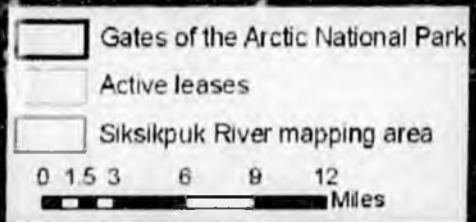


1233

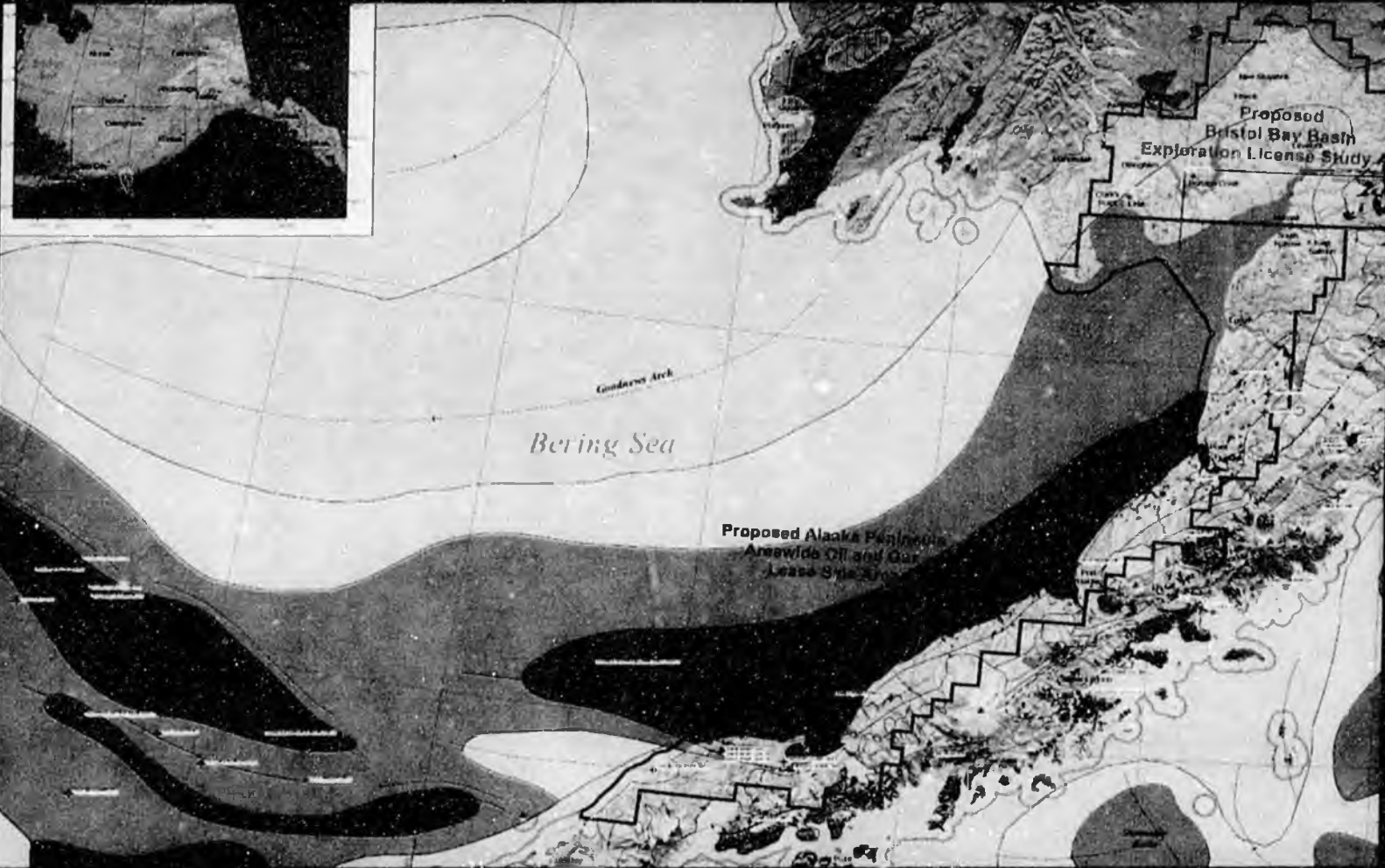
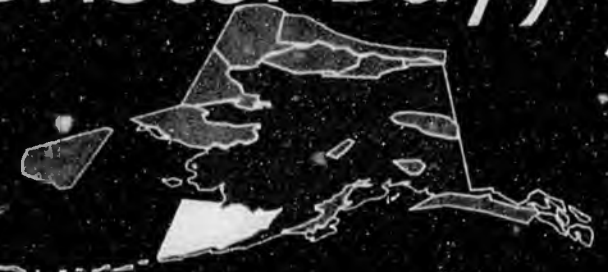
HOUSE REB



Anaktuyuk Pass

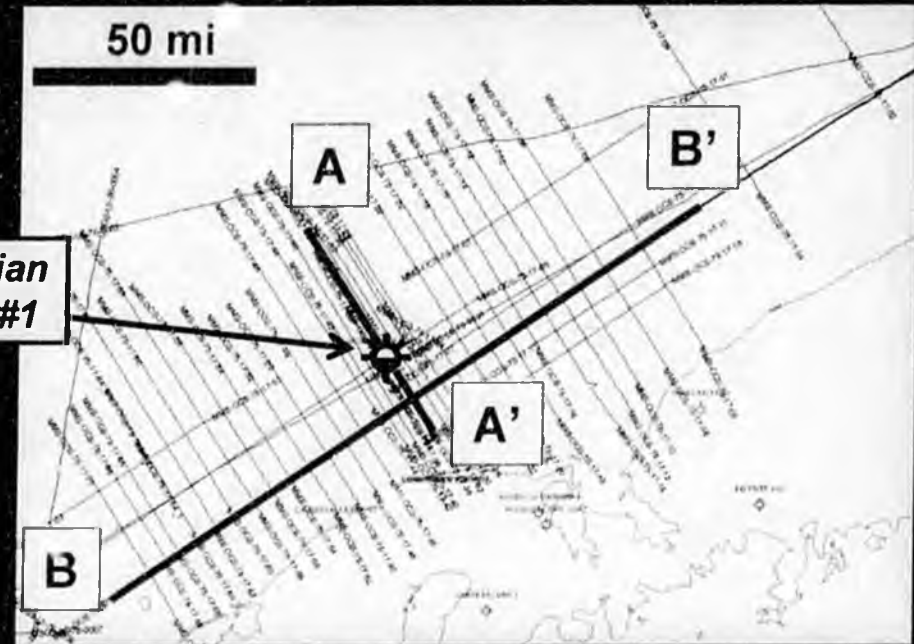
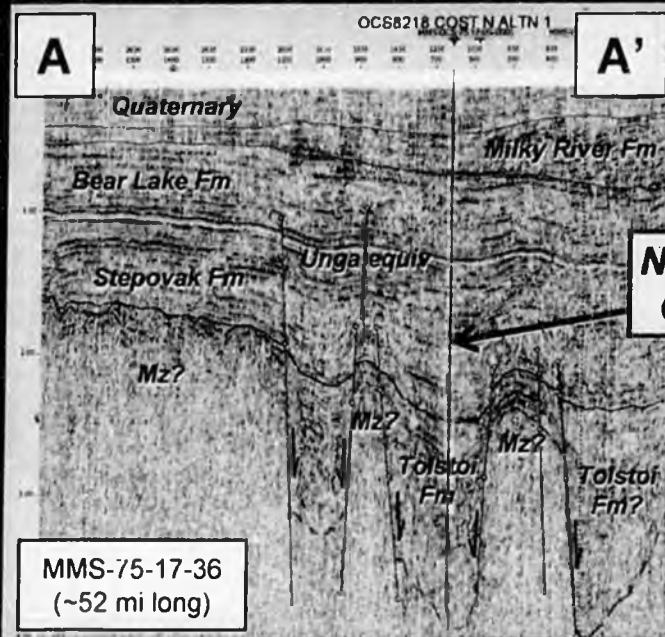
# North Aleutian Basin (Bristol Bay)

Deep water ports  
Actively Promoted by State  
Abundant Seismic Data Exists  
Good Reservoirs likely

