ALASKA LEGISLATURE COMMITTEE FILES 2007-2008 HRLS 12314

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 th 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.

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"
  - More ports of entry
  - More air freight traffic
  - Higher background traffic
  - More pavement at risk
  - "Just in time" delivery approach likely

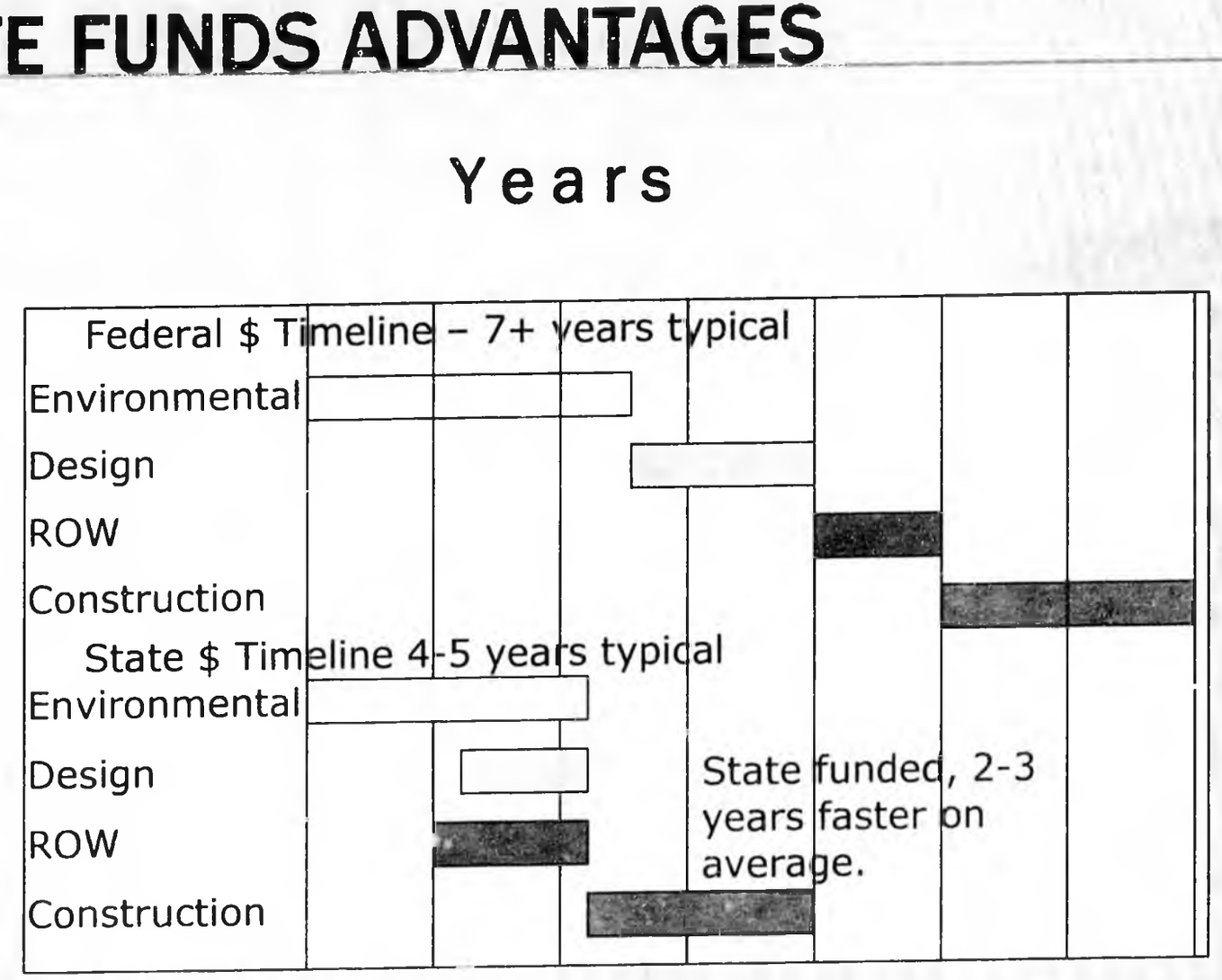
WHY NOW?

- 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

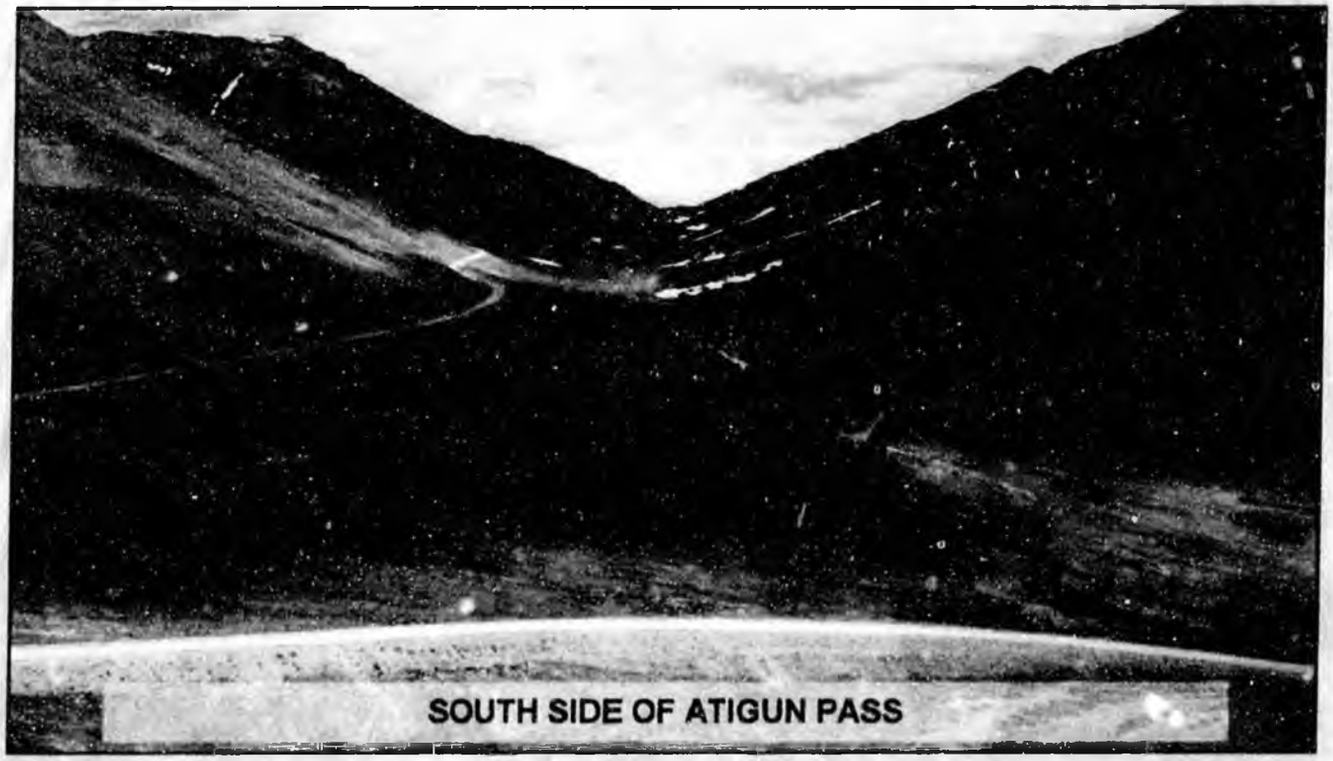
- Insufficient Federal Highway Funds and Timeline for Federal Projects
- Don't Want Roads Under Construction During Gasline Construction
- Projects will be Training Ground for Trades Needed for Gasline
- Reduce Accidents / Save Lives

