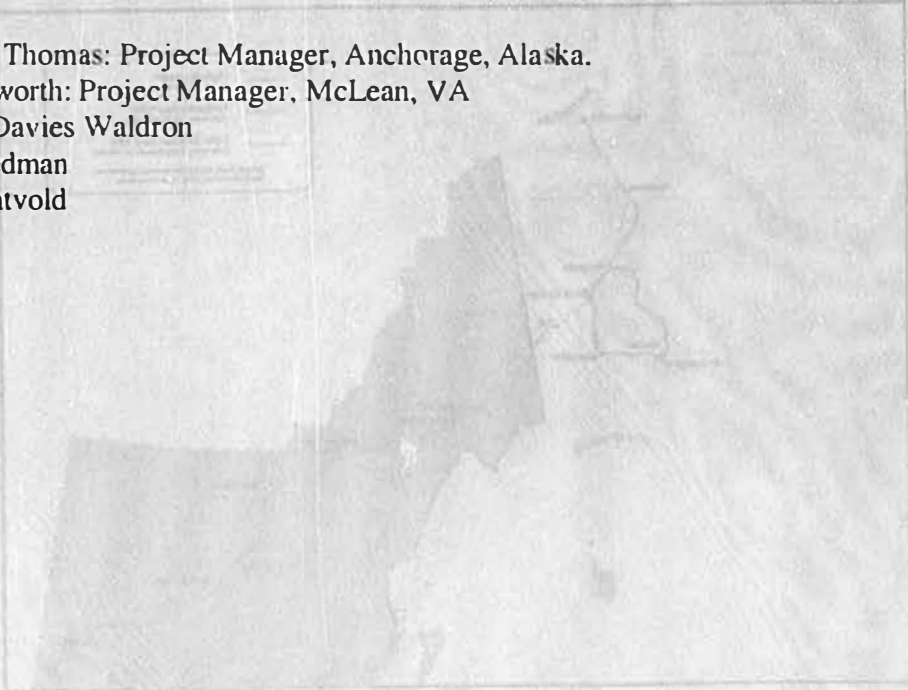
June 2008

- Harold Hefnig
- Tony Izzo

Alaska Natural Gas Needs and Market Assessment: 2008 Update of the Industrial Sector

Technical Contributors - SAIC

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Delma Bratvold



Disclaimer

This report did not involve the collection or generation of any new or original data. All conclusions and judgments presented in this report are based on information obtained at the time of the assessment. This report is intended to be used in its entirety. Taking or using in any way excerpts from this report are not permitted because, when taken out of context, such excerpts run the risk of being misinterpreted and are not representative of its findings; therefore, any party doing so does so at its own risk.

In preparing this report, SAIC has relied on verbal and written information provided by secondary sources and interviews, including information provided by customer. Because the assessment consisted of evaluating a limited supply of information, SAIC may not have identified all potential items of concern and/or discrepancies and, therefore, SAIC warrants only that project activities under this contract have been performed within the parameters and scope communicated by ANGDA and reflected in the contract. SAIC has made no independent investigations concerning the accuracy or completeness of the information relied upon.

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Alaska Natural Gas Needs and Market Assessment: 2008 Update of Industrial Sector

1.0 Purpose

The objective of this report is to provide an updated assessment of the potential value of gas-intensive industries in South Central Alaska if a pipeline is constructed that provides Alaska North Slope (ANS) gas to this region. The original study, *Alaska Natural Gas Needs and Market Assessment*, was conducted for the US Department of Energy, National Energy Technology Laboratory, and released in April 2006. The 2006 Study addressed gas supply and demand from all sectors in Central and South Central Alaska, including residential, commercial, power, and industrial needs. Industrial demand included both gas-intensive industries (i.e., LNG, fertilizer, petrochemical, GTL, and LPG), and other industries for which demand is primarily for power. An investment model was applied to assess potential gas-intensive industries, which are particularly sensitive to their feedstock (i.e., gas) prices. Since 2006, oil, natural gas, and product prices have risen considerably, both domestically and internationally, requiring an update to the financial modeling previously performed for gas-intensive industries.

2.0 Key Findings

The results of this study suggest the following key findings:

- The recent rise in natural gas and product prices has improved feasibility of the assessed natural gas-intensive industries in South Central Alaska.
- Under base case price assumptions, petrochemicals and liquid petroleum gas (LPG) are potential sources of large increments of natural gas liquids (NGL) demand. They could provide an additional 127,000 barrels per day (bbl/d) of NGL consumption, 201 million cubic feet per day (MMcf/d) of gas equivalent.
- Both the current liquefied natural gas (LNG) export facility in Nikiski and a greenfield gas-to-liquids (GTL) plant may require sales contracts in premium markets for economic feasibility under the low price scenario. Natural gas demand from these industries is estimated at 375 MMcf/d and 464 MMcf/d for LNG and GTL, respectively.
- The investment climates for all assessed industries will remain highly uncertain given ongoing volatility in energy and product prices.
- The greatest uncertainty is associated with GTL due to the combination of evolving market, costs, and technology.