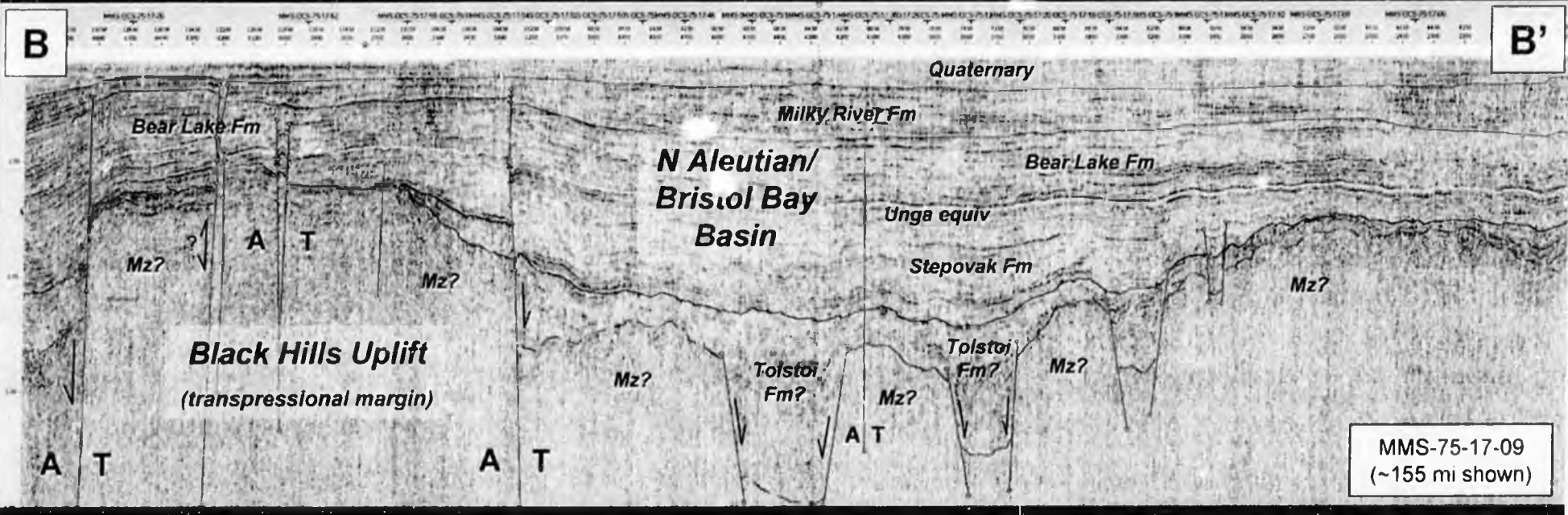


# Regional Seismic Interpretation

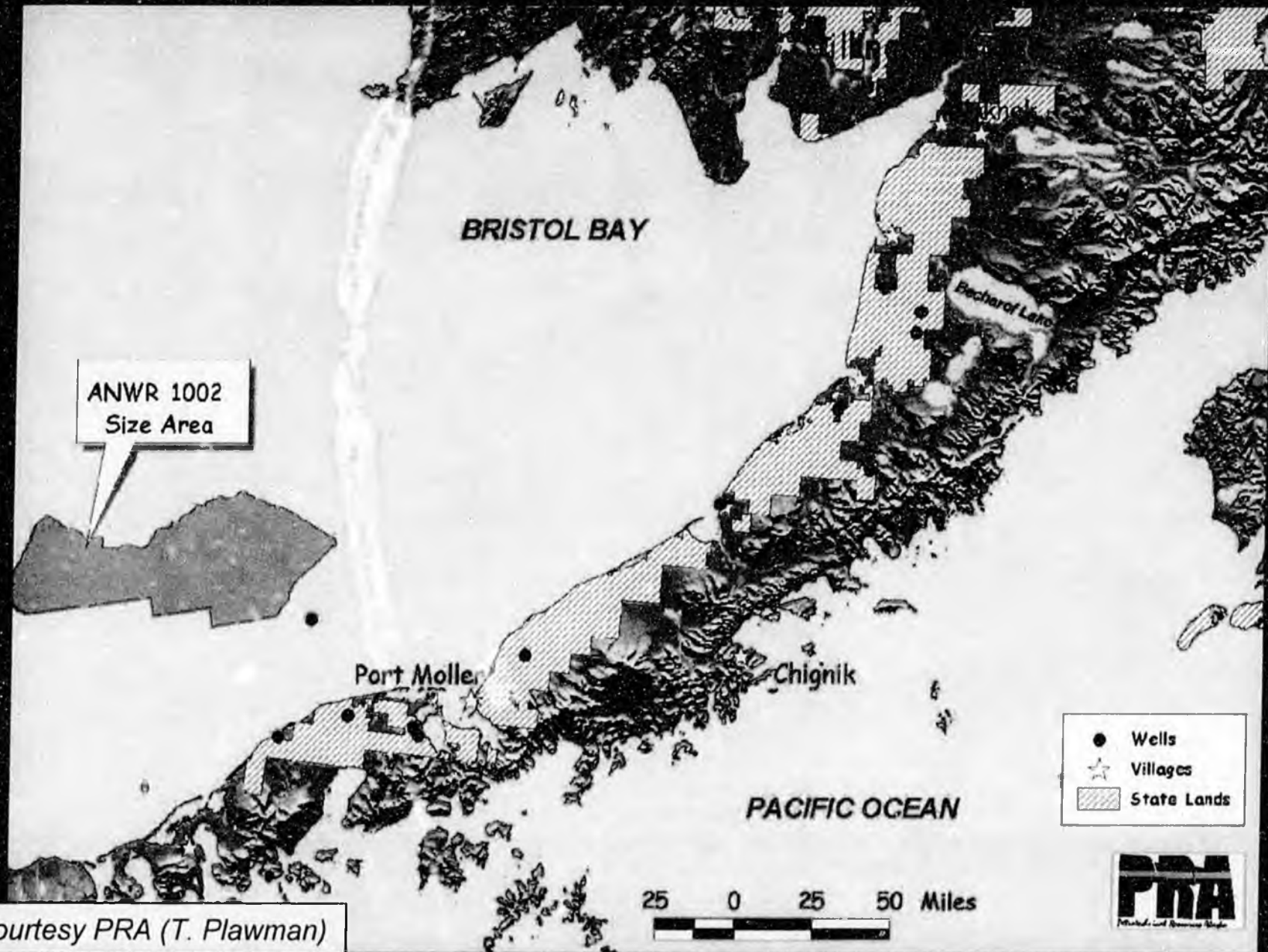
Bristol Bay offshore



**N Aleutian  
COST #1**

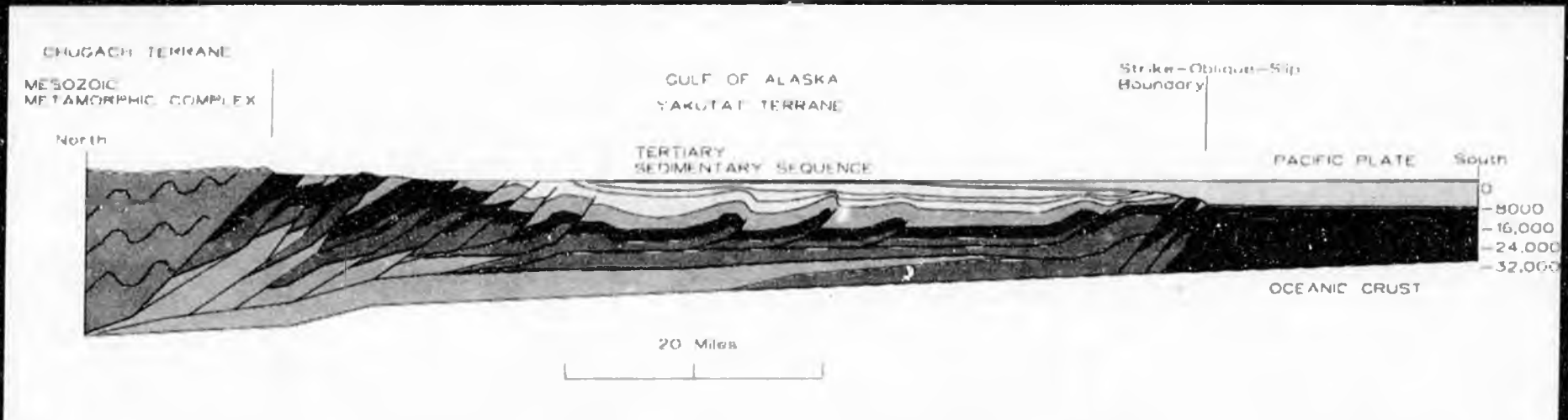
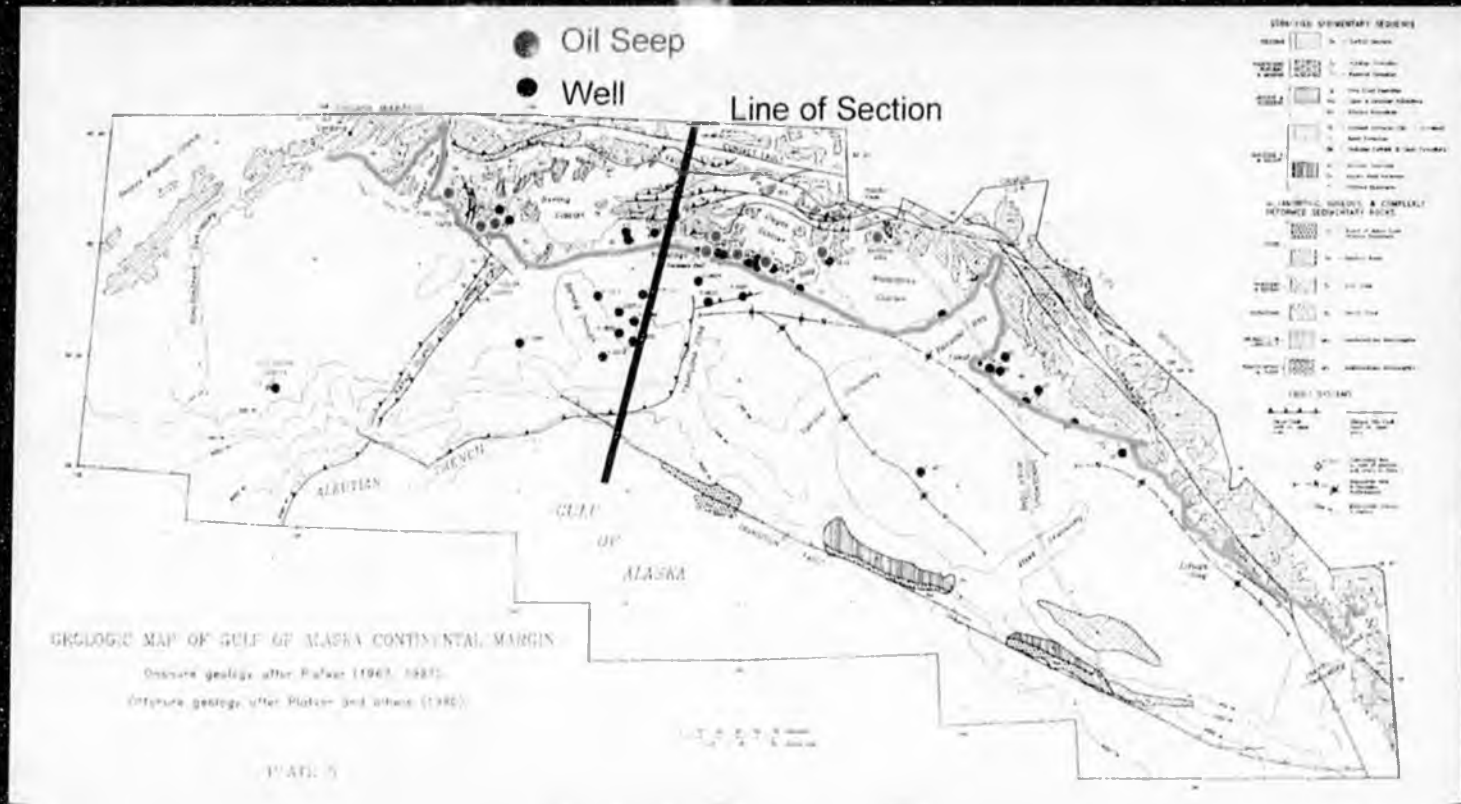


# Size Comparison with ANWR 1002



courtesy PRA (T. Plawman)

# Gulf of Alaska







# Alaska Natural Gas Resources

USGS Estimates of Onshore and State Offshore Natural Gas Resources

## Northern Alaska

- >33 tcf reserves
- mean estimate >150 tcf undiscovered, conventional gas onshore & offshore
- additional nonconventional resources (hydrates, coalbed gas, shale gas, etc.)

## Central Alaska

- mean estimate ~9 tcf undiscovered, conventional gas onshore & offshore
- additional nonconventional resources (coalbed gas, etc.)

## Southern Alaska

- 2 tcf reserves in Cook Inlet
- mean estimate ~20 tcf undiscovered, conventional gas onshore & offshore
- additional nonconventional resources (coalbed gas, etc.)

**Chukchi Sea OCS**  
Range 13.6 - 154.3 tcf  
Mean 60.1 tcf

**Beaufort Sea OCS**  
Range 12.9 - 63.3 tcf  
Mean 32.1 tcf

**NPRA**  
Range 40.4 - 85.3 tcf  
Mean 61.4 tcf

**Non-Federal Area**  
Oil & Gas updates  
in progress

**ANWR 1002 Area**  
Range 0.0 - 10.9 tcf  
Mean 3.8 tcf

**Hope Basin OCS**  
Range 0.0 - 11.1 tcf  
Mean 3.4 tcf

**Norton Basin OCS**  
Range 0.0 - 8.7 tcf  
Mean 2.7 tcf

**Central Alaska**  
Range 0.5 - 7.3 tcf  
Mean 2.8 tcf

**St. Matthew-Hall OCS**  
Range 0.0 - 0.7 tcf  
Mean 0.2 tcf

**St. George Basin OCS**  
Range 0.0 - 9.7 tcf  
Mean 3.0 tcf

**North Aleutian Basin OCS**  
Range 0.0 - 17.3 tcf  
Mean 6.8 tcf

**Cook Inlet OCS**  
Range 0.7 - 2.5 tcf  
Mean 1.4 tcf

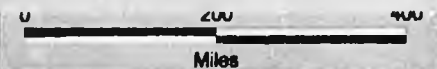
**Southern Alaska**  
Range 0.7 - 4.3 tcf  
Mean 2.1 tcf

**Gulf of Alaska OCS**  
Range 0.9 - 10.6 tcf  
Mean 4.2 tcf

**Shumagin & Kodiak OCS**  
Range 0.0 - 11.4 tcf  
Mean 2.7 tcf

**Explanation**  
Sedimentary Basins  
Assessment Boundaries  
USGS  
MMS

Numbers posted are for technically recoverable, undiscovered volumes of conventional natural gas resources