STATE FUNDS ADVANTAGES



KEY CHOKEPOINTS

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



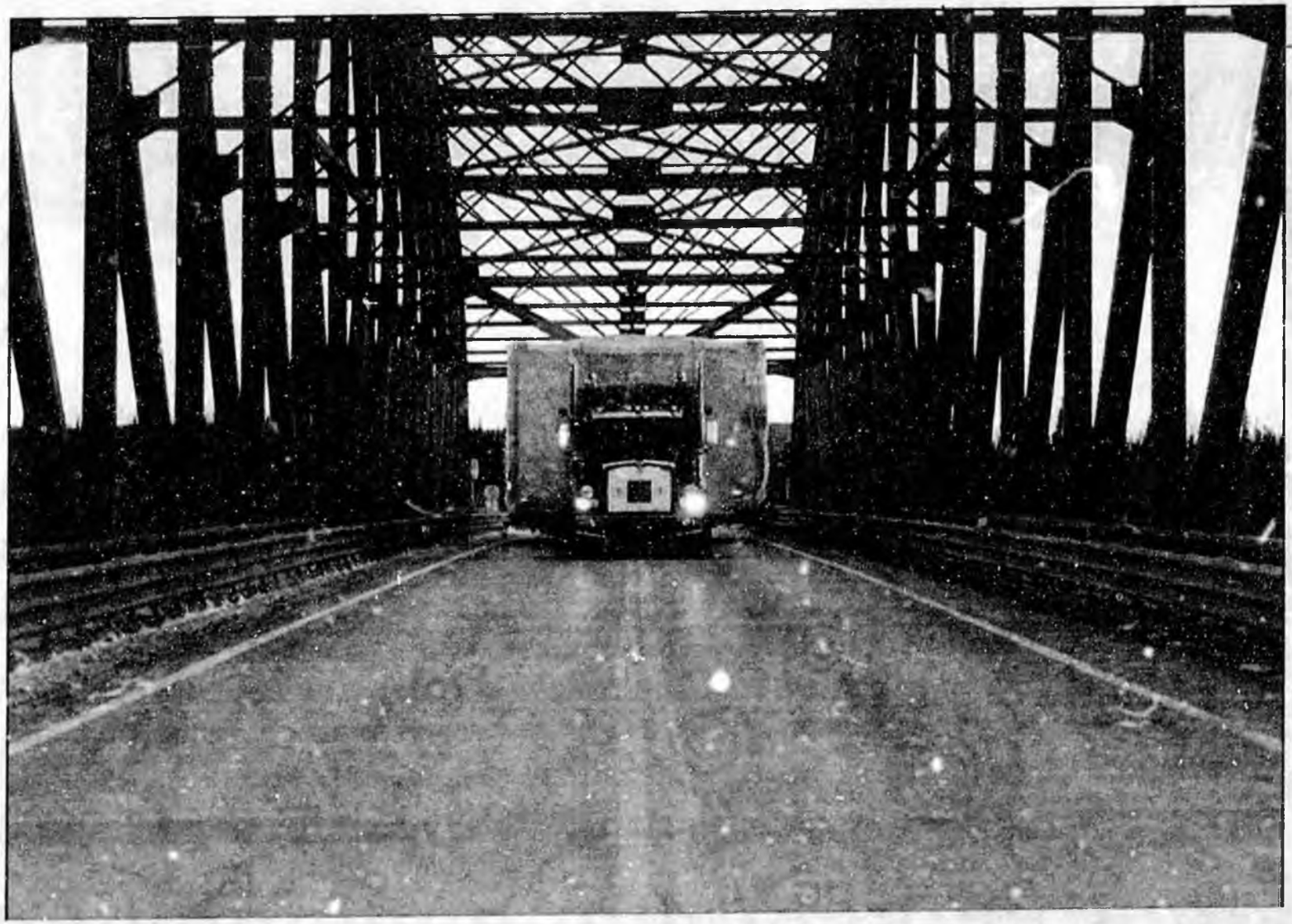
SOUTH SIDE OF ATIGUN PASS

EXAMPLE OF LIMITING BRIDGE
GERSTLE RIVER - ALASKA HIGHWAY

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

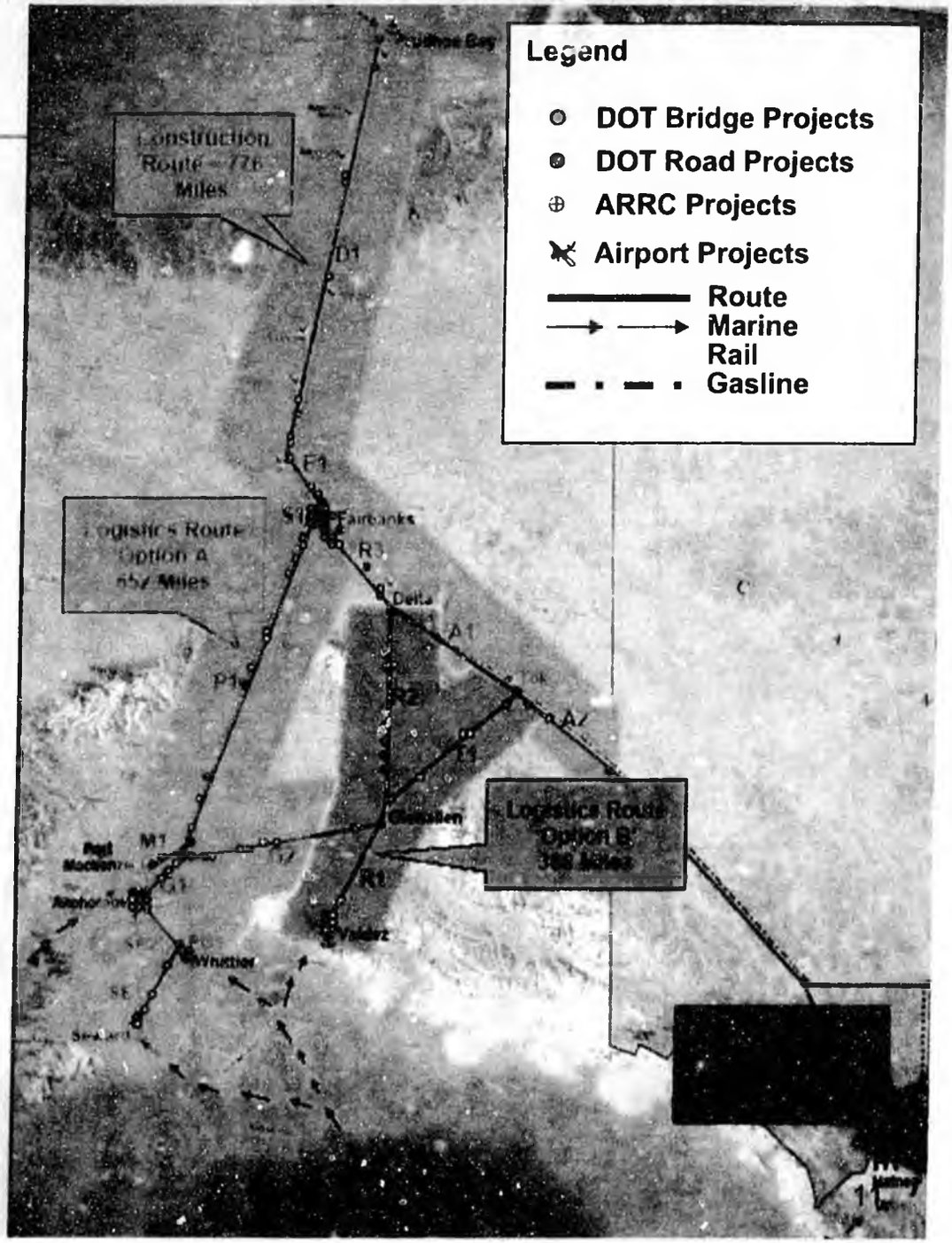
GAS PIPELINE TRANSPORTATION CORRIDOR DESCRIPTION