3.0 Scope and Assumptions

3.1 Gas Pipeline Operation

Natural gas and natural gas liquids (NGL) demand by industry is assessed based on the assumption of a dense-phase wet gas line that delivers ANS natural gas and NGL to South Central Alaska through a spur pipeline that branches off from the proposed Alaska Natural Gas Pipeline (ANGP) that would transport natural gas from the ANS to Canada and the Lower 48 States. The gas-intensive industries assessed in this report are assumed to be located in South Central Alaska due to expected lower operating and capital costs and proximity to export terminals and major trade routes.¹ As determined in the 2006 Study, an NGL-rich stream will generate the greatest level of industrial demand in Alaska.

The route of the pipeline to South Central Alaska is not determined in this update. However, for the purpose of modeling the pipeline tariff, it is assumed that the Alaska Natural Gas Pipeline (ANGP) from ANS to the Lower 48 States is constructed with the spur line branching off in Central Alaska (e.g., Delta Junction, or Fairbanks). As in the 2006 Study's largest wet gas pipeline scenario, pipeline capacity from the ANS to Central Alaska is at least 4.5 Bcf/d, and the spur line capacity is approximately 1 Bcf/d, with operations commencing in 2015.

Also as in the 2006 Study, the wet gas spur line is assumed to be enriched with NGL extracted at a separator plant in Central Alaska. Surplus dry gas from the separator (i.e., in excess of South Central needs) is then re-injected into the ANGP for delivery to the Lower 48 States. The extracted NGL are assumed to be transported through a spur line to meet demand from two, new South Central industries: petrochemicals and LPG. The amount of enrichment in the spur line is adjusted based on the main line gas composition to meet the industrial demand for ethane (i.e., the petrochemical industry). In contrast, the LPG industry demand is adjusted based on the average gas composition in the ANGP from the ANS, and the resulting amount of propane and butane in the enriched mixture removed by the Central Alaska separator. Assumed gas composition at the separator inlet and outlet is described in Appendix A.

3.2 Industrial Demand

The potential industries represented in this update are the same as those in the original study's largest wet gas spur line scenario, which calculates petrochemical and GTL demand based on sizing and siting "World Class" facilities. In this study, the GTL complex was sized to a 50,000 bpd capacity, which demand 464 MMcfd. LNG industrial demand is based on retrofit of the current, nearly 40-year old plant in Nikiski and expansion to 3.0 MMTPA, demanding 375 MMcfd. Fertilizer industry demand is based on renovation of the 40-year old Agrium-owned facility in Kenai, and would demand 145 MMscfd. The Agrium facility is currently mothballed due to dwindling supply from the Cook Inlet and associated high feedstock prices. LPG industry

¹ The 2006 Study considered industry at Fairbanks and the North Slope, but found that locating industry in South Central Alaska to be the most economically viable. Residential and commercial gas demand growth were the strongest and anchor customers such as the ConocoPhillips LNG terminal and the Agrium fertilizer plant on the Kenai Peninsular were then operational, providing a ready source of demand.

demand is calculated as the amount of extra propane and butane in the wet gas line, which is determined by the spur line volume and liquids content.

Table 1 shows the gas and NGL capacity and demand for the potential industries considered in this update report. Only the LPG industry capacity and demand differs from the 2006 Study. This Study updates ANS gas composition and reflects the "Rich Gas Case" composition described in the Alaska Gasline Inducement Act (AGIA) Request for Applications (RFA), released in July, 2007.

Table 1: Potential Industry Capacity and Demand for Natural Gas and NGL

Industry	Capacity	Demand as MMcf/d methane equivalent (NGL feedstock)
Fertilizer *	1.25 MMTPA ammonia, 1 MMTPA urea	145
LNG **	3.0 MMTPA	212
GTL	50,000 bpd low sulfur diesel	480
Petrochemical	1.27 MMTPA ethylene	122 (76,000 bpd ethane)
LPG	50,000 bpd LPG	78*** (41,000 bpd propane, 9,000 bpd butane)
Total Potential Demands		1,041.

* Assumes upgrade of the existing fertilizer plant

** Assumed expansion of the existing LNG facility at Nikiski

*** Under the "Lean Gas Case" composition described in the AGIA RFA, LPG capacity and demand would be reduced to approximately 24,000 bpd propane and 4,800 bpd butane, which is equivalent to 45 MMcf/d methane.

In both the 2006 Study and this update, it is recognized that pentanes will also be in the spur line gas stream, and will be separated out in South Central Alaska. Pentanes can likely be readily sold for blending into local gasoline, however their quantity and associated total value is quite small compared to the other gas stream components (i.e., approximately 1,400 bpd pentanes versus over 50,000 bpd LPG), thus pentanes are not further considered in this assessment.

3.3 Financial Assumptions

As in the 2006 Study, this update of industrial gas needs is market based and does not include analysis of gas price discounts or special incentives by the state to encourage in-state industrial development. Also as in the 2006 Study, it is assumed that, as a result of the integration of the South Central gas market with Canadian and Lower 48 gas markets, Alaskan gas prices will be based on Lower 48 gas prices adjusted for tariff. Thus, the price of natural gas in South Central Alaska is determined as the market price for natural gas at Henry Hub², minus the difference in estimated tariff rates between Henry Hub and South Central Alaska. In this update report, these

² This is the pricing point for North American natural gas futures on the New York Mercantile exchange. It is located in Erath, Louisiana.

differences are estimated to be \$2.51 and \$3.12 in the "Low" and "High" case scenarios, respectively.