**Sources of Information:**  
NPRA natural gas: USGS Fact Sheet 045 02 (2002)  
ANWR natural gas: USGS Fact Sheet 028 01 (2001)  
Other onshore natural gas: USGS Circular 1116 (1995)  
OCS natural gas: MMS Alaska Federal Offshore Update (2003)

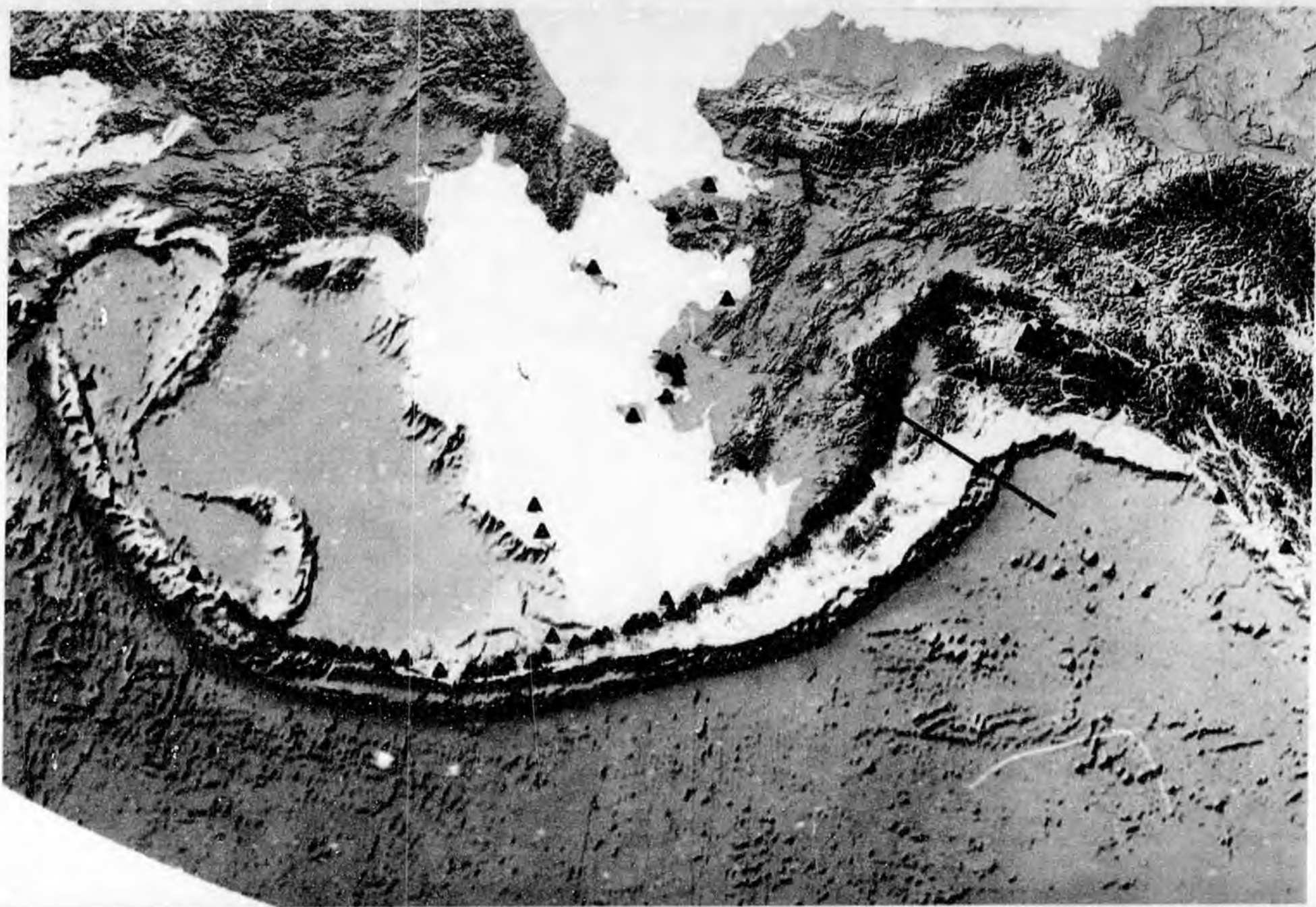
# Proven Gas Reserves

*Gas Reserves*

## North Slope *(BCF)*

Badami Unit	39	
Barrow	34	
Colville River Unit	60	
Duck Island Unit	843	
Kuparuk River Unit	611	
Milne Point Unit	14	
North Star	450	
Prudhoe Bay Unit	23,879	
Other Undeveloped	8,000	
<b>TOTAL North Slope</b>	<b>33,930</b>	<b>94%</b>
<b>Cook Inlet</b>	<b>2,240</b>	<b>6%</b>
<b>TOTAL STATE</b>	<b>36,170</b>	