- 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

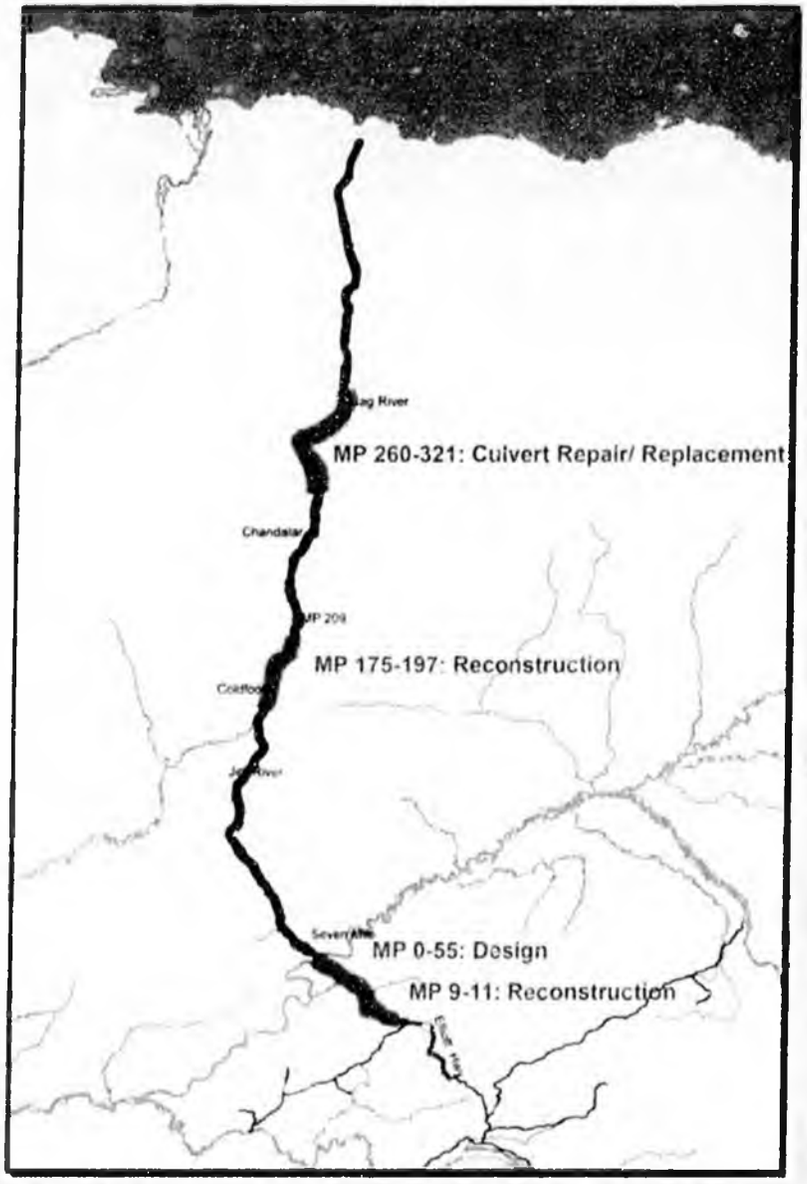
Initial $100M Request

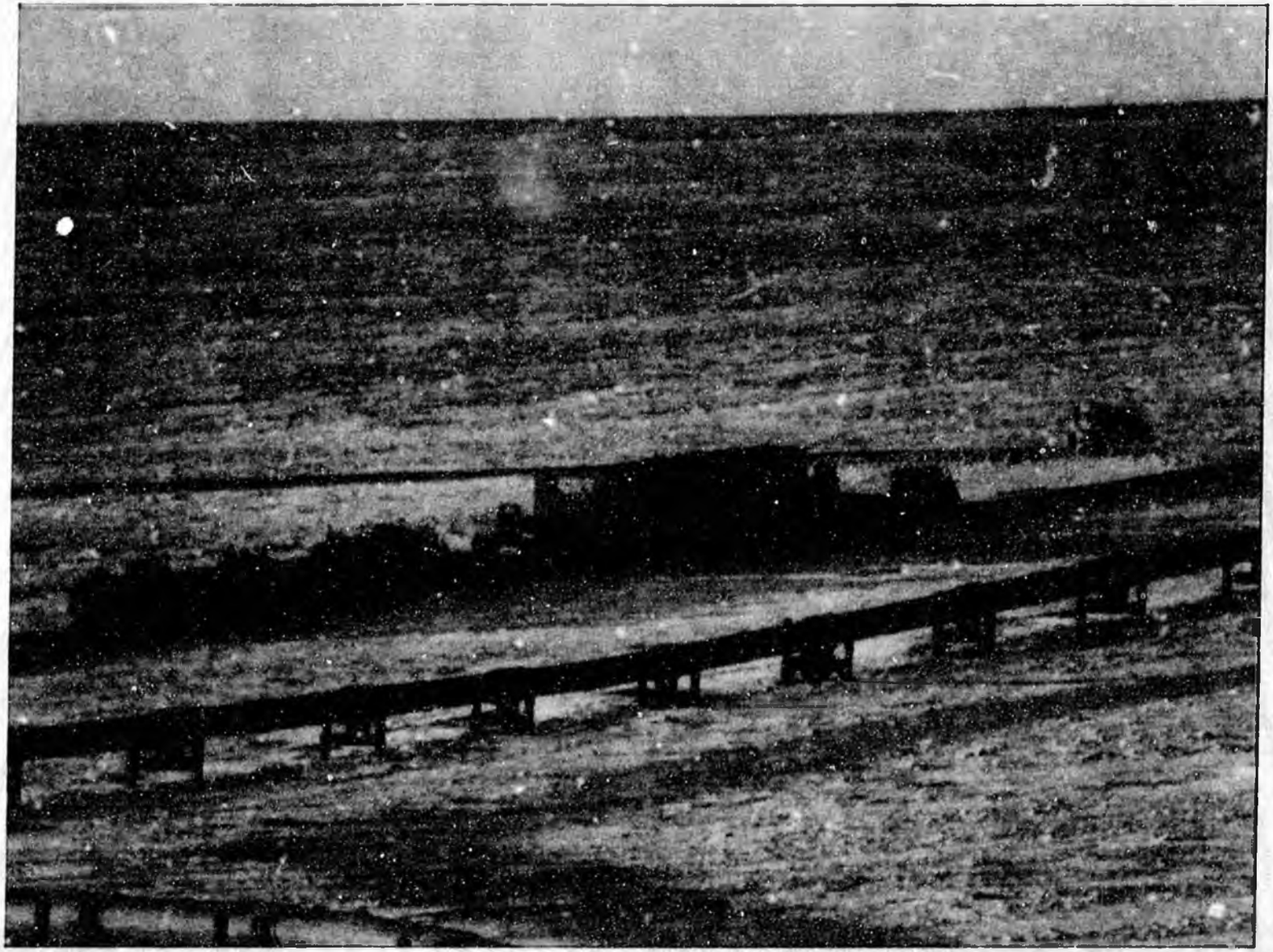
Construction $75.5M

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

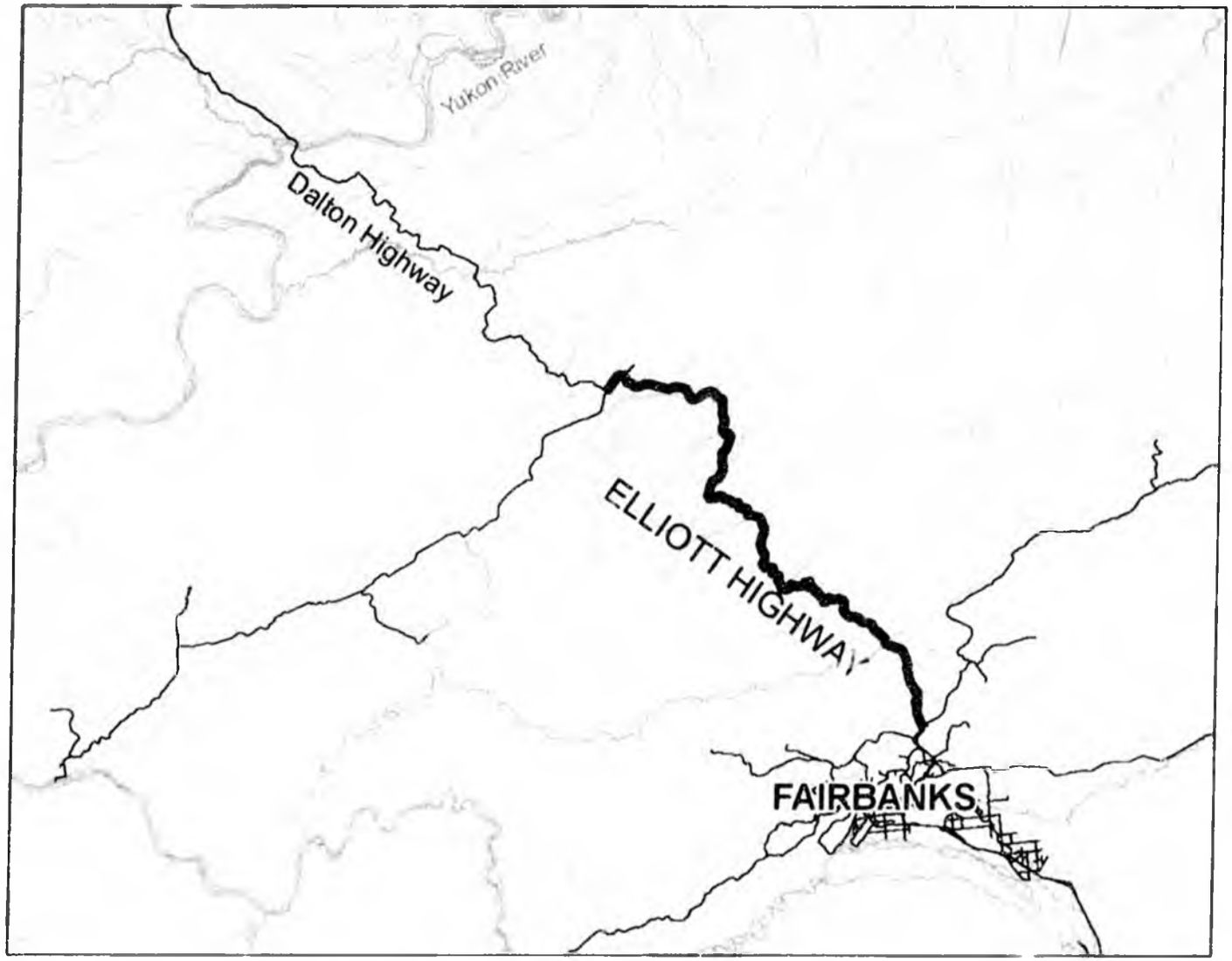
Design $24.5M

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





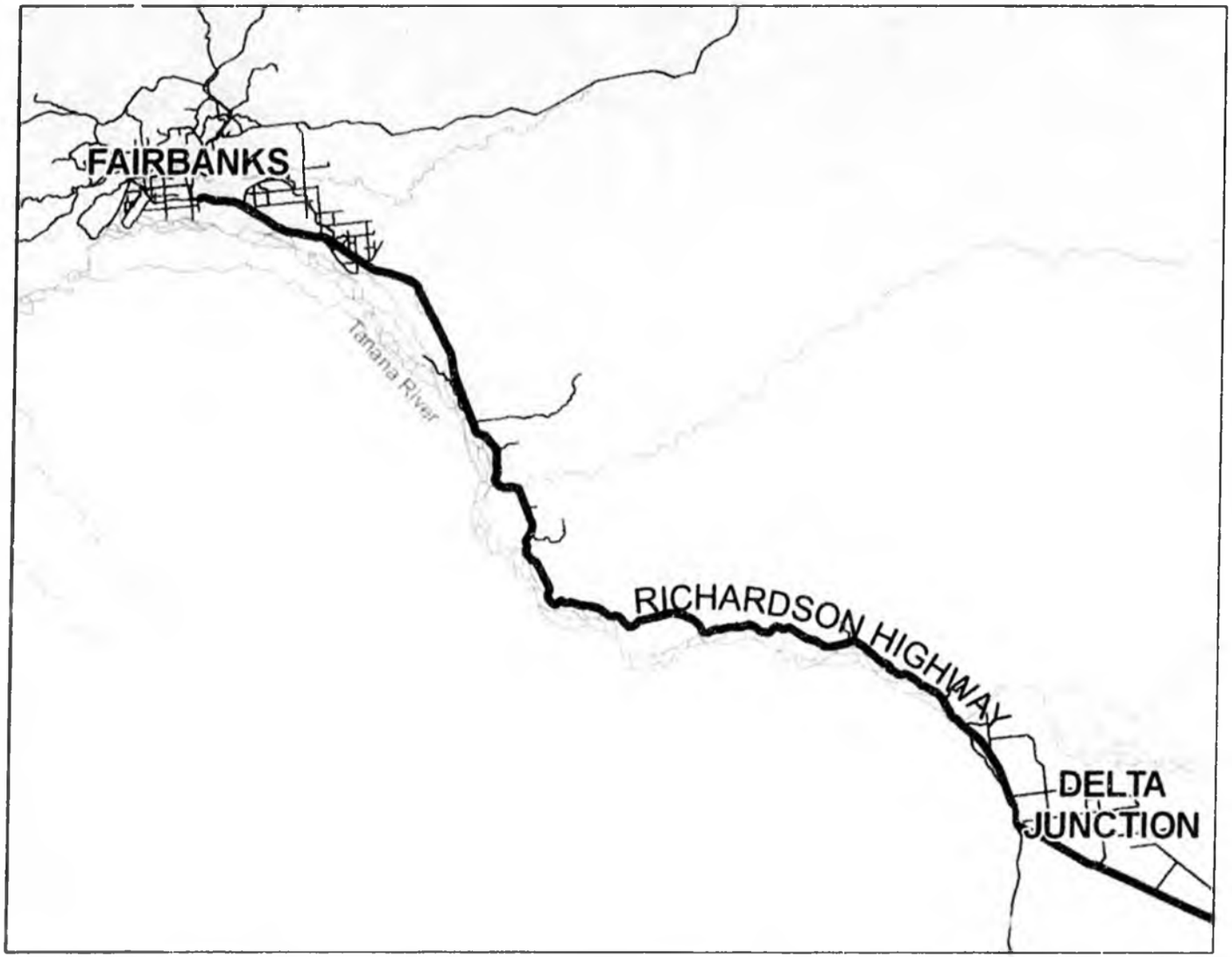
ELLIOTT HWY CORRIDOR



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

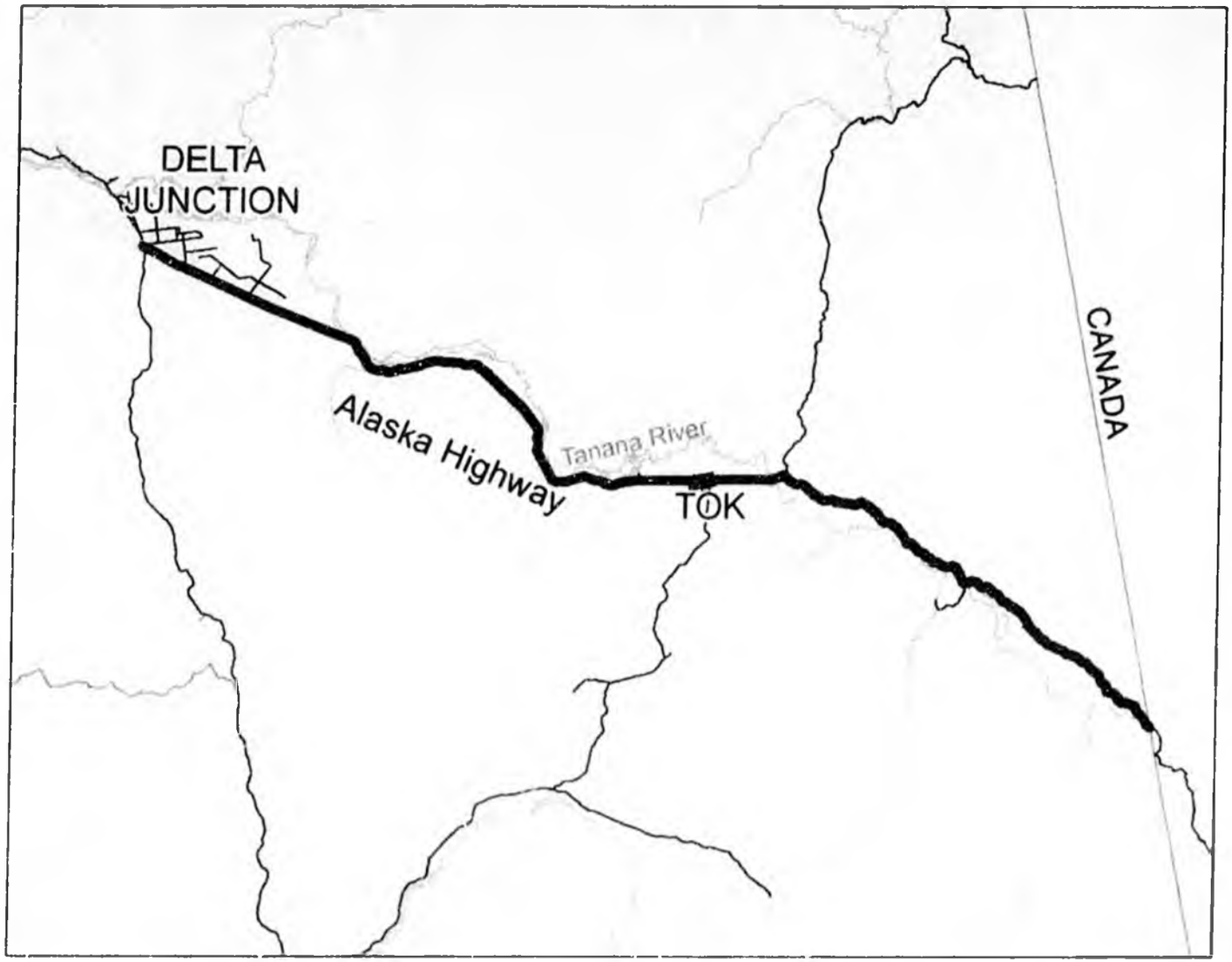
RICHARDSON HWY CORRIDOR



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

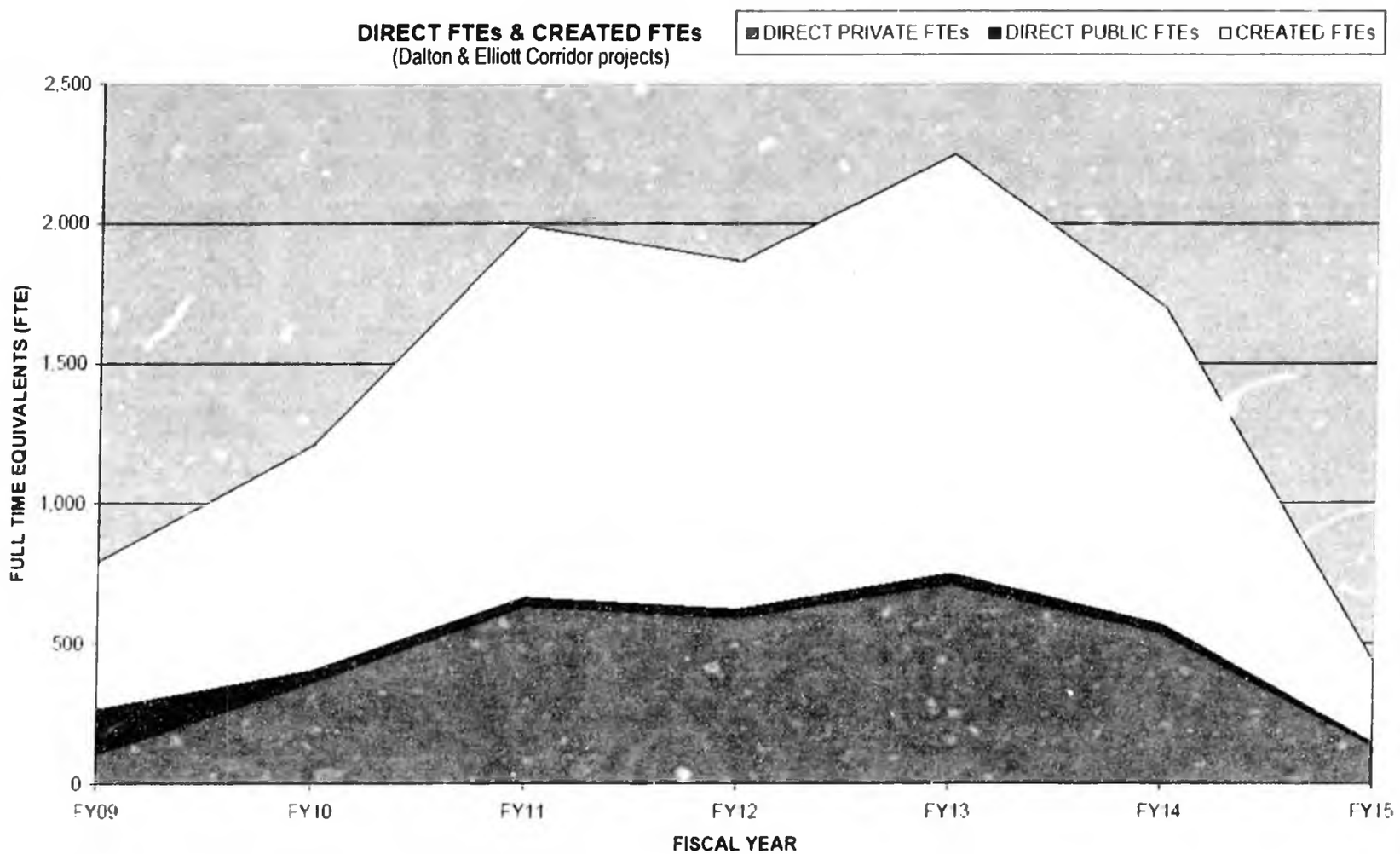
- Full time coordinator in place
- Key work identified (bridges, passing lanes, highway reconstruction)
- Federal funded projects underway