All results presented in this update report are in 2007\$ unless specified otherwise. As in the original study, the financial analysis assumes the following for each industry:

- *Project Life* – 20 years. This is a common industrial project life.
- *Discount Rate* – 12% rate. This varies among industries and projects, and may be relatively low for industries with higher risk (e.g., GTL).
- *Federal and state taxes* – were assumed at the rates of 35% and 4.5% of taxable income, respectively.
- *Cost Adjustment* – to adjust for the higher costs in Alaska compared to the Lower 48, construction and operations costs were multiplied by 1.3 for South Central Alaska.
- *Cost of Capital (during construction)* – 6%.
- *Financing* – all projects were assumed to be equity financed as turn-key projects.

The financial analysis of each industry is designed to determine the netback value of the feedstock (i.e., dry natural gas, ethane, or propane) to each industry. Netback value represents the maximum price for natural gas and NGL that each industry can afford to pay given global price for products, transportation costs, capital and operating costs, discount rate, and taxes.

The industry-specific inputs to the financial analysis for capital and operating costs, and shipping costs are the same values used in the 2006 Study after adjustments based on changes in Producer Price Indices from 2005 to 2007, as published by the Bureau of Labor Statistics. Table 2, below, displays the updated cost assumption for each industry assessed – these costs were held constant in both the high and low market price scenarios.

Table 2: Cost Assumptions for Potential Industries (\$ millions)

Industry	Capital Costs	Low Price Scenario		High Price Scenario	
		Operating Costs	Shipping Costs	Operating Costs	Shipping Costs
Fertilizer *	\$257	\$316	\$55	\$589	\$57
LNG **	\$880	\$642	\$128	\$1,271	\$135
GTL	\$3,112	\$772	\$103	\$1,504	\$108
Petrochemical	\$2,993	\$722	\$80	\$1,046	\$82
LPG	\$844	\$440	\$66	\$740	\$69

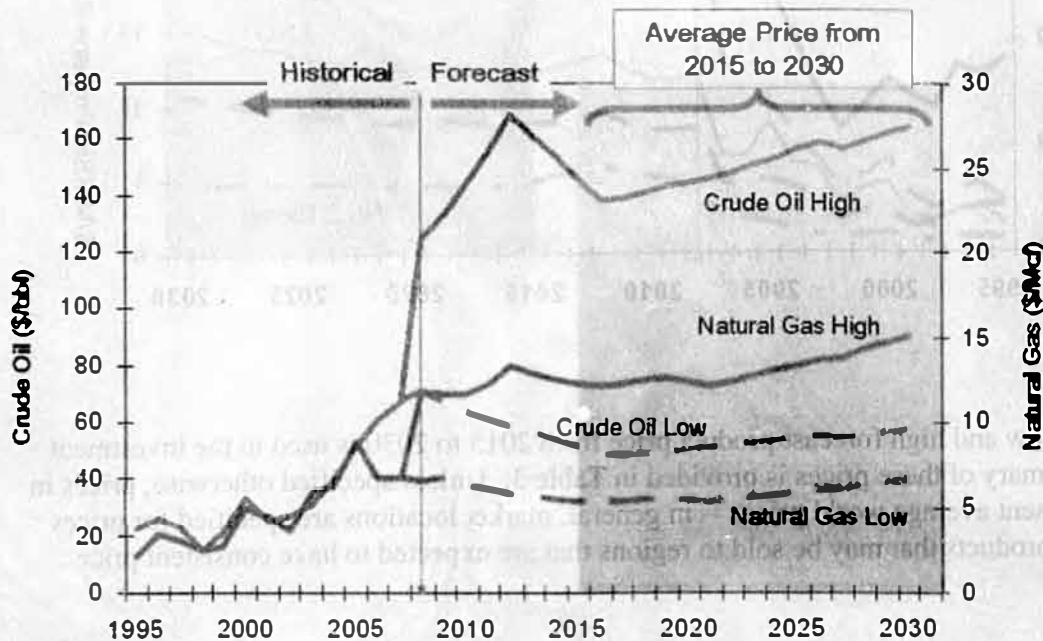
* Assumes upgrade of the existing fertilizer plant
 ** Assumed expansion of the existing LNG facility at Nikiski

4.0 Methodology

This analysis employs the same investment model adapted to each industry that was used in the 2006 Study. Input parameters include facility specifications (i.e., size, efficiency, etc.), production costs, and projected product prices on world markets. Model outputs include the netback value of gas to each industry. As an example, the value of gas to a fertilizer plant is calculated as the average annual price of fertilizer on the world market minus the average annual cost of transportation, and present value of combined capital and operating costs to convert Alaskan natural gas to a fertilizer.