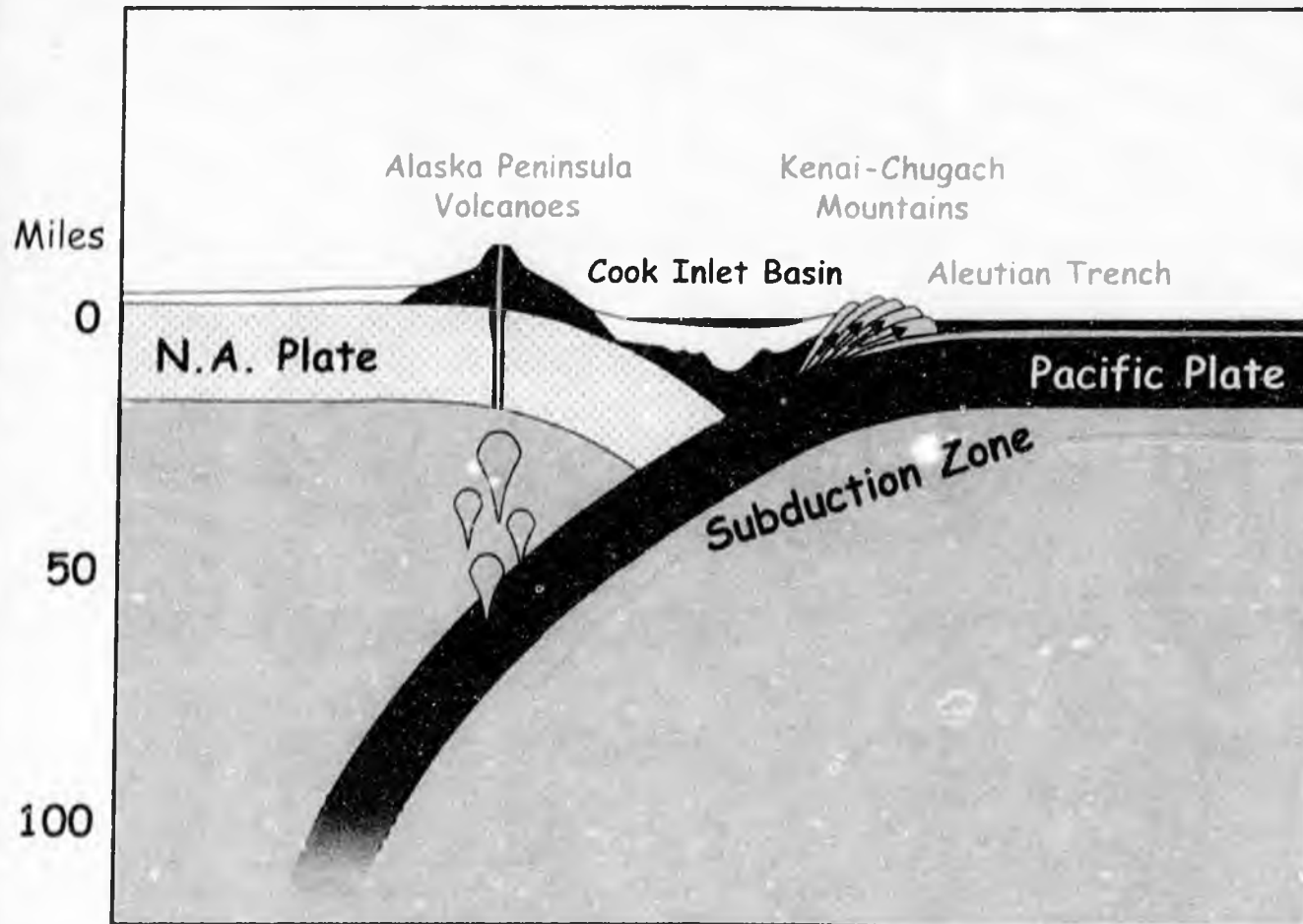




# UPPER COOK INLET BASIN Basin / Reservoir Origins

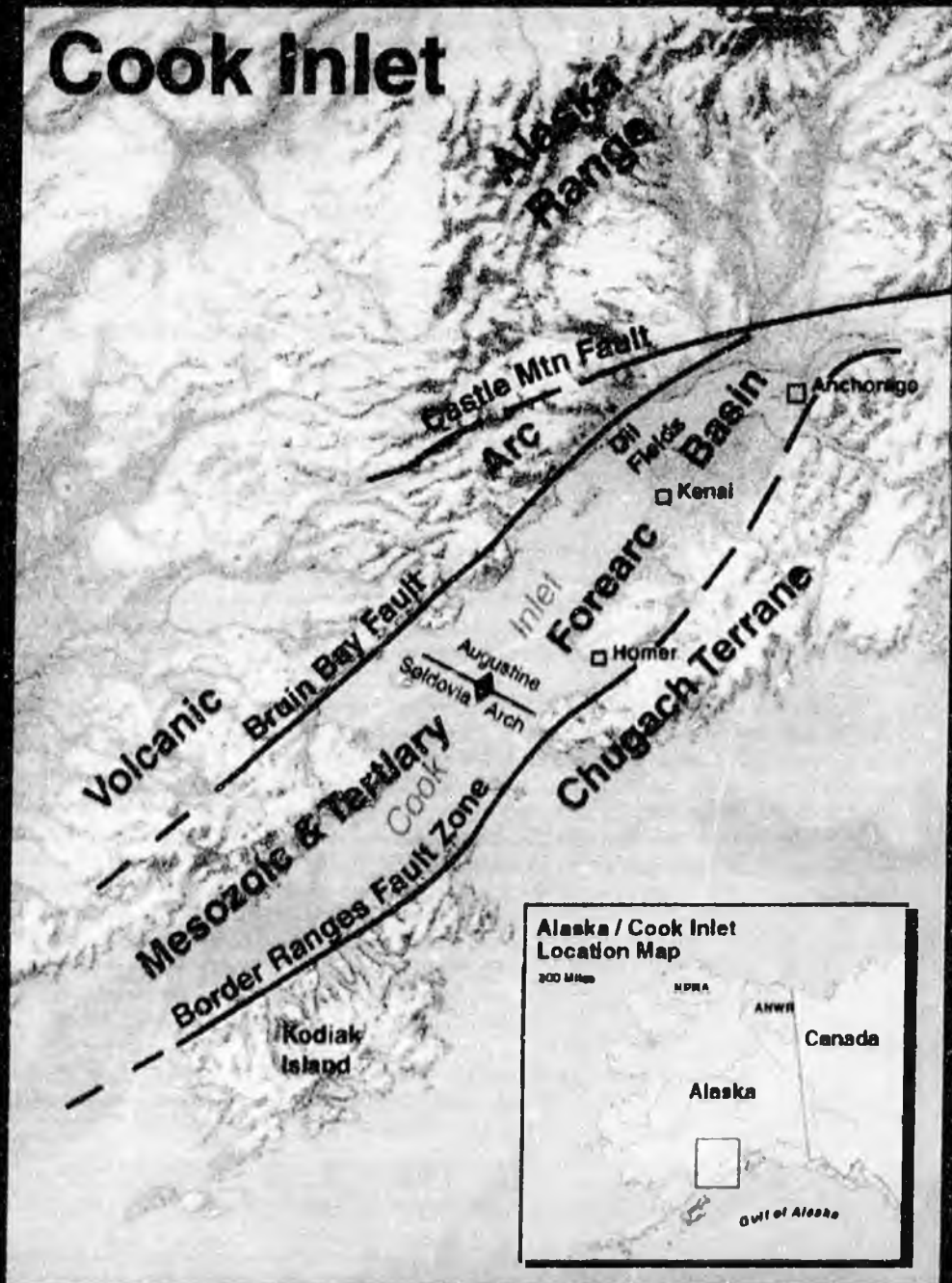
NW

SE

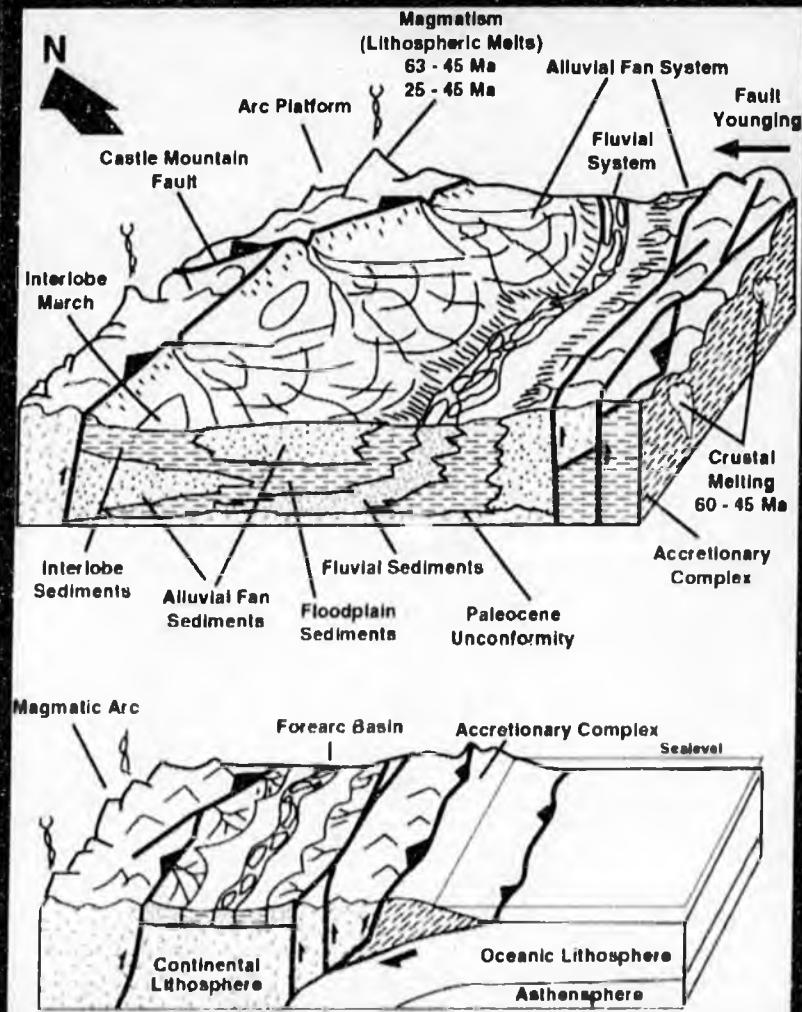


Modified from:  
Tornqvist, T., 2005, Principles of Sedimentology and Stratigraphy, University of Chicago,  
<http://www.uic.edu/classes/geol/eaes350/>

# Cook Inlet

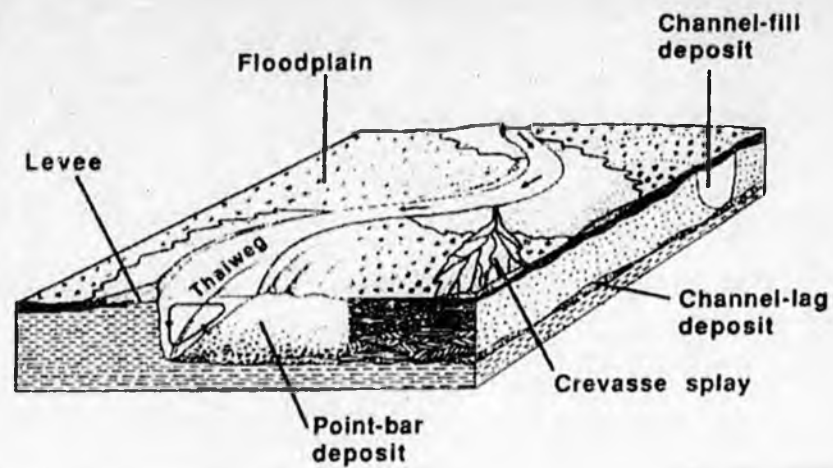


# Importance of Provenance

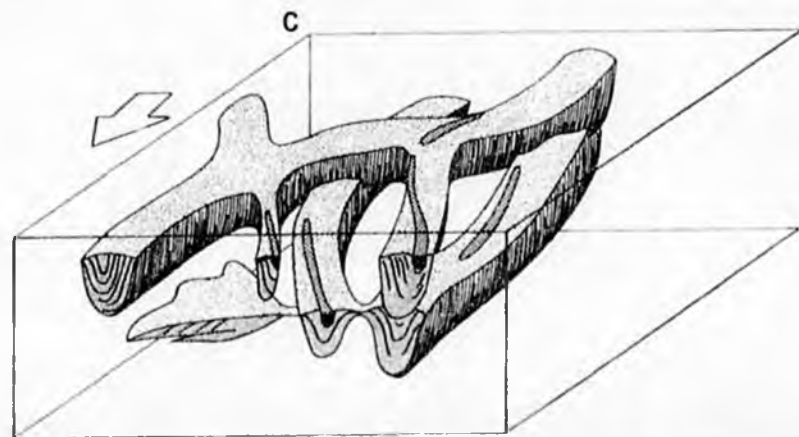
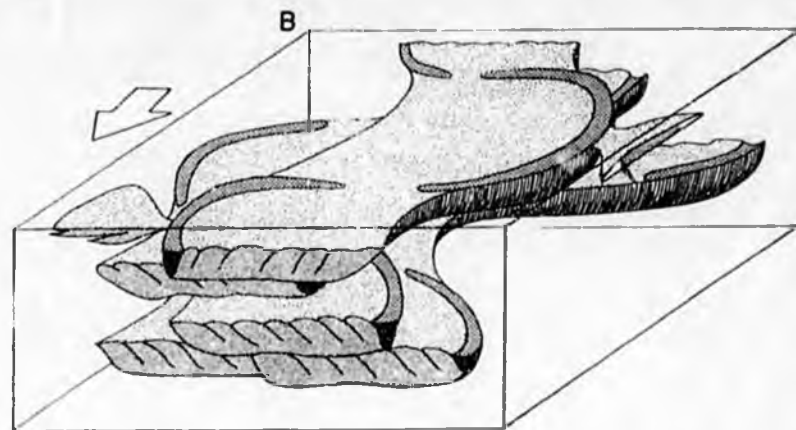
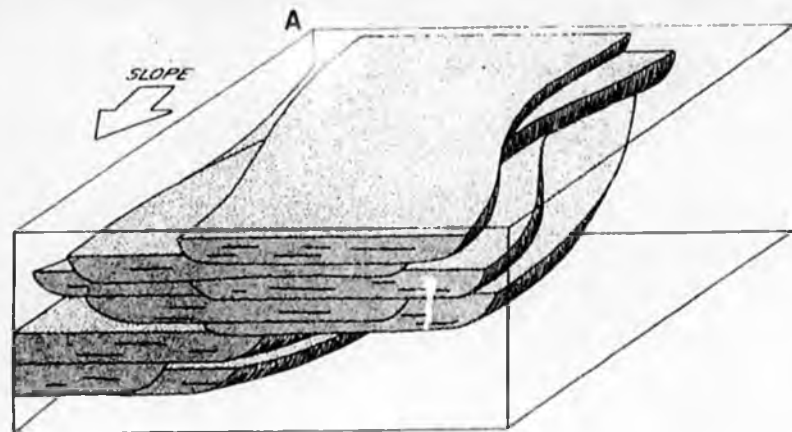