- GO bond projects – November election
- Started Conversations with Prospective Builders

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



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

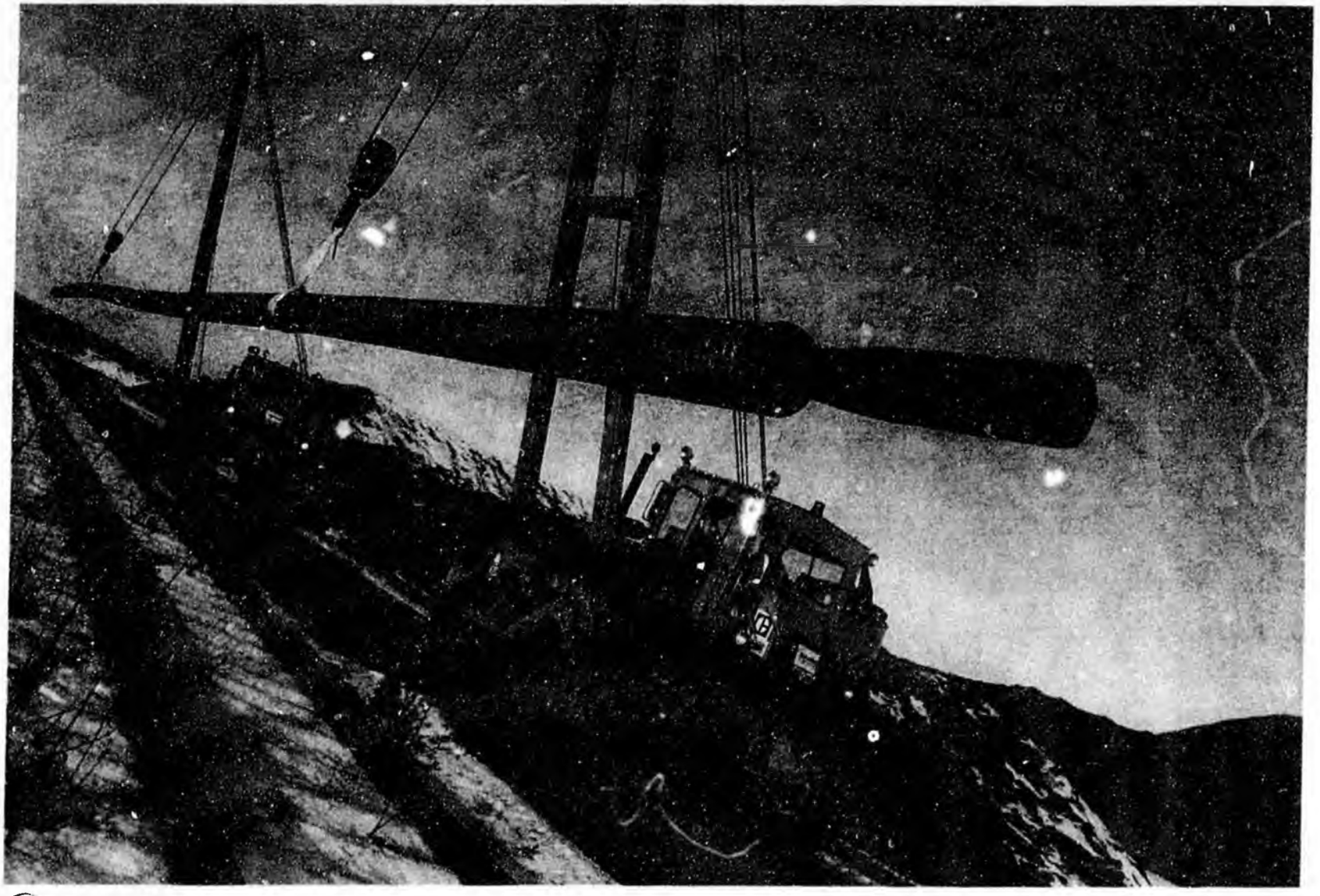
- Size and weight issues
- Extra maintenance and operations support during construction
- Safety and law enforcement
- Aviation needs
- ROW for TC Alaska
- ROW for Bullet Line
  - Denali Park and ANILCA
- Construction Impact on Tourism

QUESTIONS

Contact:

Frank Richards, P.E.
Deputy Commissioner
Alaska DOT&PF
(907) 465-3900
frank.richards@alaska.gov

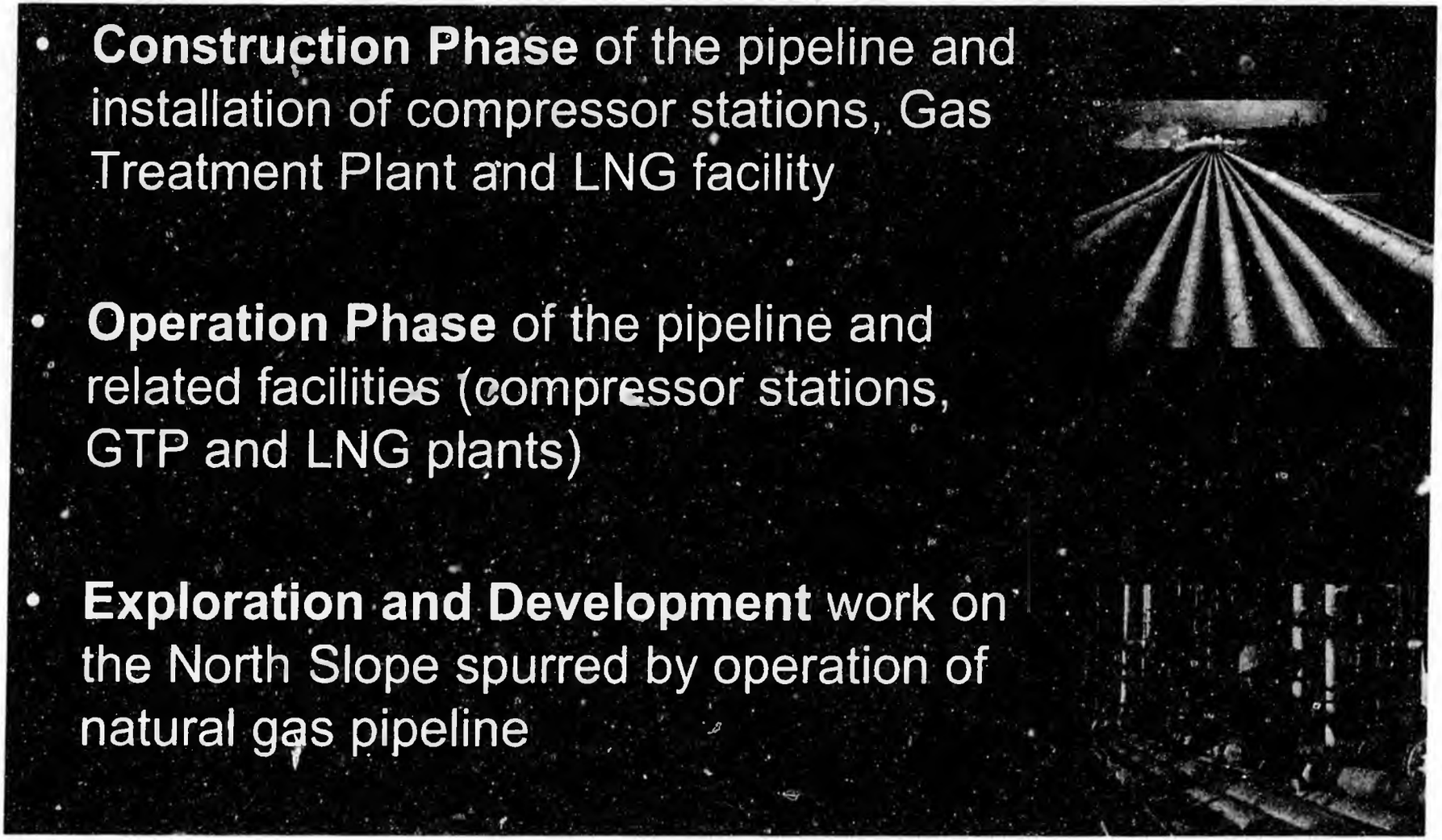
Modeling of Short- and Long-Term Employment Generated by Construction and Operation of an Alaska Natural Gas Pipeline Project