For this update, model input parameters were changed to reflect increases in forecasted gas and oil prices, and related increases in the price of industrial products that would be produced from the modeled industries. Forecast natural gas and oil prices are based on the Energy Information Administration (EIA) forecasts published in the *Annual Energy Outlook 2008* as the “reference” case for Lower 48 prices. The EIA forecast prices for gas and oil are viewed by many energy analysts as conservative, thus this forecast is used as the “low” price scenario in this report. The June 3, 2008 futures prices of natural gas and crude oil on NYMEX for 2012 were used to represent a high price scenario in 2012, with the subsequent high-price scenario forecast through 2030, following the same annual percentage change as in the low price scenario. Historical and forecast prices of Lower-48 natural gas and crude oil are shown in Figure 1.

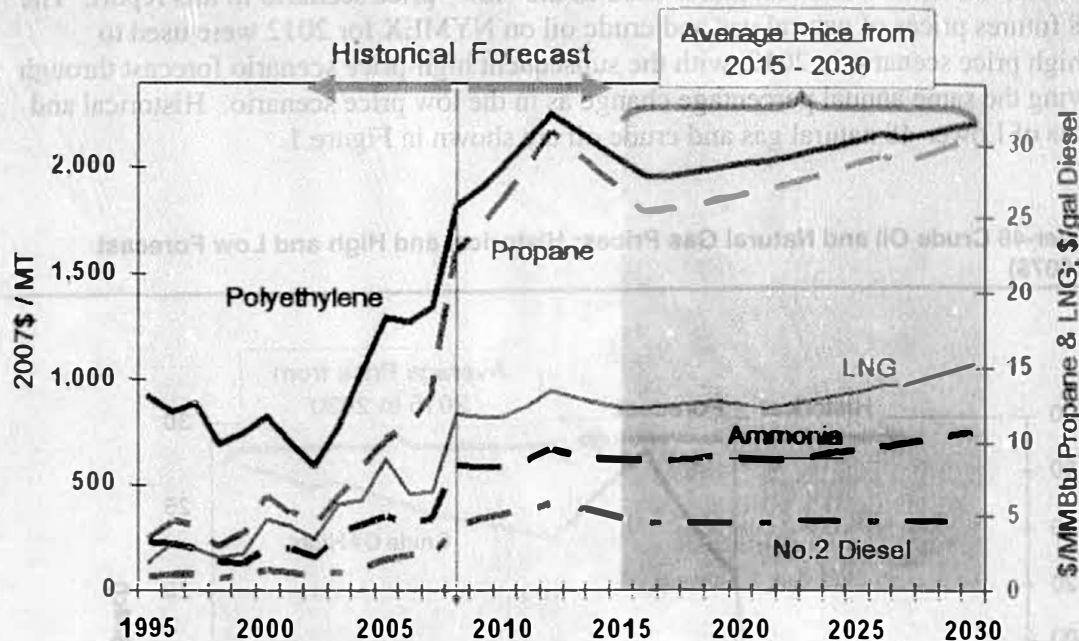
Figure 1: Lower-48 Crude Oil and Natural Gas Prices: Historical and High and Low Forecast Scenarios (2007\$)



As described in the assumptions discussed above, the price of natural gas in South Central Alaska was determined as the market price for natural gas at Henry Hub, minus the difference in estimated tariff rates between Henry Hub and South Central Alaska..

Forecast product prices for each of the modeled industries are based on their historical relationship with natural gas and crude. Historical natural gas prices have a tighter relationship with ammonia and LNG, thus high and low natural gas price forecasts are the basis of the ammonia and LNG price forecasts. Historical crude prices have a tighter relationship with polyethylene, propane, and diesel; thus high and low crude price forecasts are the basis of the product forecasts for petrochemical, LPG, and GTL industries. Figure 2 shows the high scenario forecast of product prices.

Figure 2: High Scenario Product Price Forecast for LNG, LPG, Polyethylene, Ammonia, and Diesel (2007\$)



The average low and high forecast product price from 2015 to 2030 is used in the investment model, a summary of these prices is provided in Table 3. Unless specified otherwise, prices in Table 3 represent average world prices -- in general, market locations are specified for prices representing products that may be sold to regions that are expected to have consistent price premiums.

Table 3: Average Forecast Prices (Model Input): 2015-2030

Commodity	Low Price	High Price
Natural Gas, Henry Hub (\$/MMBtu)	\$6.44	\$13.52
Natural Gas, SC Alaska (\$/MMBtu)	\$3.93	\$10.41
Crude Oil Price (\$/Bbl)	\$52.26	\$150.69
LPG (\$/ton)	\$453	\$1,305
Diesel, North America (\$/MMBtu)	\$11.47	\$33.08
Diesel, Japan (\$/MMBtu)	\$14.14 ^a	\$35.75 ^a
LNG, Southern California (\$/MMBtu)	\$6.09	\$13.17
LNG, Japan (\$/MMBtu)	\$7.05	\$16.74
Ammonia (\$/ton)	\$322	\$676
Polyethylene (\$/ton)	\$1,097	\$2,081

^a Based on the world crude oil forecast plus a \$0.37/gal premium in Japan based on average prices in 2007.

5.0 Industry Investment Analysis Results

5.1 Product Markets

Product markets were re-assessed for this update. Japan is identified as a potentially highly desirable market for Alaskan LNG, diesel from the GTL complex, and LPG. These products have been sold at a significant premium in Japan in recent years. Shipping costs from Alaska to Japan are roughly equivalent to, or less than other suppliers competing for the Japanese market. Potential markets assessed in this study are shown in Table 4 for each assessed product.