McGowen, et. al., 1994

# Tertiary Basin Depositional Systems



# Fluvial Channel Geometry

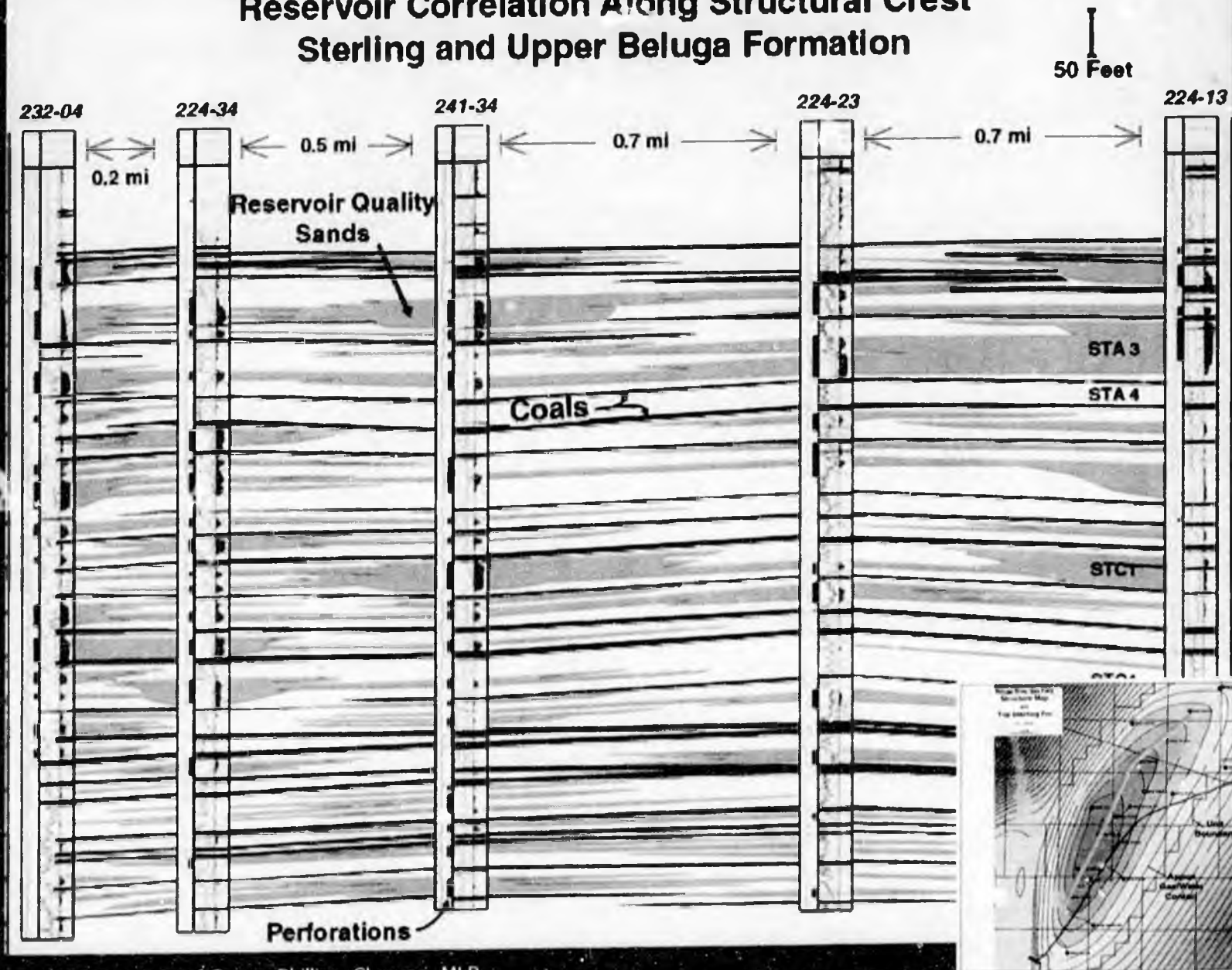


# Outcrop of Tertiary Non-Marine Sediments



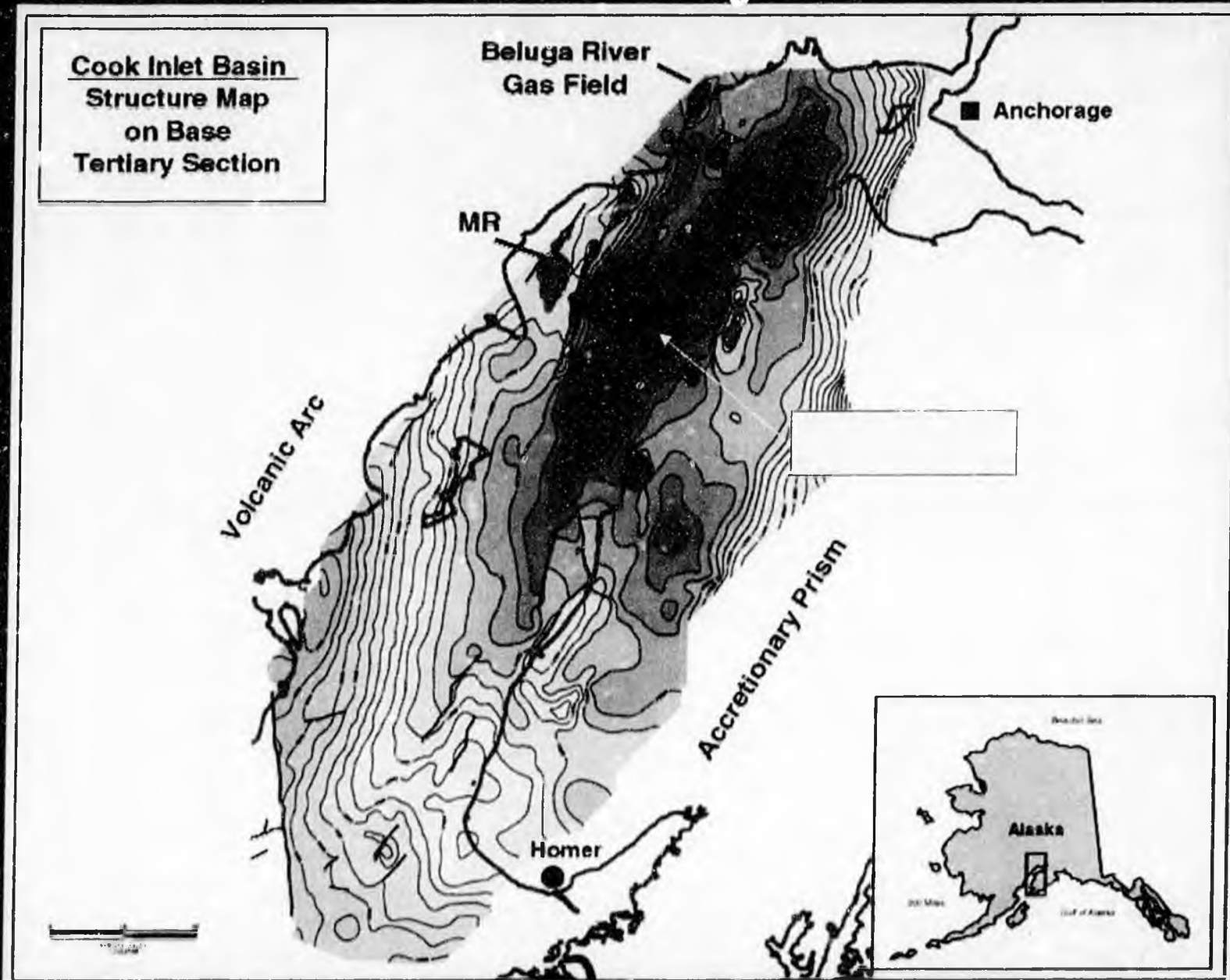
# Sand Distribution in a Fluvial System

## Beluga River Gas Field Reservoir Correlation Along Structural Crest Sterling and Upper Beluga Formation



From Swenson, 1997, courtesy of ConocoPhillips, Chevron, MLP

# Tertiary Reservoir Section



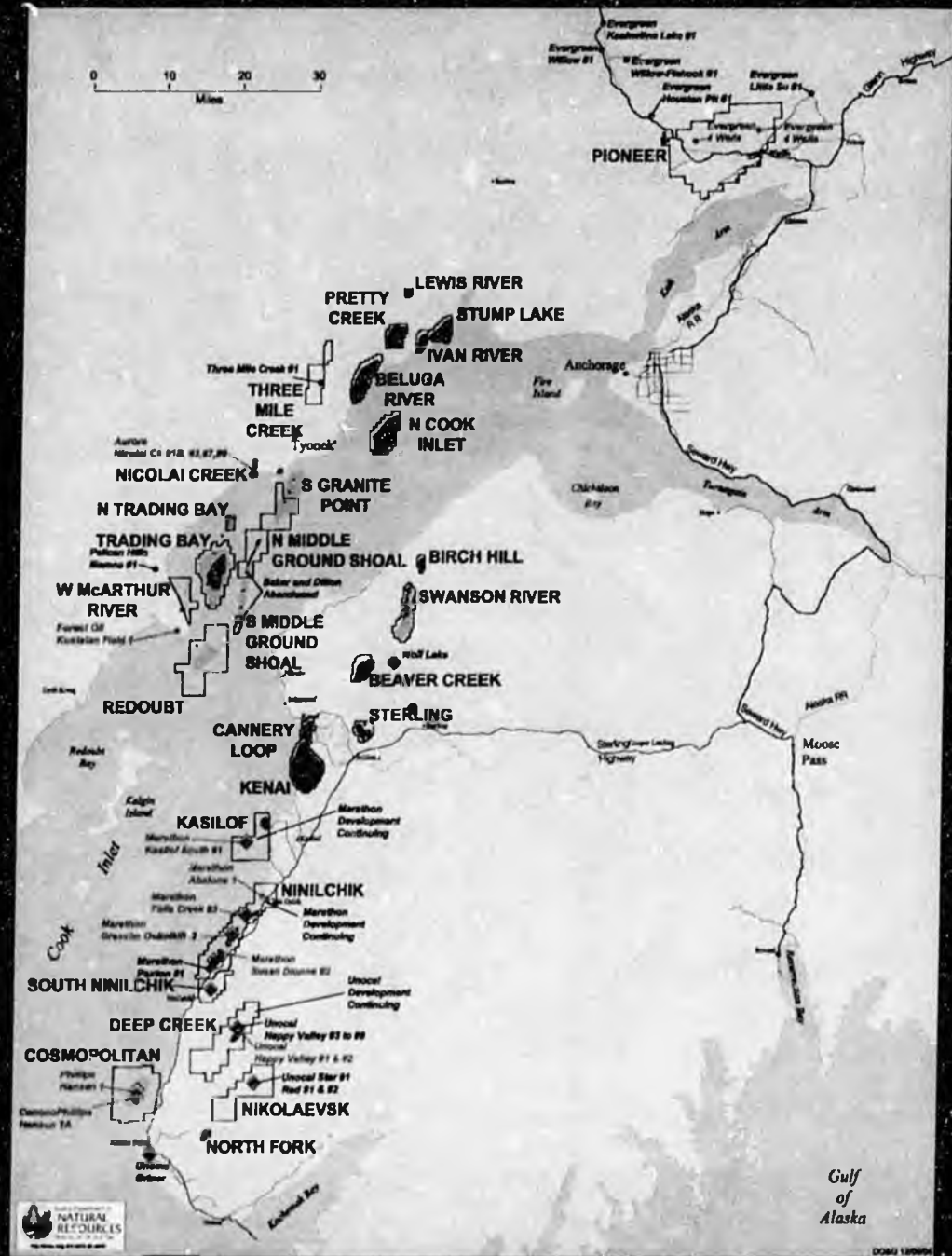
# Cook Inlet Oil & Gas Activities & Discoveries

## Map Legend

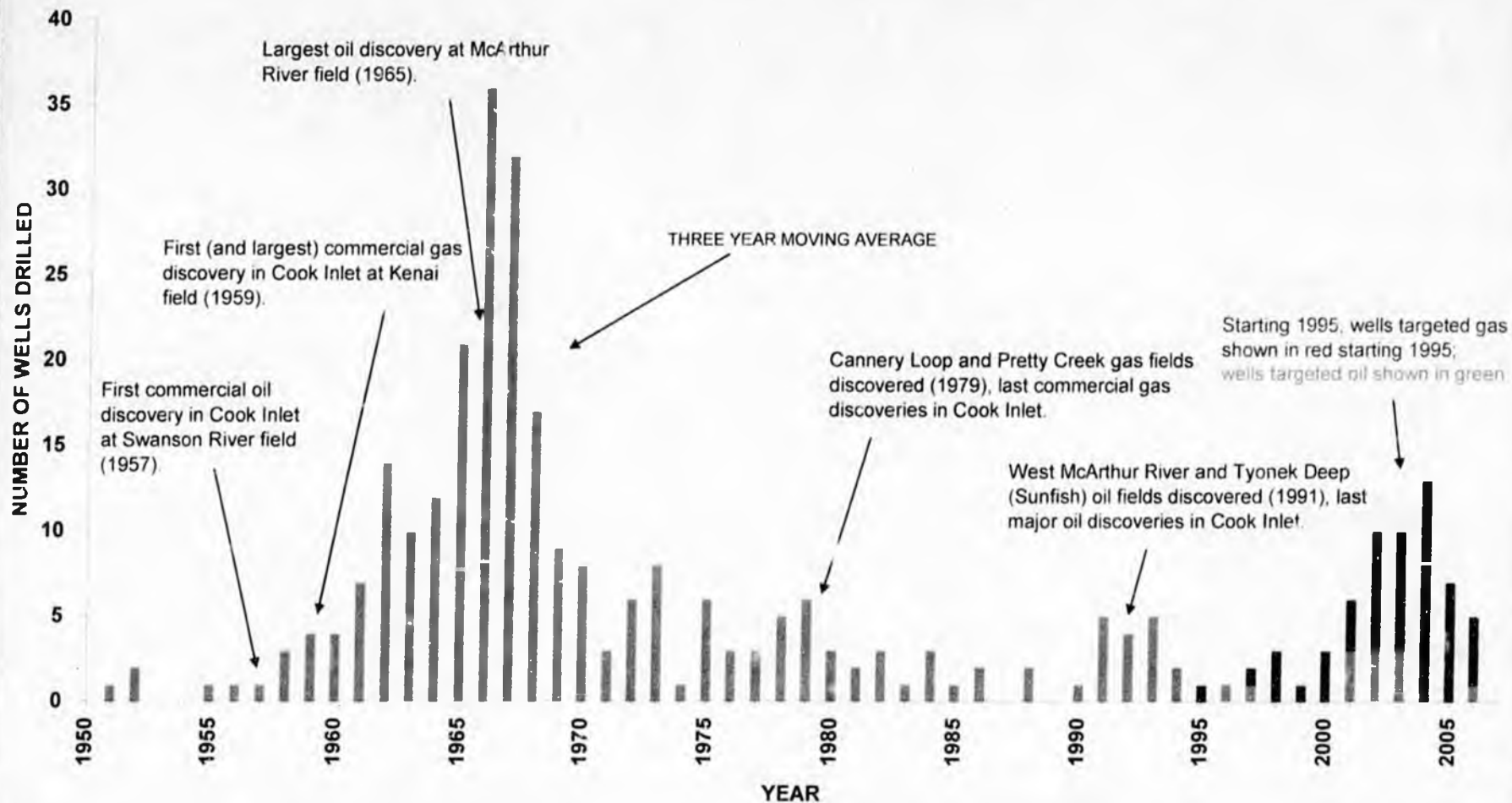
-  Units
-  Oil Accumulations\*
-  Gas Accumulations\*
-  Recent Oil Discoveries
-  Recent Gas Discoveries
-  2004 Active and Proposed Exploration Wells
-  2003 Exploration Wells
-  Platforms
-  Road
-  Alaska Railroad