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

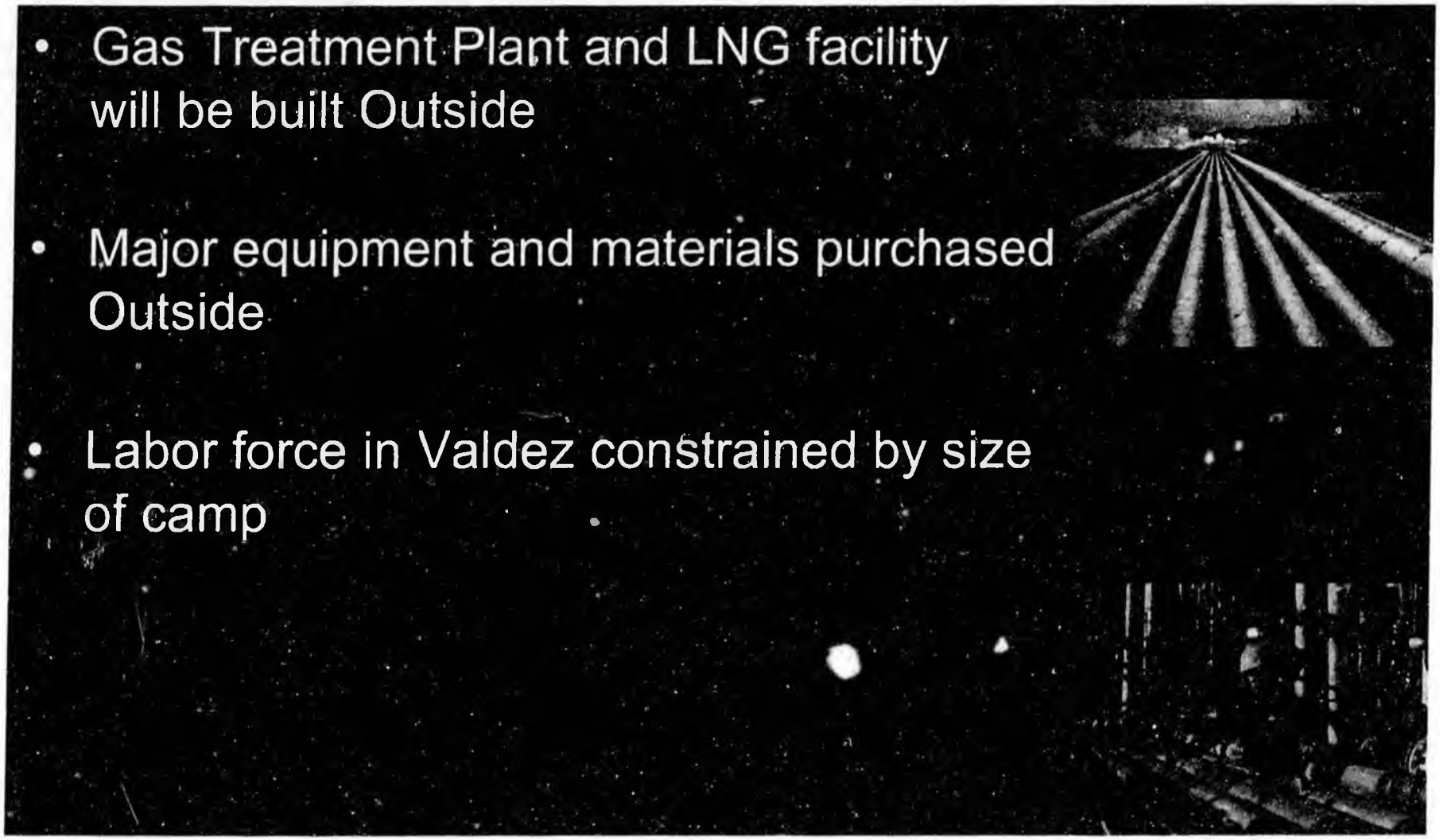
Sources of Data/Model Used

- 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



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

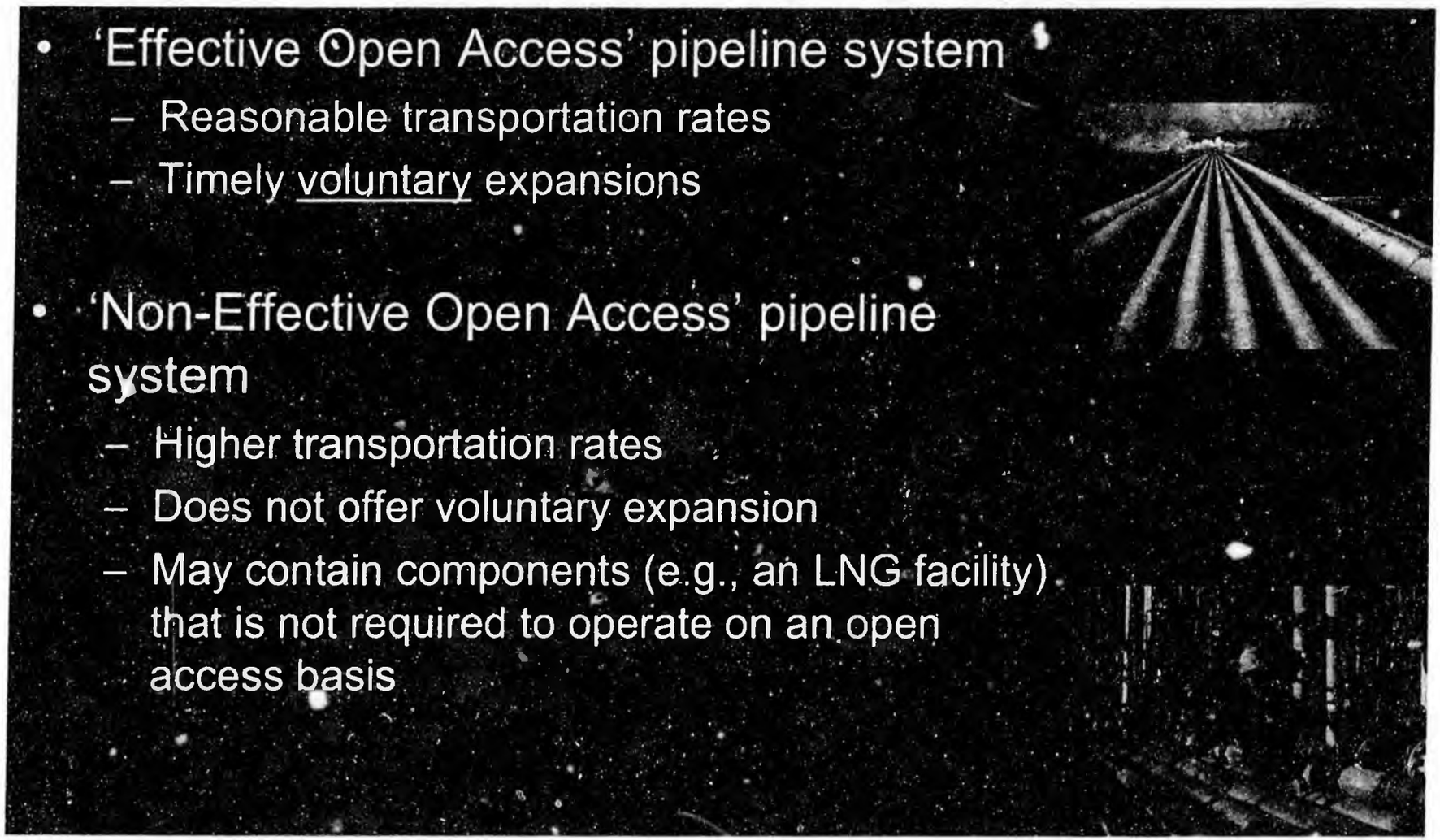
- LNG option: ~600 operations jobs in Alaska
  - ~200 jobs on the pipeline and at GTP
  - ~400 jobs at LNG plant in Prince William Sound