Table 4: Potential Markets for Alaskan Industrial Products

Product	Modeled Markets
Fertilizer	US West Coast, China, Japan
LNG	Japan, British Colombia, US / Mexico West Coast, China, Korea
GTL (ULSD)	US West Coast, BC, Japan
Petrochemical	US Gulf, Korea, China
LPG	US West Coast, China, Japan

The previous markets for Alaskan fertilizer, the US west coast and Asia, are good candidates for future markets. As indicated by the netback analysis shown below, Alaskan fertilizer, petrochemical and LPG industries value natural gas well-within, or above the range of forecasted natural gas market prices in South Central. This suggests favorable economics for these

industries, with flexibility in the regions their product may be sold. China and Korea are viewed as likely markets for petrochemical products, both of which are projected to have increasing demand. Price premiums in Japan make it a very desirable market for LPG. Combined with the relatively larger expected growth in LPG demand in China, the Asian market is viewed as a likely market for Alaskan LPG.

Based on the assumptions used in this analysis, Alaskan GTL and LNG industries may be relatively more sensitive to product prices than the other modeled industries. Under the "low" price scenario and associated assumptions, products from Alaskan GTL and LNG industries may require that sales be to regions that place relatively high premiums on their products (i.e., Japan), or their operation may cease to be economically favorable.

The relatively high capital investment required for the modeled GTL complex in conjunction with its relatively high sensitivity to market prices, and the greater risk associated with this less common technology, may make the development of this industry less desirable than some of the other industrial options.

5.2 Netback Results

Based on the assumptions of this updated analysis, the maximum value of natural gas for each of the assessed industries is shown in Table 5. Netback prices that are below the forecast range of South Central natural gas (i.e., the average forecast price for each scenario plus or minus \$0.50) suggest particularly risky investments based on the assumptions applied in this study.

Table 5: Netback price of Natural Gas and Associated Product Prices: 2015-2030

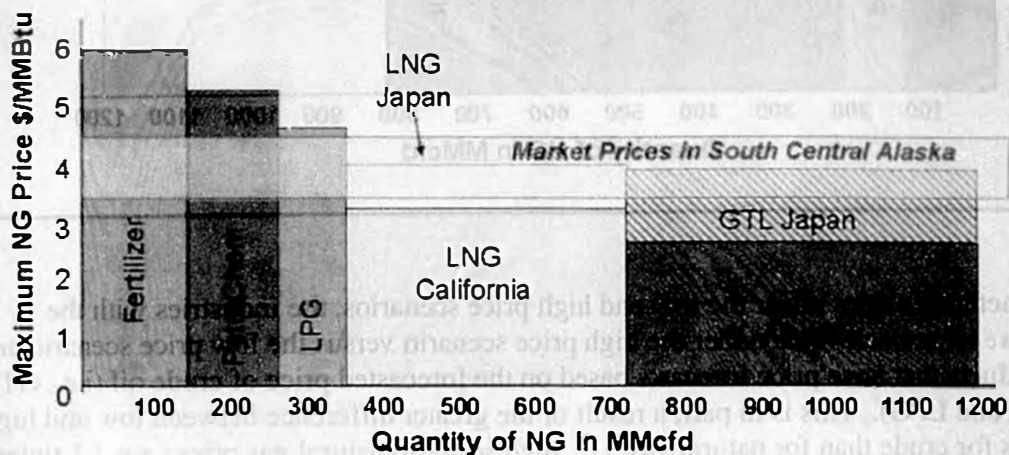
Industry	Low Price Scenario (SC NG Market Price: \$3.43 to \$4.43/MMBtu)		High Price Scenario (SC NG Market Price: \$7.76 to \$8.76/MMBtu)	
	Product Price	Netback (\$/MMBtu)	Product Price	Netback (\$/MMBtu)
Fertilizer *(Ammonia)	\$322 ton	\$5.87	\$676/ ton	\$13.45
LNG , Southern California	\$6.09/ MMBtu	\$3.24	\$13.17	\$9.63
LNG, Japans	\$7.05/ MMBtu	\$4.11	\$16.74/ MMBtu	\$12.87
GTL (Diesel), N. America	\$11.47/ MMBtu	\$2.45	\$33.08/ MMBtu	\$14.89
GTL (Diesel), Japan	\$14.14/ MMBtu	\$3.99	\$35.75/ MMBtu	\$16.43
Petrochemical	\$1,097/ ton	\$5.19	\$2,081. ton	\$20.72
LPG	\$453/ ton	\$4.65	\$1,305/ MMBtu	\$19.92

The two industries that have the lowest increase in netback under the high price scenario (i.e., LNG and fertilizer) have product price forecasts that are based on natural gas prices (which increase less in the high scenario than crude prices), in addition to relatively low capital

investment. In general, when market prices are relatively high, industries with greater capital investment benefit disproportionately more than industries with lower capital investment.

Figure 3 shows gas and NGL volumes as dry gas equivalents on a thermal basis on the x-axis, and the netback price on the y-axis, where netback price is maximum price of dry gas each of the assessed industries can pay while remaining economically viable under the modeled assumptions. The horizontal bar in Figure 3 represents the expected price range of South Central dry gas (i.e., the average low forecast price of \$3.93/MMBtu, plus or minus \$0.50). If South Central gas prices are higher than the maximum (i.e., netback) value for gas shown for a particular industry, then gas consumption from that industry will likely be severely curtailed, or may never develop.