\*Oil and Gas Accumulations are Approximate



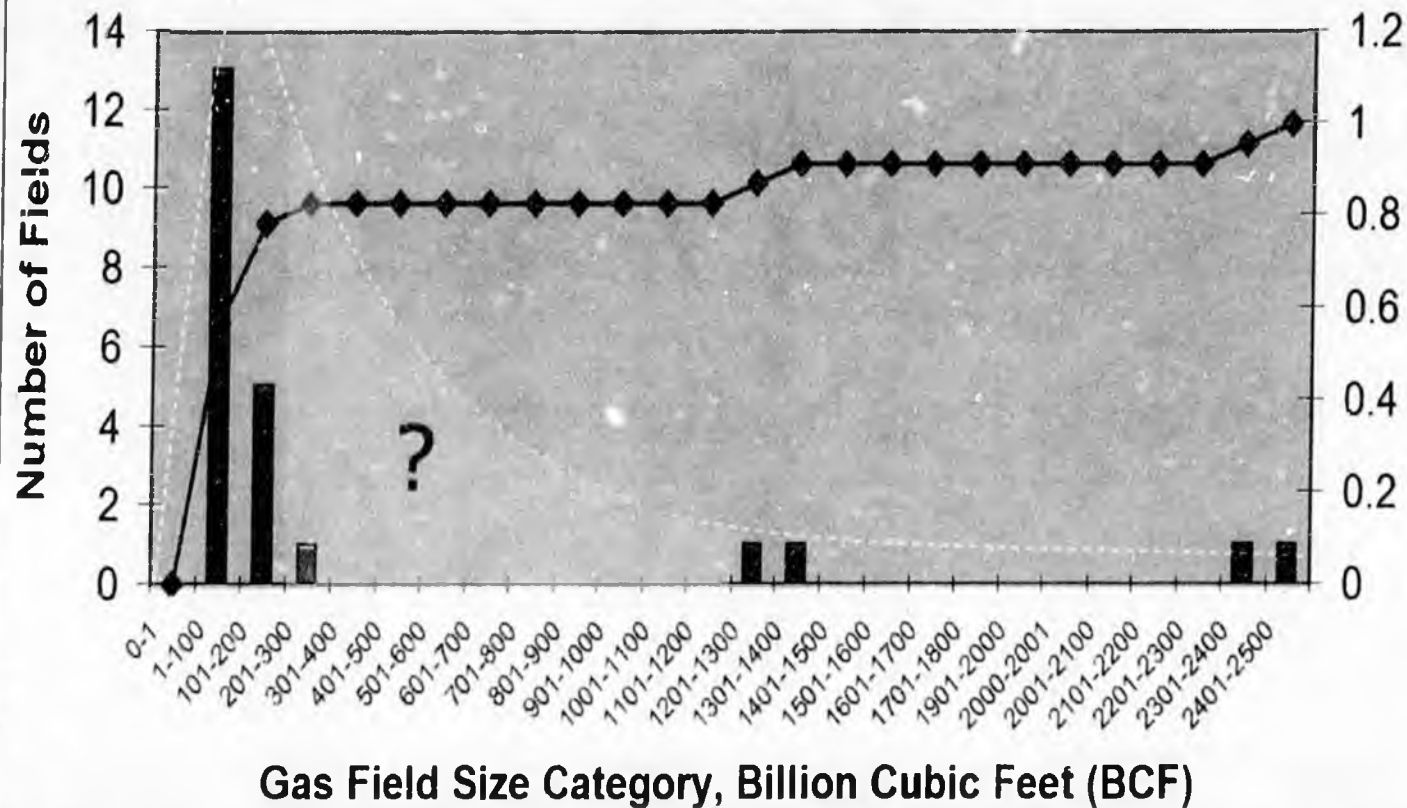
# Cook Inlet Exploration Wells Drilled, 1950 - 2006



# Gas Field Size Distribution – Cook Inlet

## EUR-Field Size Distribution

### Cumulative Frequency



Nicoli Creek	3
Stump Lake	6
Pretty Creek	6
West Fork	7
Lewis River	9
North Fork	12
Falls Creek	13
Birch Hill	22
Sterling	26
N Trading Bay Ur	30
Moquakie	43
Wolf Lake	50
Trading Bay	90
Ivan River	104
M G S	112
Cannery Loop	118
Granite Point	137
Swanson River	145
Beaver Creek	242
BRU	1266
McAurther River	1384
NCI	2328
Kenai	2425

**TOTAL= 8576 bcf**

**Mean = 373 tcf**

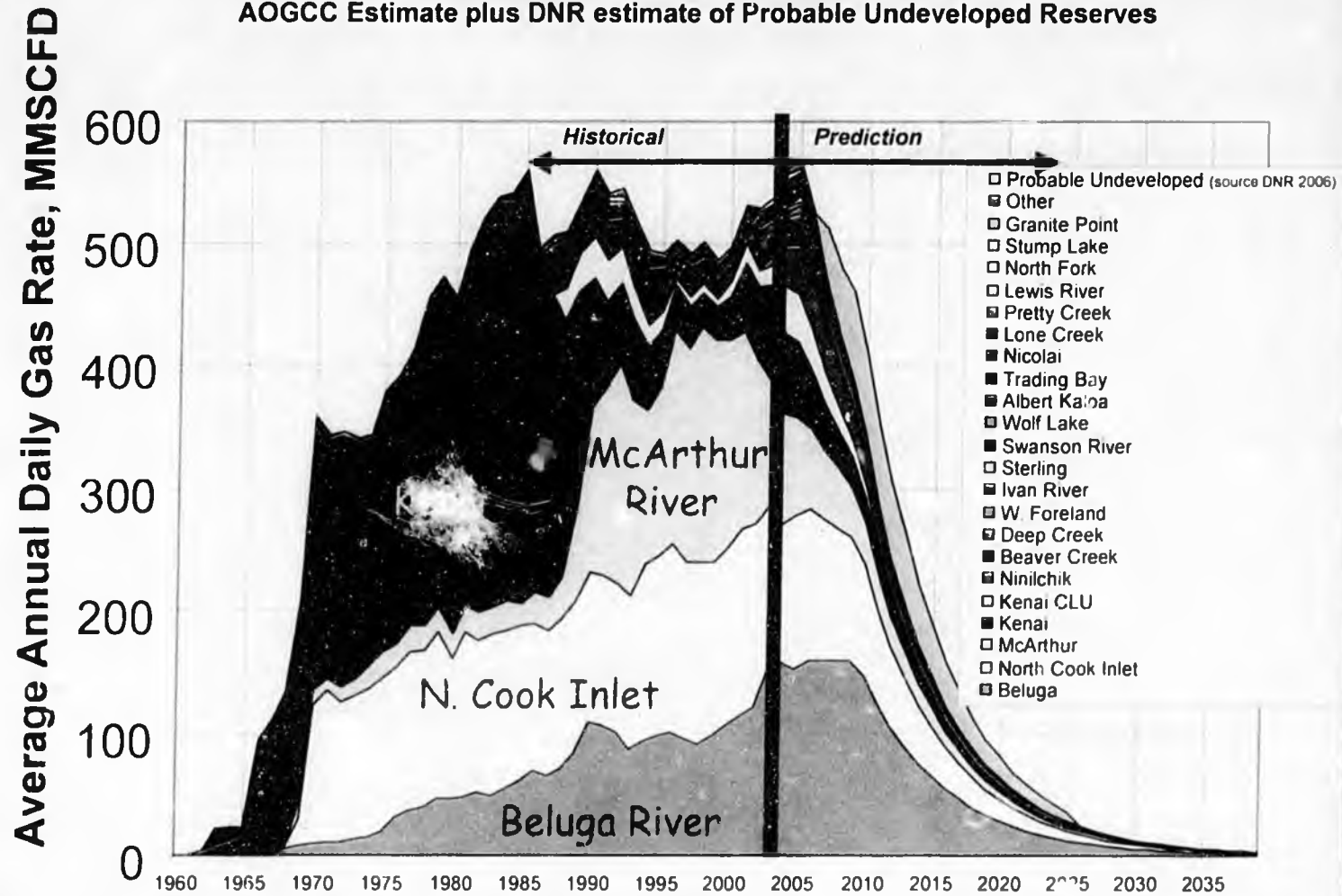
# Cook Inlet Gas Pools Rates

## Historic & Forecast

### Cook Inlet Historical and Projected Production

Proved Non-associated Gas

AOGCC Estimate plus DNR estimate of Probable Undeveloped Reserves



# Is there more gas out there?

- ▶ Yes

## Where will it be found?

- ▶ In existing fields
- ▶ In new exploration play types

## What are the hurdles?

- ▶ Expensive data and drilling costs
- ▶ Limited market
- ▶ Complicated land access

# Cook Inlet Gas Exploration Potential

Only structural traps have been explored for or developed  
– stratigraphic trap potential untapped