E&D Employment: Scenario Development

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

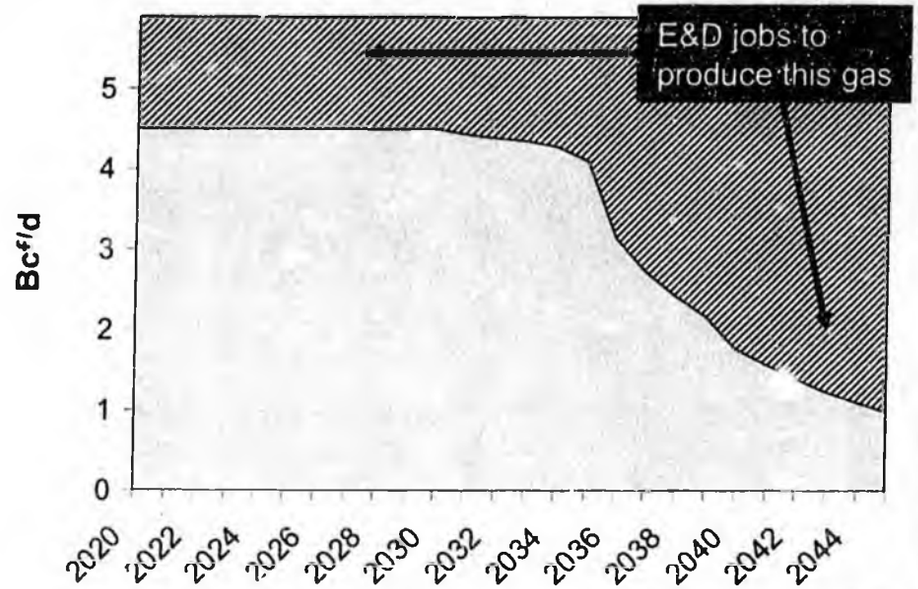
ARCADIS

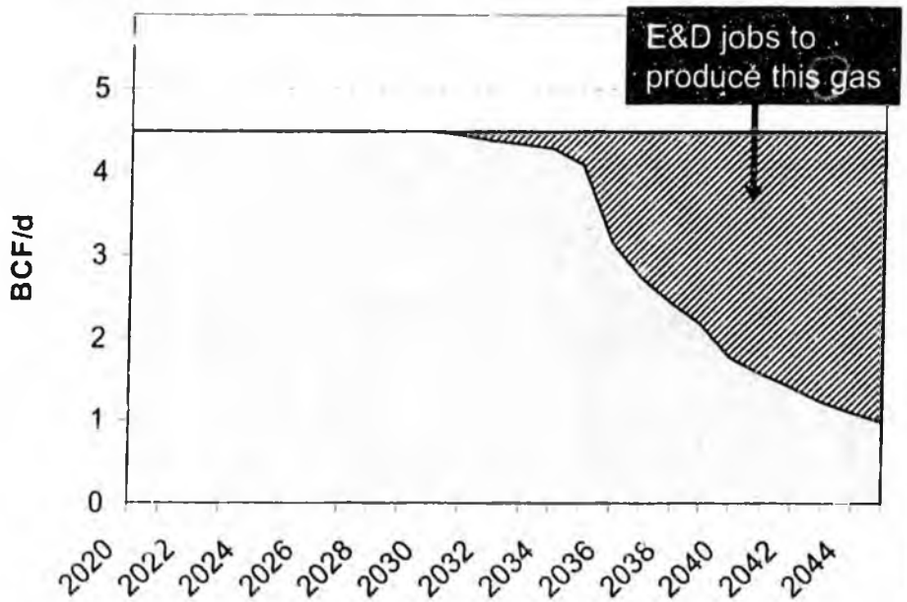
E&D Employment: Scenario Development



- '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

E&D Employment: Scenarios

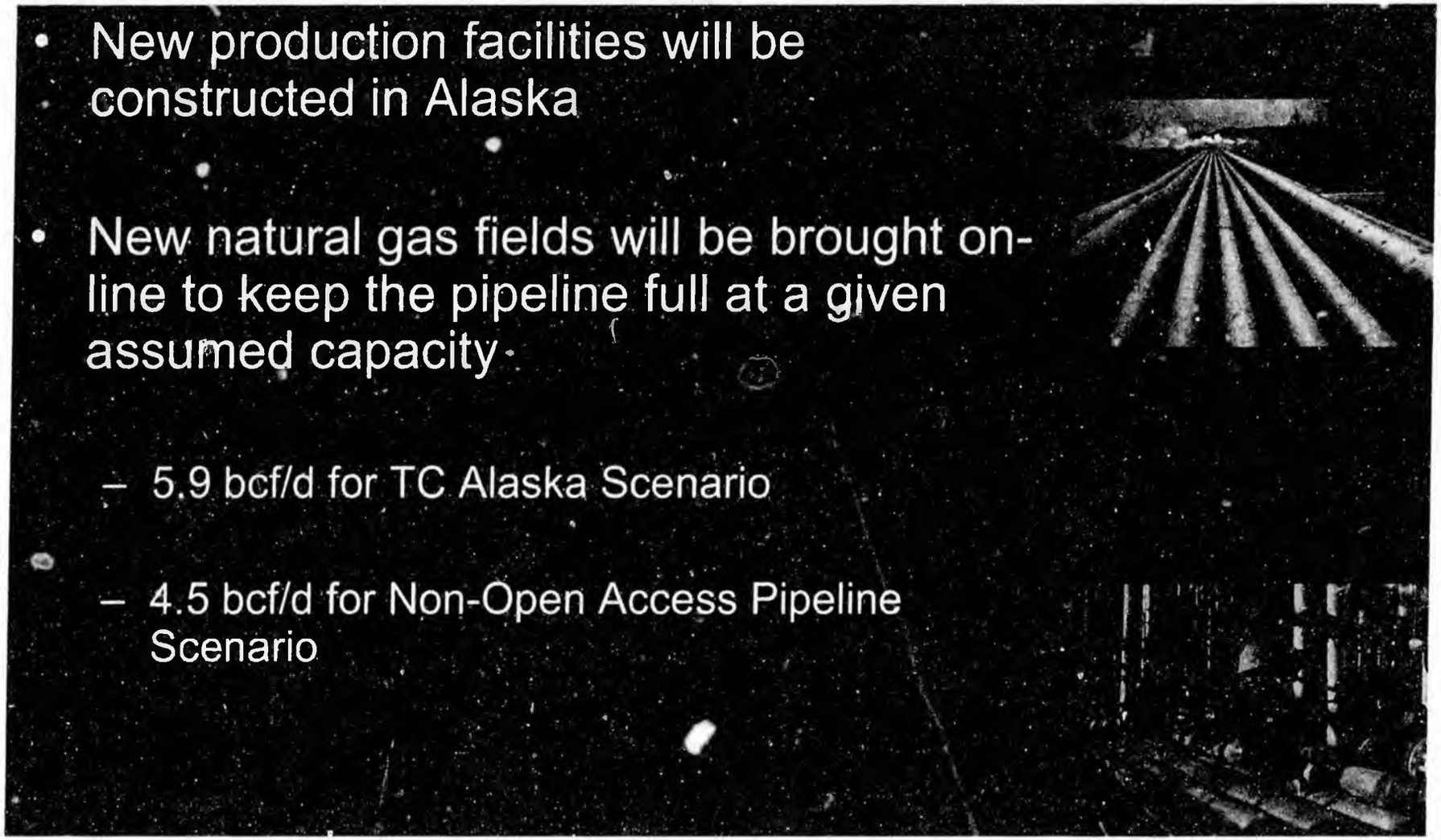




- TC Alaska Scenario
  - Offers 'Effective Open Access'
  - Capacity expansions as demanded + Reasonable tariffs = Favorable explorer economics = Aggressive E&D activity
- 'Non-Effective Open Access' Scenario
  - No capacity expansion
  - No new natural gas production (or E&D work) until current fields fall off plateau

ARCADIS

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

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

An Explorer's View of Gas Pipeline Issues

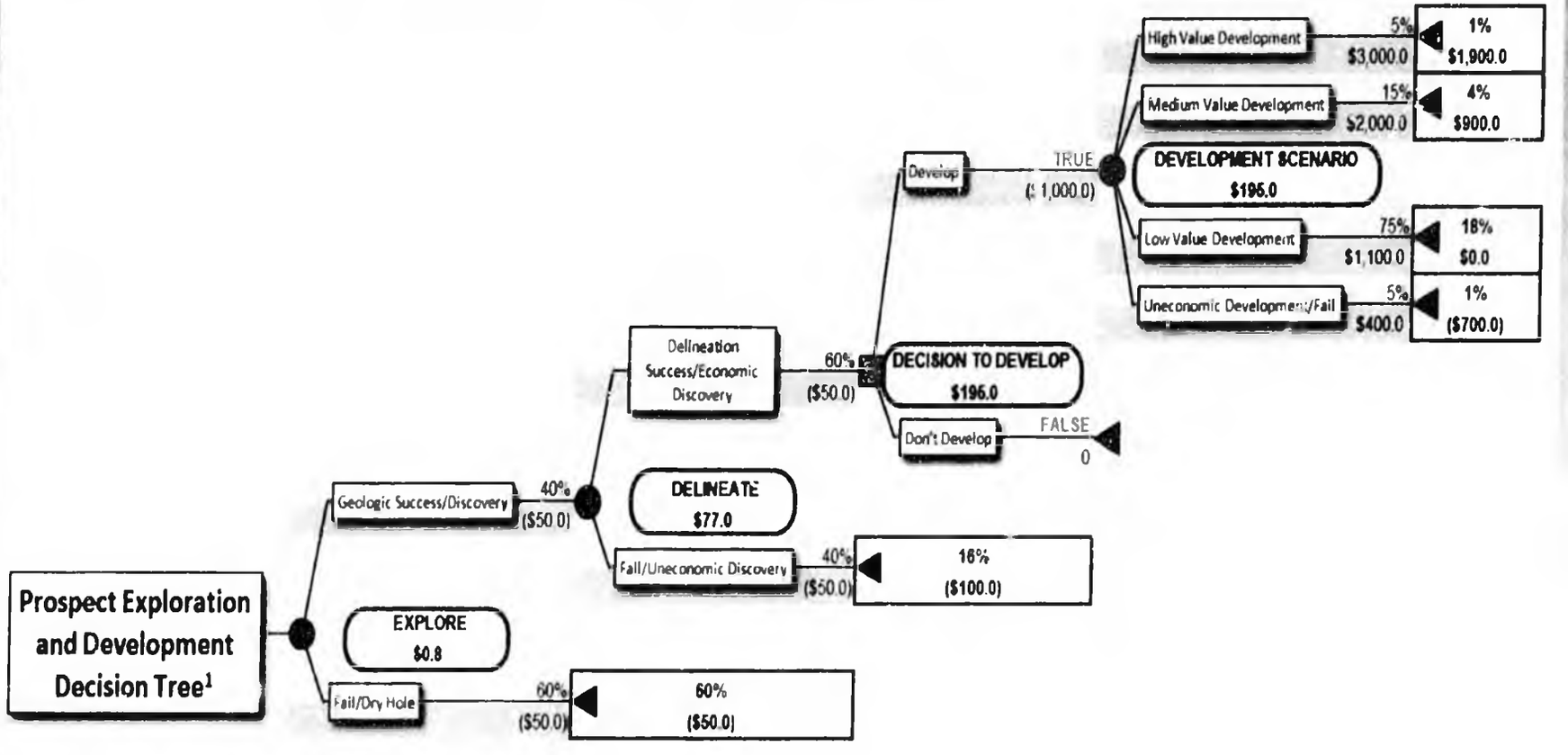
Alaska Division of Oil & Gas
June 13, 2008

Alaska Department of
Natural
Resources

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

Explorer's Decision Tree

Sanction Exploration Drilling (1st Well)	Sanction Delineation Drilling (2nd and 3rd Wells)	Sanction Development Project	Production