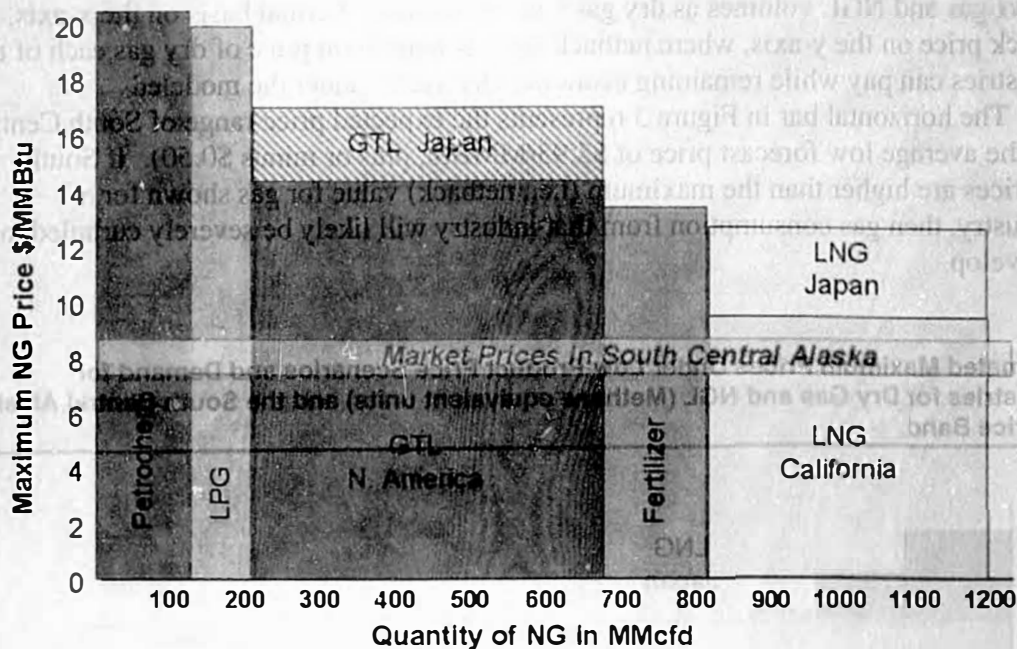
Figure 3: Estimated Maximum Prices Under Low Product Price Scenarios and Demand for Potential Industries for Dry Gas and NGL (Methane equivalent units) and the South Central Alaska Gas Market Price Band.



Source: SAIC

Figure 4 shows a similar graph the high market price scenario. In this case, the horizontal bar represents the expected price range of South Central dry gas with the average high forecast price of \$8.26/MMBtu, plus or minus \$0.50.

Figure 4: Estimated Maximum Prices Under High Product Price Scenarios and Demand for Potential Industries for Dry Gas and NGL (Methane equivalent units) and the South Central Alaska Gas Market Price Band.



Source: SAIC

In comparing netback values under the low and high price scenarios, the industries with the greatest increase in netback value under the high price scenario versus the low price scenario are those with products that have price forecasts based on the forecasted price of crude oil (i.e., GTL, petrochemical, and LPG). This is in part a result of the greater difference between low and high forecast prices for crude than for natural gas, i.e., high scenario natural gas prices are 2.1 times greater than low scenario prices, while high forecast prices of crude oil are 2.88 times greater than low forecast prices, as shown in Figure 1.

Because these analyses were conducted using assumptions that are inherently uncertain (i.e., projections of average market prices), none of the maximum price values should be considered accurate. However, the relative ranking of the industrial netback values in the South Central Alaska locations is not likely to change with modest assumption adjustments, with the possible exception of GTL. GTL is more sensitive to assumption modifications due to the larger gas demand and the higher uncertainty over project costs. The assumptions used in the GTL industry assessment are considerably more speculative than in other industries as a result of the uncertainty surrounding newer GTL technology and the still-emerging ultra-low-sulfur diesel fuel market.

6.0 Recommendations

There are many options and combinations of options that may have potential for Alaska with the development of ANGP and a spur pipeline. The relative merits of the options are complex and the long-term price forecasts for natural gas and oil and petroleum products on the world market always have a significant degree of uncertainty. Potential industries could be assessed on more detailed levels, with probabilistic analyses that account for cost and market risk to help provide additional insight into the complex interactions of options and economic benefits. Ultimately, these detailed analyses will likely be performed by serious investors. However, some over-reaching concepts are applicable to multiple industries and their integration, and thus may be best studied at an integrated level. Recommended integrated studies, include the following:

- A large-capacity spur pipeline will impact the design and operation of ANGP and could have significant economic impacts on that project. These issues were not analyzed in this study and could be more fully understood by running sensitivities to determine the impact of different-capacity spur pipelines on the value of ANGP.
- The uncertainties surrounding the completion of ANGP and consequently the spur pipeline are well understood. Alternative supply options exist, such as a smaller capacity bullet line from the ANS to Central Alaska. A comparative assessment of the alternative supply options would determine the costs and benefits of each supply option and help identify the optimal strategy for meeting natural gas demand.
- The potential location of various industries at North Slope or Central Alaska (e.g., GTL or petrochemical) may affect the desirability of further industry development in South Central. If industrial development at North Slope or Central Alaska is pursued further, the effects of industries located closer to the wellhead on state-wide industrial development may warrant further assessment.
- The results of this study suggest that the state of Alaska should explore the level of industry interest in investing in Alaska.