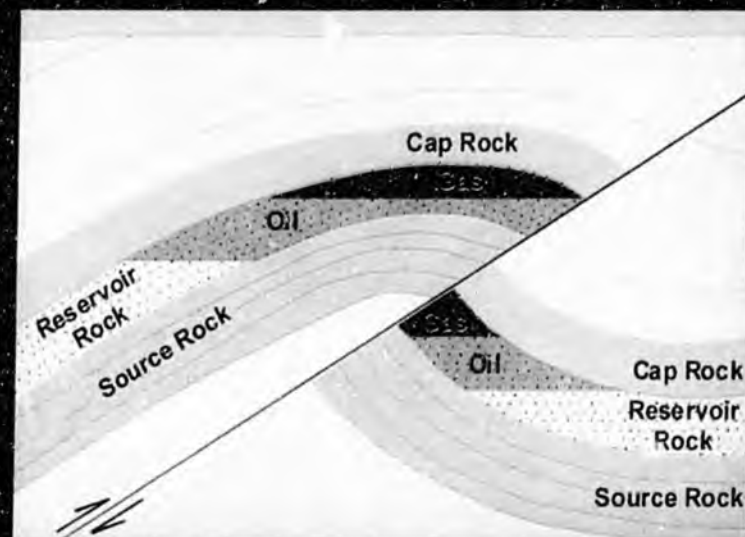
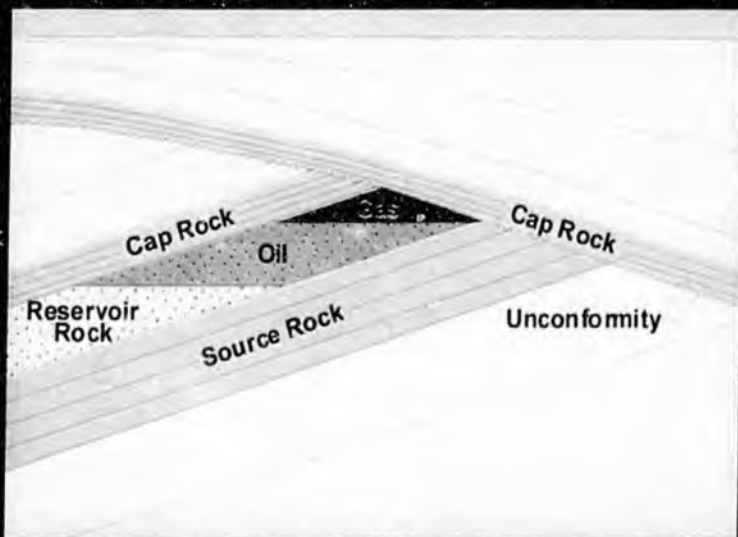
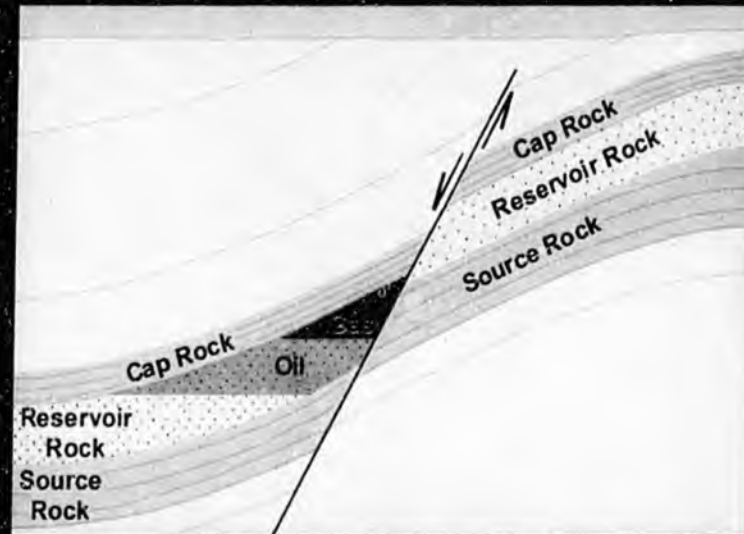
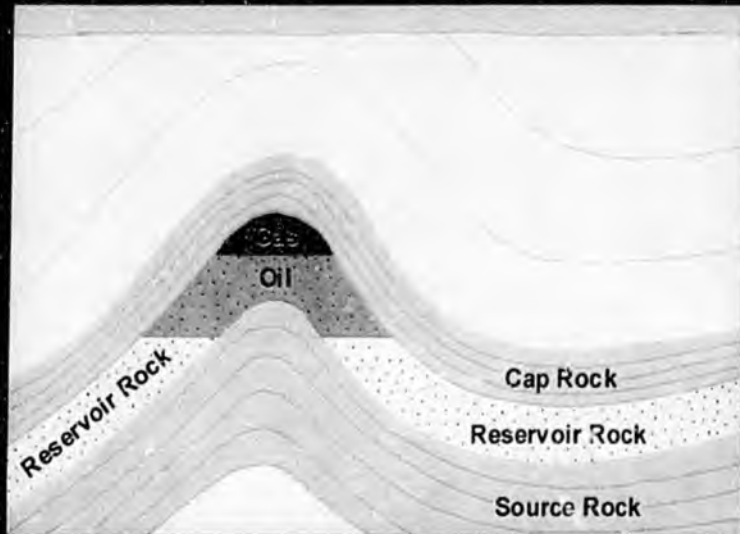
85% of gas discovered early in exploration cycle while drilling for oil

Only 70 exploration wells drilled strictly for gas

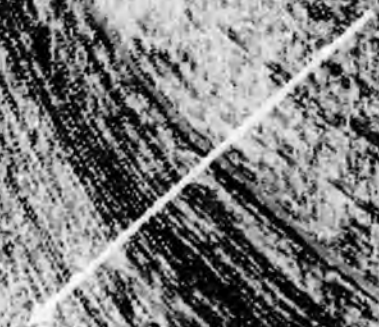
Nearly one in ten fields >2 tcf

- 4 largest fields have 86% of reserves
- Field-size distribution lacks discoveries in 300-1300 bcf range → yet to be discovered?

# Oil and Gas Trapping Mechanisms



EW 1 - Granite pt



0  
300  
1000  
1500  
2000  
2500  
3000  
3500  
4000

Seismic Data provided courtesy of  
Veritas Geophysical Corporation

NCI field

"Low Hanging Fruit"



0  
500  
1000  
1500  
2000  
2500  
3000  
3500  
4000

Seismic Data provided courtesy of  
Veritas Geophysical Corporation

NCI field  
"Flat Spots"



Seismic Data provided courtesy of  
Veritas Geophysical Corporation



Subtle Stratigraphic Traps

Seismic Data provided courtesy of  
Veritas Geophysical Corporation

What is the State Geological Survey  
Doing to Help?