[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

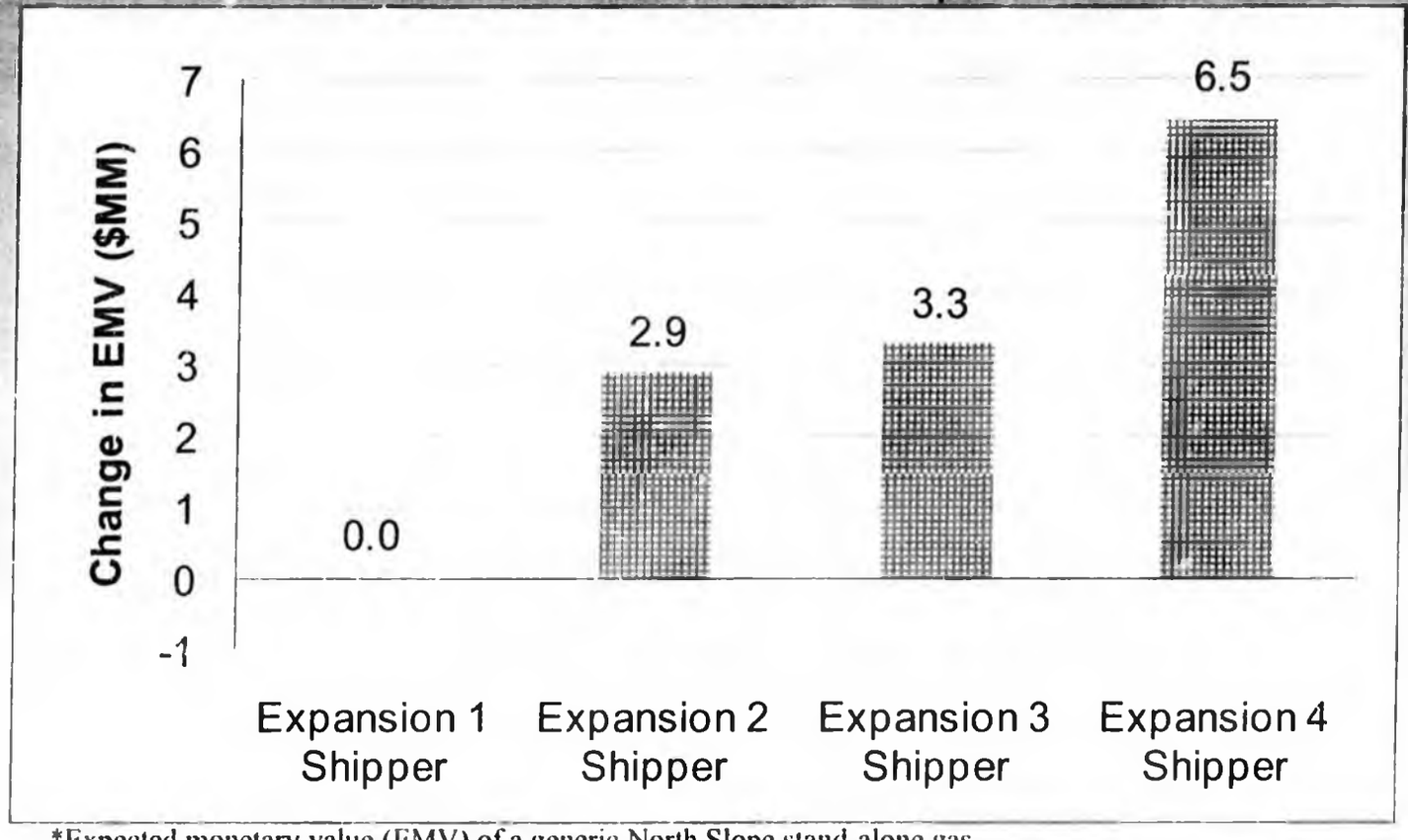
How AGIA Boosts the Success Leg Payoff

- 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*



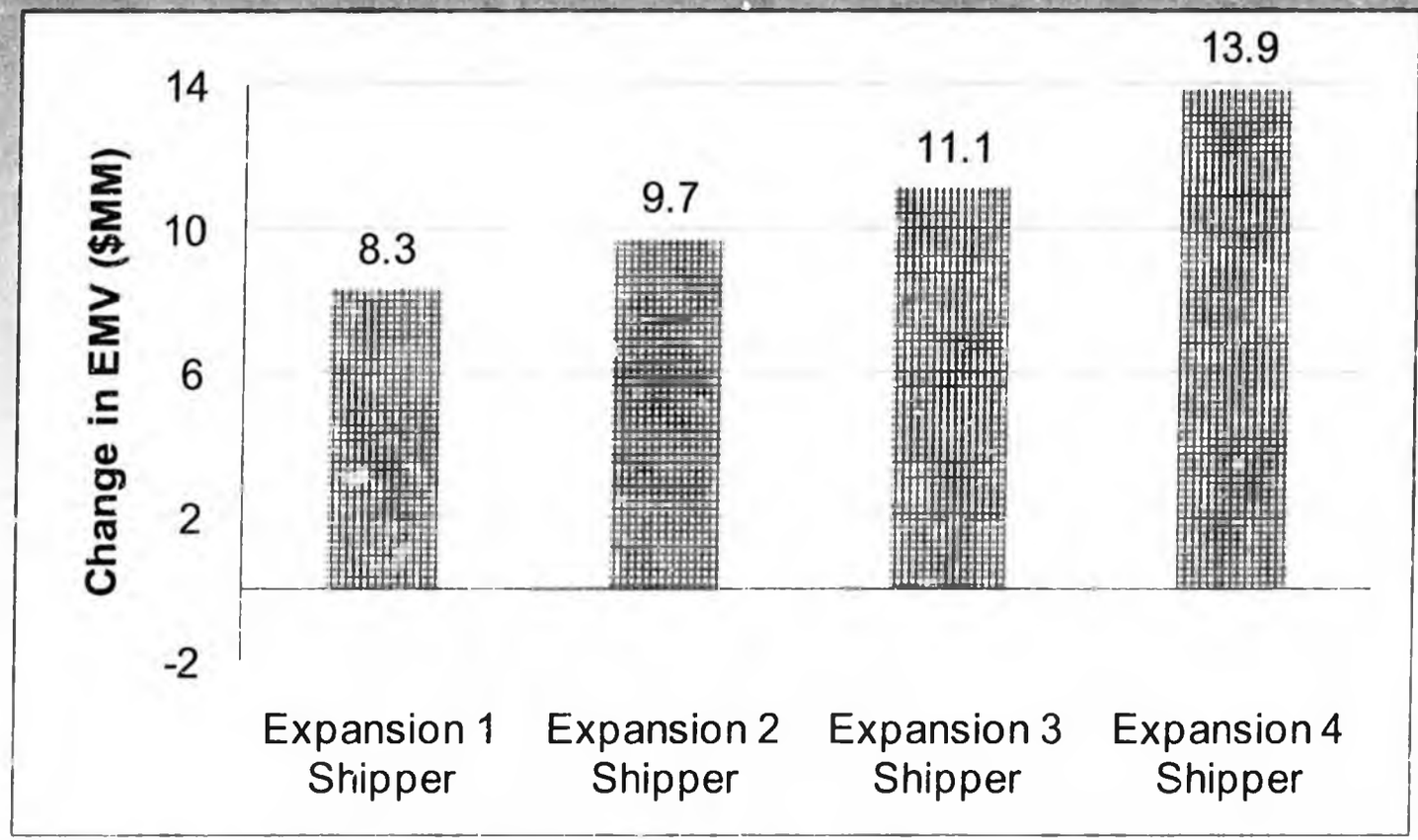
*Expected monetary value (EMV) of a generic North Slope stand-alone gas prospect; 75/25 D/E capital structure for base tariffs, 60/40 for expansions; $8.00 AECO gas price, flat, real

tjr: Prospect Analysis_080513b Regional Exploration Scenarios.xlsm

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*

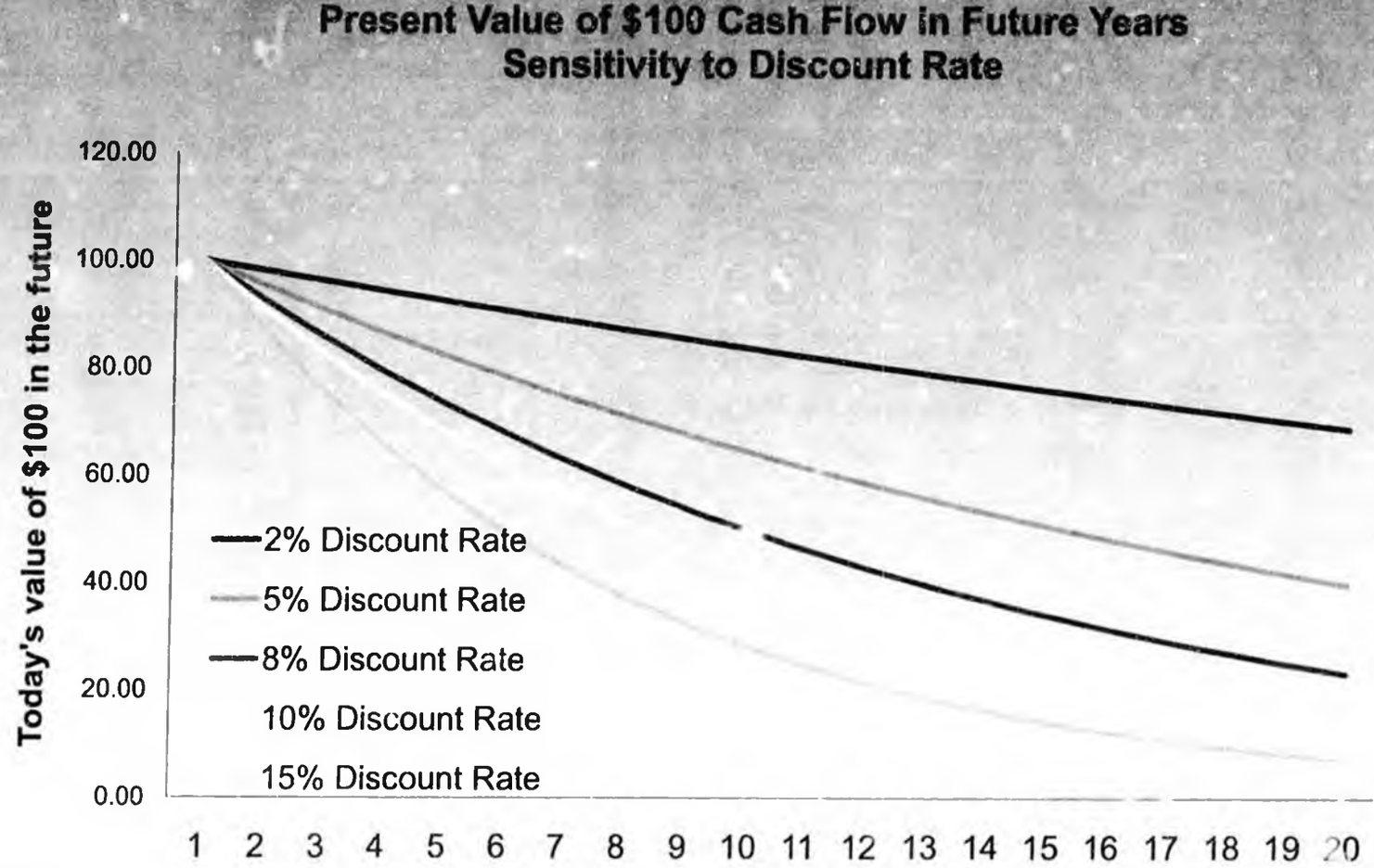


*Expected monetary value (EMV) of a generic North Slope stand-alone gas prospect; $8.00 AECO gas price, flat, real