Appendix A: Gas Composition of a Dense Phase, Wet Spur Line

The spur line will provide a means to deliver a portion of the stranded natural gas at Alaska North Slope to a market. While the primary component of this gas is methane, it also contains a significant amount of natural gas liquids (NGL), i.e., ethane, propane, butane, and pentane. The economics of sending the stranded Alaska North Slope natural gas to market may depend on the inclusion of NGL because these components have a higher value per volume than methane.³ A non-traditional, high-pressure pipeline allows transport of NGL without development of a separate liquid phase in the line, avoiding the slug flows that occur when a low pressure line includes more NGL than found in dry gas. The pressure of a wet gas line is set based on the NGL composition.

The composition of natural gas components in a wet gas line can vary greatly depending on:

- **Gas source.** There are several different potential sources of natural gas at Alaska North Slope, each source has a different proportion of methane and NGL.
- **Volume of wet gas from which NGL are separated.** The recovered NGL are used to enrich the South Central Spur line.
- **Percent recovery of NGL.** This is determined by the separation technology used for enriching the Spur and used to remove NGL at the end of the Spur (i.e., Anchorage/Nikiski).

This update assesses each of the two gas compositions described in the Alaska Gasline Inducement Act (AGIA) Request for Applications (RFA), released in July, 2007. Separation efficiency assumptions are based on straddle separator plant efficiencies for recently designed plants in Canada, which have 95% separation efficiencies of ethane, and essentially 100% separation efficiencies of all other NGL. Based on recent designs, extraction of individual NGL from the liquid stream is assumed to be 100%.

The volume of gas from which NGL are separated is assumed to be the volume from which sufficient ethane would be removed to enrich the spur line with enough ethane to meet the demand of a world-class ethylene plant that uses ethane as a sole feedstock (i.e., 70,000 to 80,000 bpd ethane). The volume of raw gas that is transferred to the spur pipeline without processing by the straddle separator is assumed to be the volume that would allow the final spur line methane output to meet the projected dry gas demand for residential, commercial, and power sectors in addition to an industrial GTL complex. The propane and butane associated with the gas needed to meet the ethane and methane demand is the supply available for an LPG industry.

Calculations of spur pipeline composition are provided for both the "Rich" and "Lean" gas cases delineated in the AGIA RFA. Assumed demand includes South Central residential, commercial,

³ Michael Baker, Jr., Inc. 2005. Transport of North Slope Natural Gas to Tidewater. Submitted to the Alaska Natural Gas Development Authority (ANGDA), April, 2005.

and power sectors (a combined demand estimated to be 0.26 Bscfd), in addition to continued demand from the Agrium fertilizer plant, expansion of the ConocoPhillips LNG facility, and new development of GTL, petrochemicals, and LPG industries (a combined demand estimated to be 1.18 Bscfd).

Table A1 shows calculations of spur pipeline composition under the Lean Gas Case, in which 930 MMscfd is processed by a straddle plant separator with an ethane removal efficiency of 95%, and 100% removal efficiency of other NGL. Separated NGL are added as enrichment to a 1.4 Bcfd gas spur pipeline. This entire stream is processed by a second straddle separator in Anchorage/Kenai with efficiencies that are the same as those of the first straddle plant.

Table D1: Lean Gas Case, Spur line gas composition and volume.¹ (Assumes ideal gas behavior at 60 F and 14 psia)

Raw Gas Component	Raw Gas* Mole %	1st Straddle Input (930 MMscfd)		1st Straddle NGL Output to Spur		Total Spur Input**		2nd Straddle NGL Output	
		MMscfd	bpd	MMscfd	Bpd	MMscfd	bpd	MMscfd	Bpd
Methane	89.90	836	NA	NA	NA	1,169	NA	0	NA
Ethane	5.80	54	60,666	51	32,150	127	79,457	120	75,484
Propane	1.70	16	26,019	16	10,038	38	24,070	38	24,070
n-Butane	0.10	1	2,254	1	608	2	1,459	2	1,459
i-Butane	0.20	3	4,713	2	1,387	4	3,325	4	3,325
Pentanes	0.10	1	3,189	1	723	2	1,733	2	1,733

* Raw gas mole % based on AGIA RFA, 2007.

** Total spur pipeline input calculated as 1st straddle output plus 1.30 Bcfd gas directly from the main pipeline.

These spur line inputs and straddle plant efficiencies yield roughly 75,000 bpd ethane, meeting the needs of a world class ethylene plant. This line would also supply roughly 25,500 bpd of propane and butane for an LPG industry, and 1,700 bpd pentanes for sale to other users, i.e., for blending into gasoline.⁴ In addition, the spur line would yield approximately 1.2 Bcfd dry gas to meet the dry gas demand of the South Alaskan residential, commercial, power and industrial sectors.