Critical Results on Access Delays

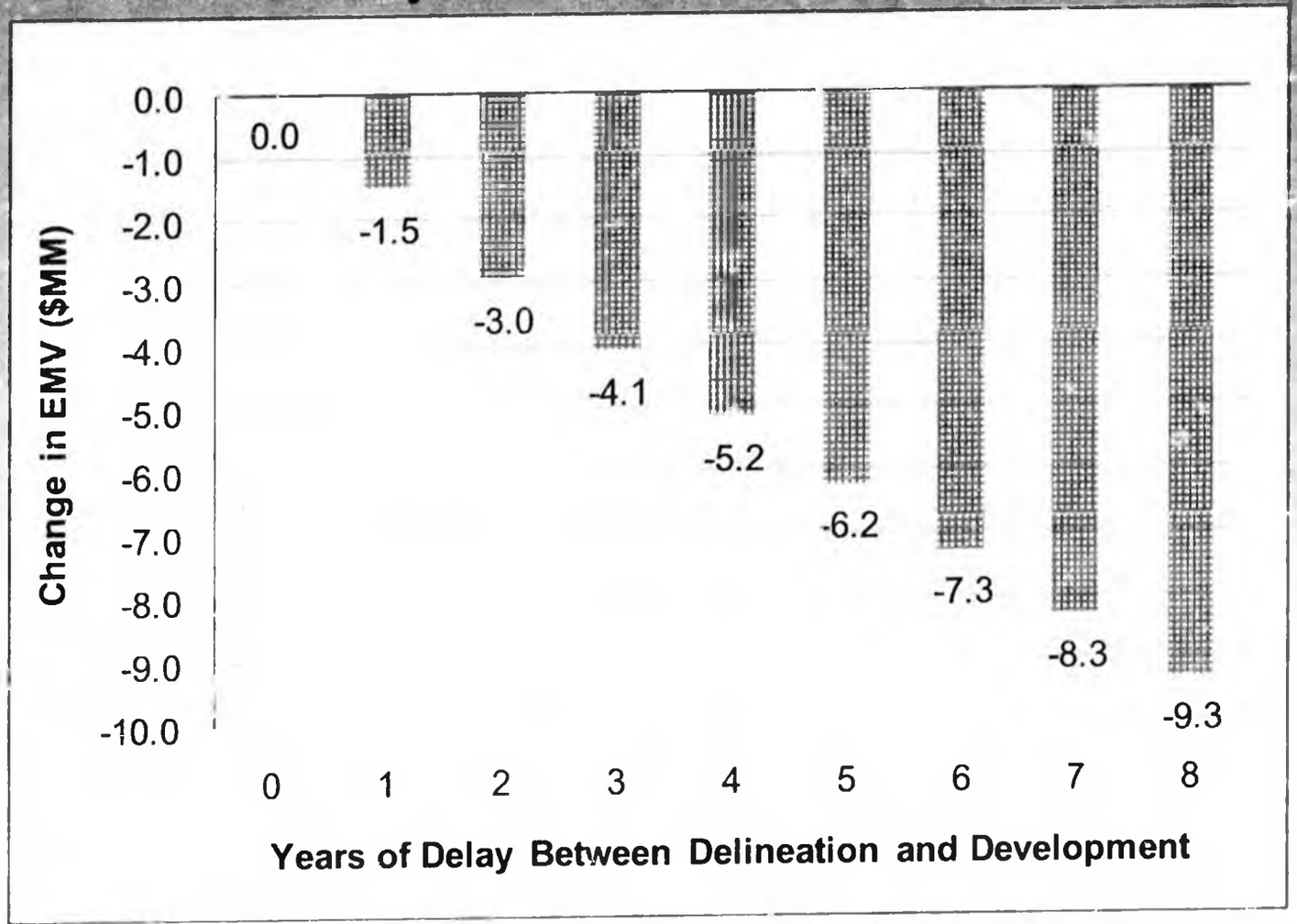
1. Up-front investment for seismic acquisition, exploration drilling, and delineation drilling really hurts the economics of oil and gas projects that risk being delayed for many years
2. Every year of delay in access to a gas pipeline after money has already been invested materially reduces the expected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

How Discounting Works

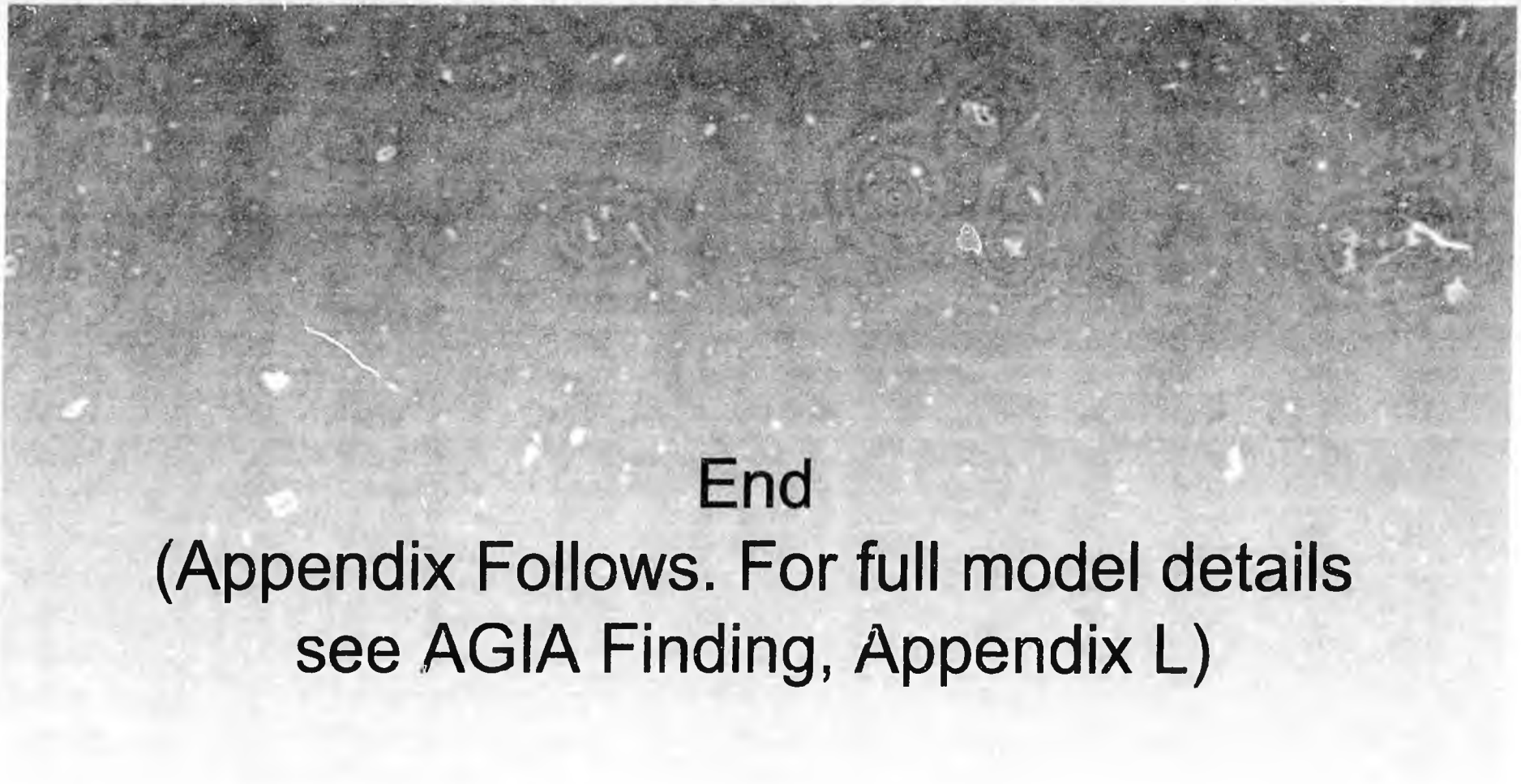


Prospect Economics*

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



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



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

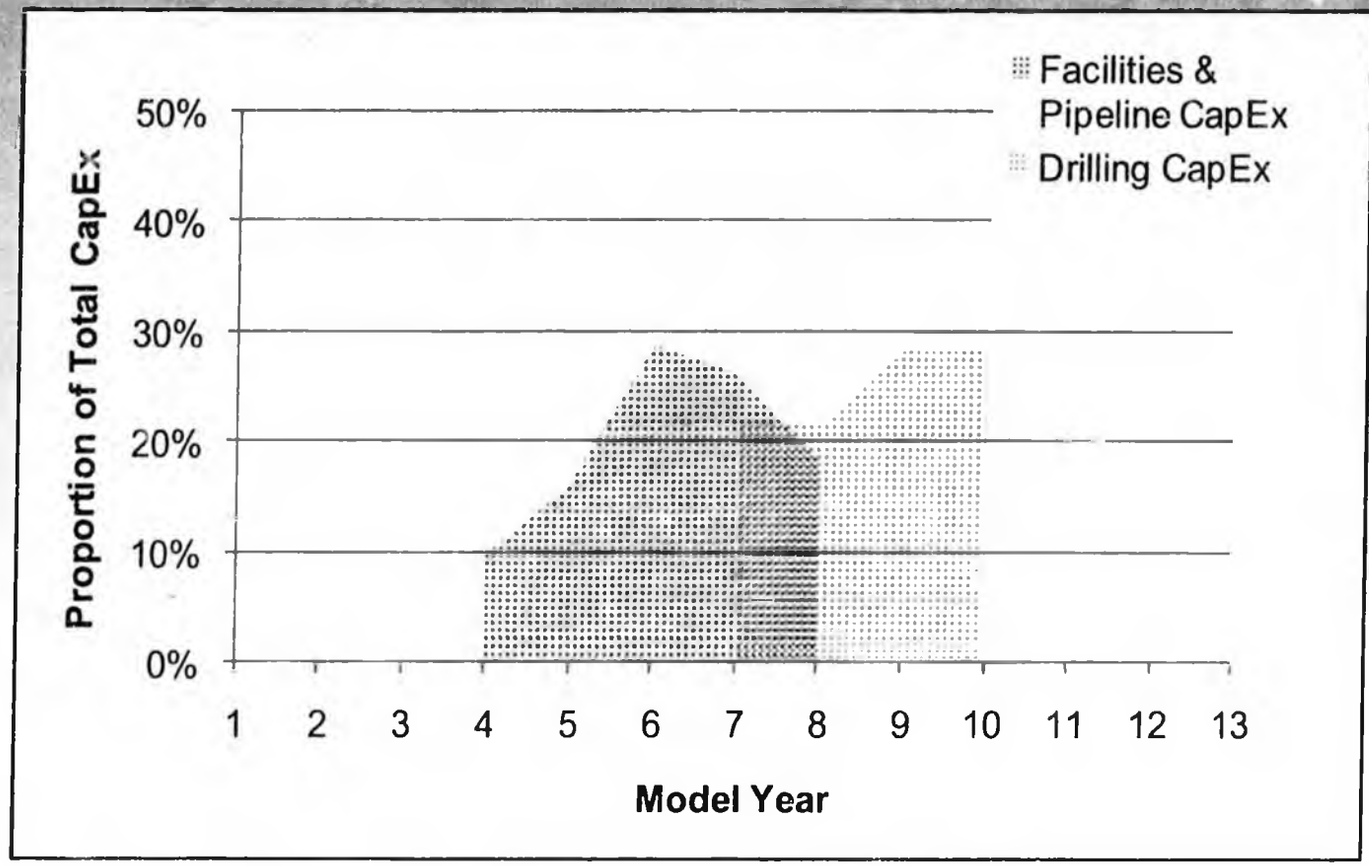
Drilling Success Probabilities

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 = 1,300 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.