Table A2 shows calculation of spur pipeline composition under the Rich Gas Case scenario, in which 450 MMscfd is processed by a straddle plant separator with an ethane removal efficiency of 95%, and 100% removal efficiency of other NGL. Separated NGL are added as enrichment to a 1.4 Bcfd spur pipeline. This entire stream is processed by a second straddle separator in Anchorage/Kenai with efficiencies that are the same as those of the first straddle plant.

⁴ Pentane is also referred to as "natural gasoline" because it is a major component of gasoline.

Table A2: Rich Gas Case, Spur line gas composition and volume.¹ (Assumes ideal gas behavior at 60 F and 14 psia)

Raw Gas Component	Raw Gas* Mole %	1st Straddle Input (450 MMscfd)		1st Straddle Output to Spur		Total Spur Input**		2nd Straddle NGL Output	
		MMscfd	bpd	MMscfd	Bpd	MMscfd	bpd	MMscfd	Bpd
Methane	86.40	389	NA	0	NA	1,175	NA	0	NA
Ethane	7.10	32	20,046	30	19,043	127	79,626	121	75,645
Propane	3.60	16	10,286	16	10,286	65	41,373	65	41,373
n-Butane	0.30	1	883	1	883	5	3,552	5	3,552
i-Butane	0.40	2	1,342	2	1,342	7	5,397	7	5,397
Pentanes	0.10	0	350	0	350	2	1,406	2	1,406

* Raw gas mole % based on AGAI RFA, 2007.

** Total spur pipeline input calculated as 1st straddle output plus 1.36 Bcfd raw gas.

These spur line inputs and straddle plant efficiencies yield roughly 76,000 bpd ethane, meeting the needs of a world class ethylene plant. This line would also supply roughly 50,000 bpd of propane and butane for an LPG industry, and 1,400 bpd pentanes for sale to other users, i.e., for blending into gasoline.⁵ In addition to the NGL streams, the spur line would yield approximately 1.2 Bcfd dry gas to meet the demand for the South Central Alaskan residential, commercial, power, and industrial sectors.

⁵ Pentane is also referred to as "natural gasoline" because it is a major component of gasoline.

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Third Special Session
Twenty-Fifth Legislature

Carlson Center, Fairbanks Alaska
Friday June 13, 2008
10:00-5:00 p.m.

Joint Meeting AGENDA

Presentations: Review of AGIA Findings and Determination; Natural Gas Pipeline Project as proposed by TransCanada Alaska Company, LLC and Foothills Pipelines Ltd. (TC Alaska) to the State of Alaska.

Administration

➤ -AGIA Training Strategic Plan

Clark "Click" Bishop, Commissioner, DOL
Guy Bell, Administrative Services Director, DOL

➤ Employment Modeling

Conrad Mulligan, Senior Scientist for ARCADIS

➤ Infrastructure Needs for an Alaska Gas Pipeline Project

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➤ Explorer View

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Testimony: By Invitation
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Friday June 13, 2008

10:00-5:00 p.m.

Joint Meeting AGENDA

Presentations: Review of AGIA Findings and Determination; Natural Gas Pipeline Project as proposed by TransCanada Alaska Company, LLC and Foothills Pipelines Ltd. (TC Alaska) to the State of Alaska.

Administration

➤ -AGIA Training Strategic Plan

Clark "Click" Bishop, Commissioner, DOL
Guy Bell, Administrative Services Director, DOL

➤ Employment Modeling

Conrad Mulligan, Senior Scientist for ARCADIS

➤ Infrastructure Needs for an Alaska Gas Pipeline Project

Frank Richards, Deputy Commissioner, DOT

➤ Explorer View

Kevin Banks, Acting Director, Division of Oil & Gas, DNR

Testimony: By Invitation
Teleconference

ALASKA STATE LEGISLATURE

Senator Charlie Huggins, Chair
Senate Special Committee on Energy
State Capitol, Room 119
Juneau, AK 99801
Phone: 465-3878
Fax: 465-3265



Representative John Harris, Chair
House Rules Subcommittee on AGIA
State Capitol, Room 208
Juneau, AK 99801
Phone: 465-4859
Fax: 465-3799

Third Special Session
Twenty-Fifth Legislature

Carlson Center, Fairbanks Alaska
Thursday June 12, 2008
10:00-5:00 p.m.

Joint Meeting AGENDA

Presentations: Review of AGIA Findings and Determination; Natural Gas Pipeline Project as proposed by TransCanada Alaska Company, LLC and Foothills Pipelines Ltd. (TC Alaska) to the State of Alaska.

INSTATE GAS

➤ -AK GASLINE PORT AUTHORITY

Bill Walker, Project Manager & General Counsel
Craig Richards, Attorney

➤ AK NATURAL GAS DEVELOPMENT AUTHORITY

Harold Heinze, ANGDA CEO

➤ ENSTAR NATURAL GAS CO.

Curtis Thayer, Director Corporate & External Affairs
Gene DuBay, Continental Energy Systems,
Senior Vice President & COO
Andrew White, Manager, Business Development &
Revenue Forecasting

Testimony: By Invitation
Teleconference

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