# Beluga Formation Near Fritz Creek

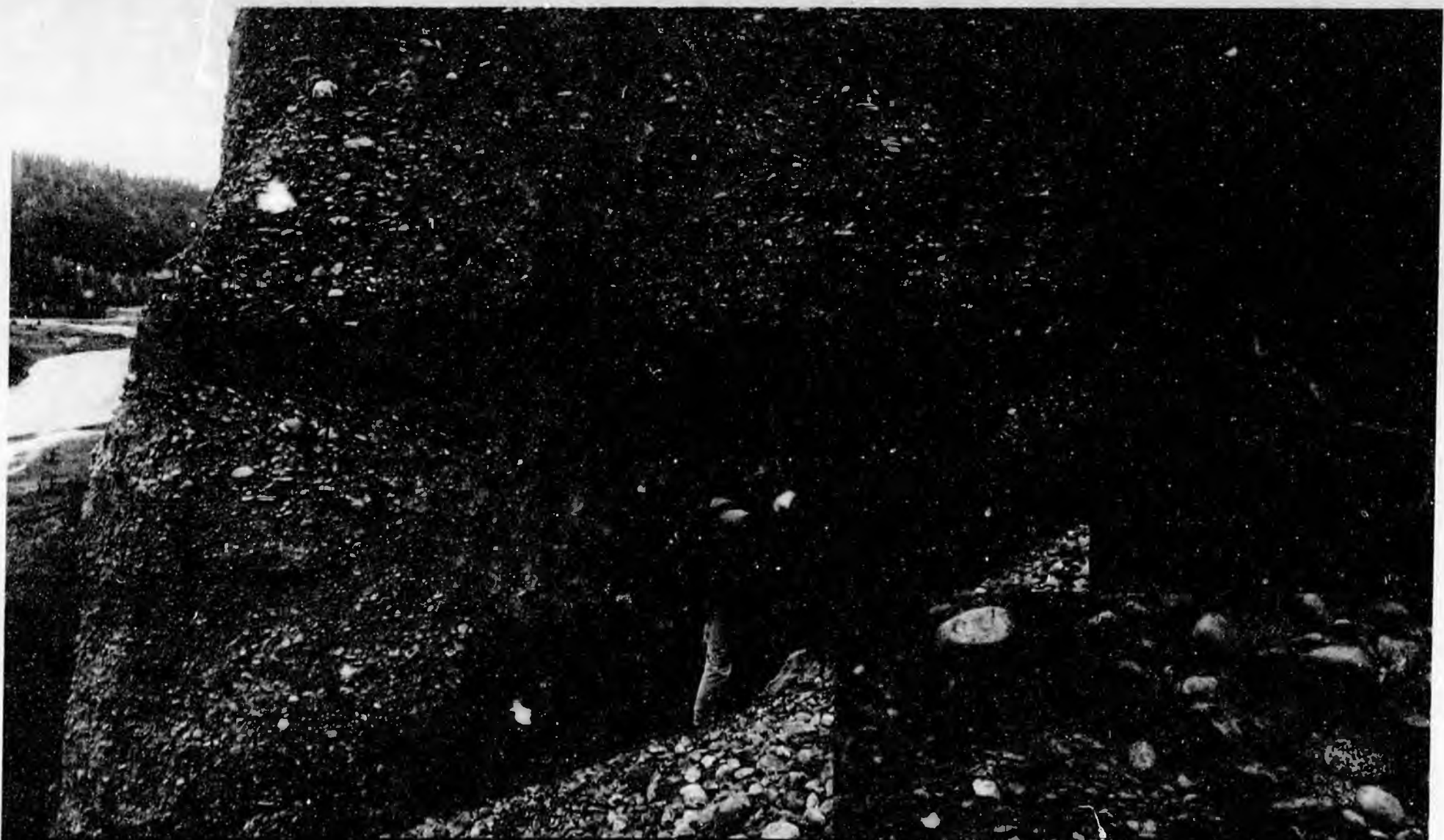


Moderate- to high  
sinuosity meandering  
fluvial system

Channels flanked by levees  
and floodplains

Anastomosed  
fluvial system






Sterling Formation (?) along the Fox River

Crudely stratified pebble-cobble conglomerates  
and lenticular sandstones

Upper Beluga Formation

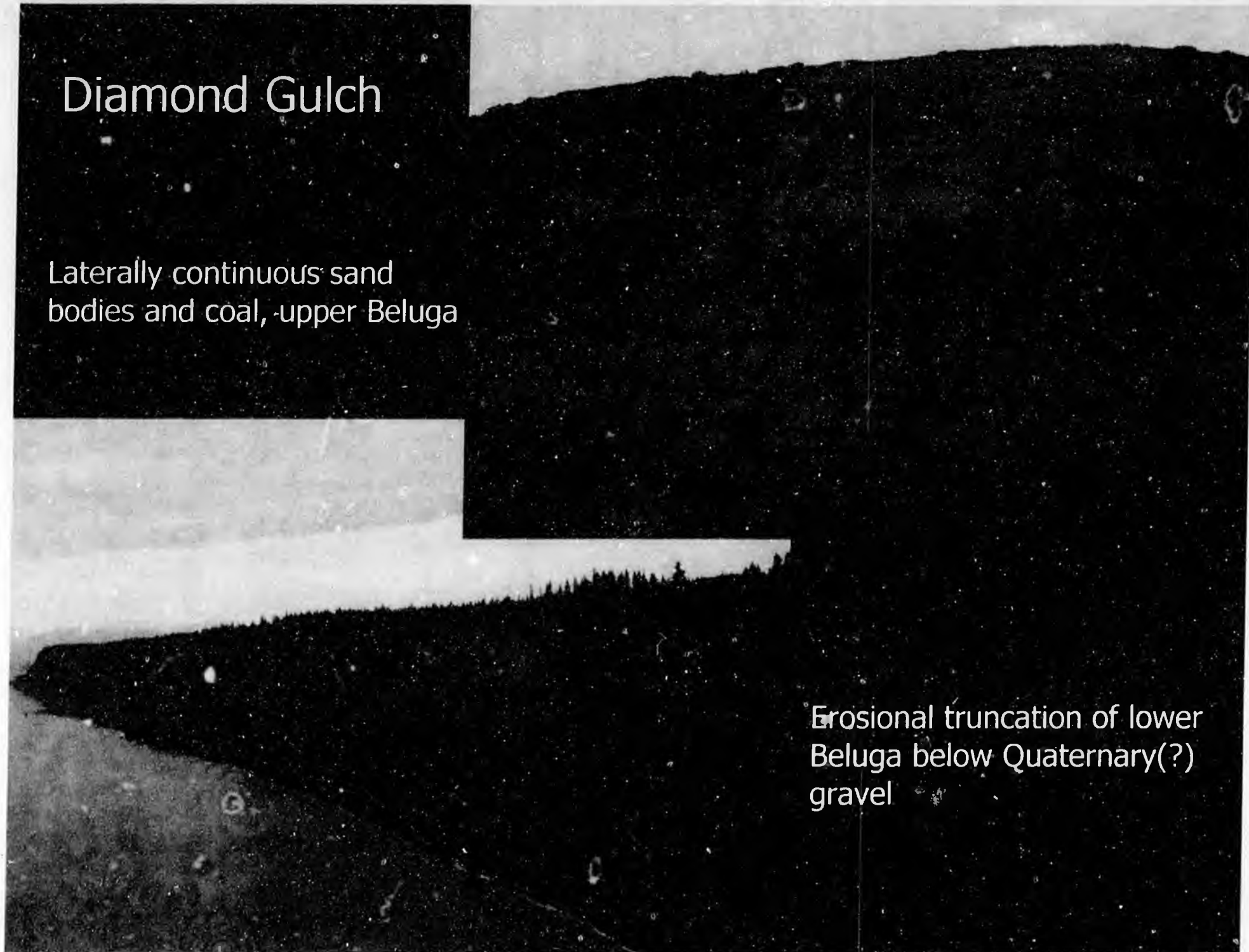


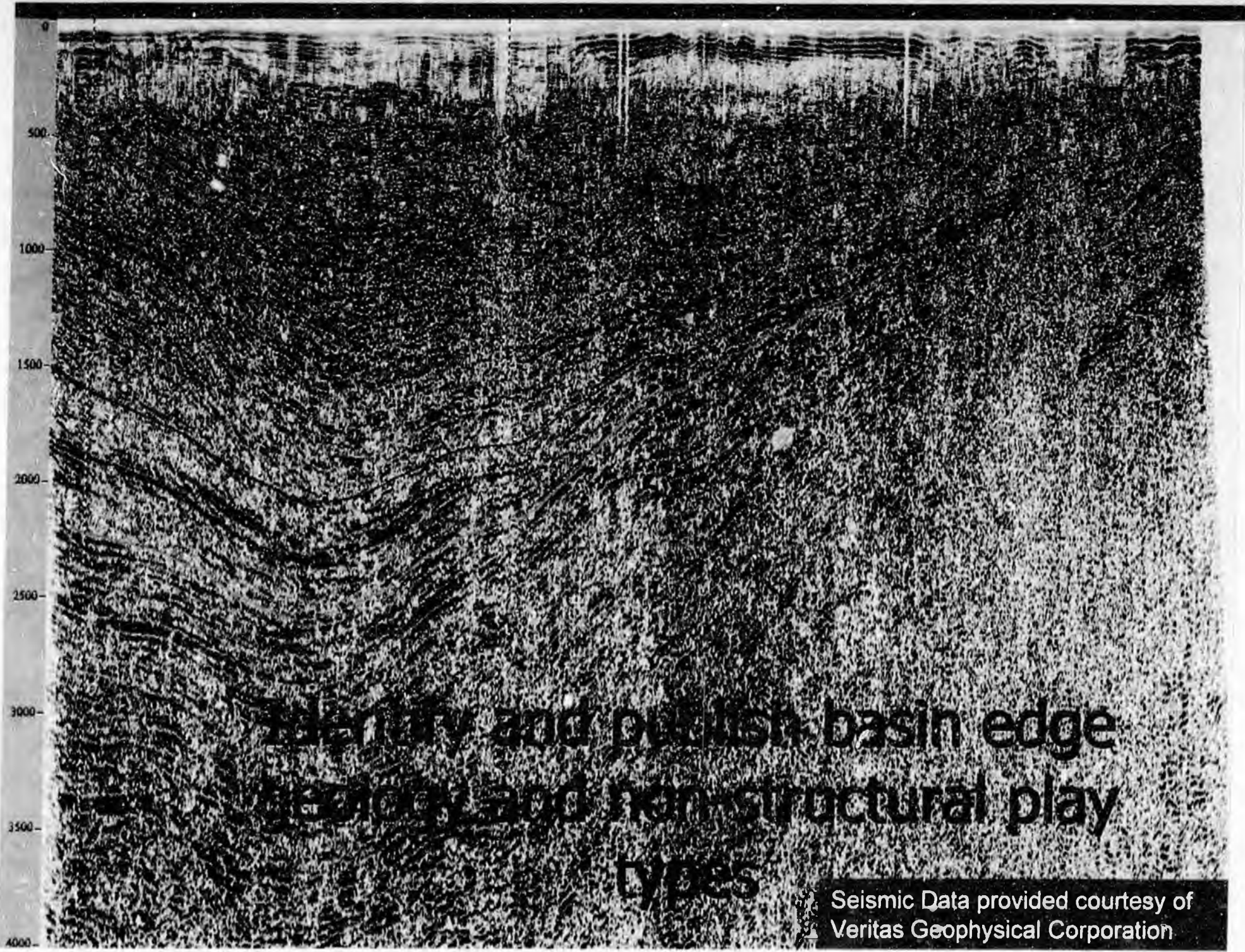
Low to moderate sinuosity sandy braided fluvial system

# Diamond Gulch

Laterally continuous sand  
bodies and coal, upper Beluga

Erosional truncation of lower  
Beluga below Quaternary(?)  
gravel





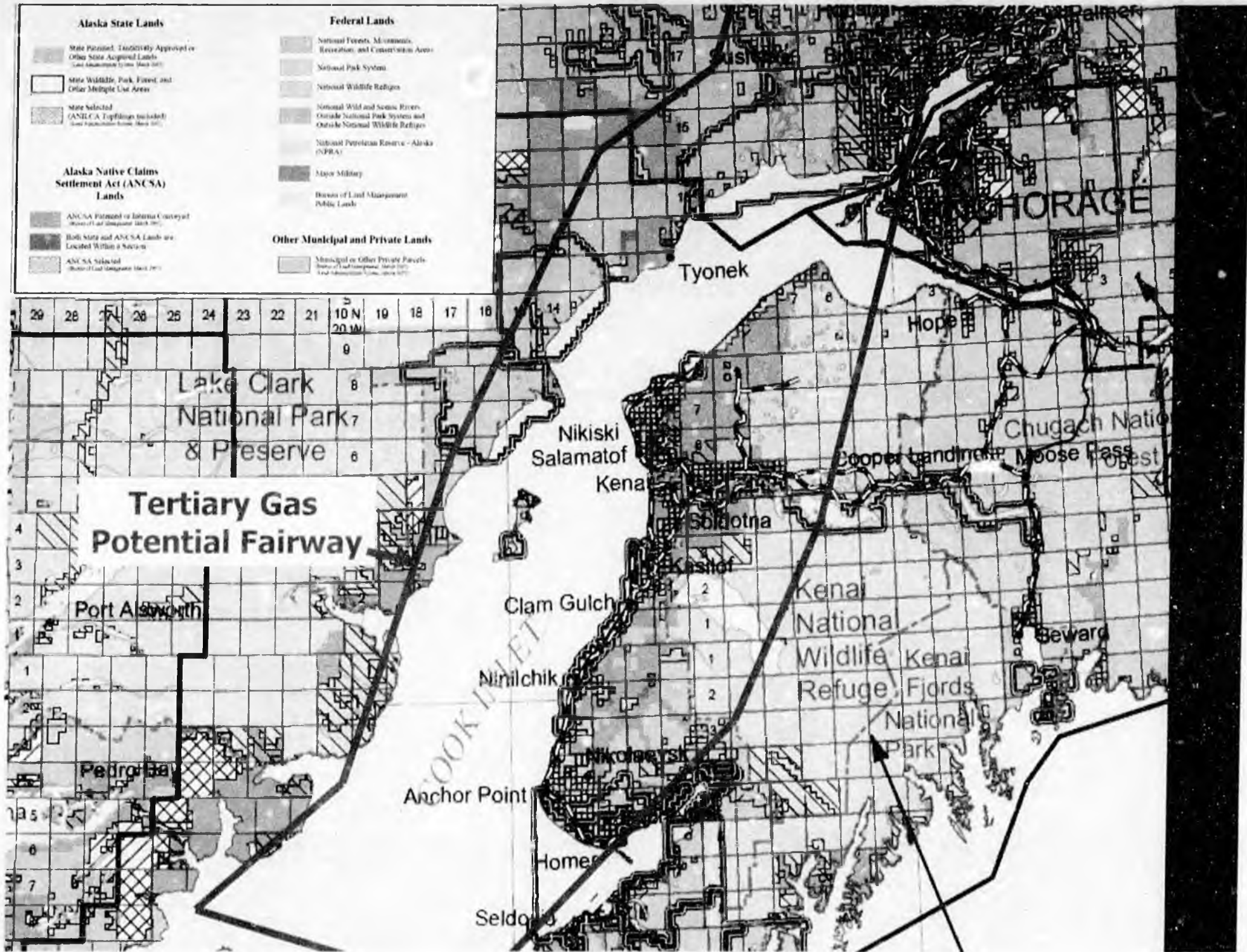
Identify and publish basin edge  
geology and non-structural play  
types

 Seismic Data provided courtesy of  
Veritas Geophysical Corporation

- ▶ All Cook Inlet Seismic data included in this presentation was provided to the state as a courtesy from **Veritas Geophysical Corporation** through an agreement with the Department of Natural Resources.

Exploration Land Picture

Alaska State Lands	Federal Lands
<ul style="list-style-type: none"> <li>State Patented, Traditionally Approved or Other State Acquired Lands (Last Acquisition System March 1971)</li> <li>State Wildlife, Park, Forest, and Other Multiple Use Areas</li> <li>State Selected (ANILCA Topfilings included) (State Acquisition System March 1971)</li> </ul>	<ul style="list-style-type: none"> <li>National Forests, Monuments, Recreation, and Conservation Areas</li> <li>National Park System</li> <li>National Wildlife Refuges</li> <li>National Wild and Scenic Rivers (Outside National Park System and Outside National Wildlife Refuges)</li> <li>National Petroleum Reserve - Alaska (NPRRA)</li> <li>Major Military</li> <li>Bureau of Land Management Public Lands</li> </ul>
Alaska Native Claims Settlement Act (ANCSA) Lands	Other Municipal and Private Lands
<ul style="list-style-type: none"> <li>ANCSA Patented or Interest Conveyed (March 1971 and subsequent March 1971)</li> <li>Both State and ANCSA Lands are Located Within a Section</li> <li>ANCSA Selected (Bureau of Land Management March 1971)</li> </ul>	<ul style="list-style-type: none"> <li>Municipal or Other Private Parcels (March 1971 and subsequent March 1971)</li> </ul>



# Cook Inlet Areawide 2006 Bids Received



Lake Clark  
National Park  
&  
Preserve

Kenai National  
Wildlife Refuge

Chugach  
National Forest

Kenai Fjords  
National Park

Cook Inlet

Anchor Point

Utechik

Klam Gulch

Chitot

Kenai

Nikiski

Tyonek

Seward

Cooper Landing

Moose Pass

Hope

Whittier

Eklutna

Big Lake

Walla

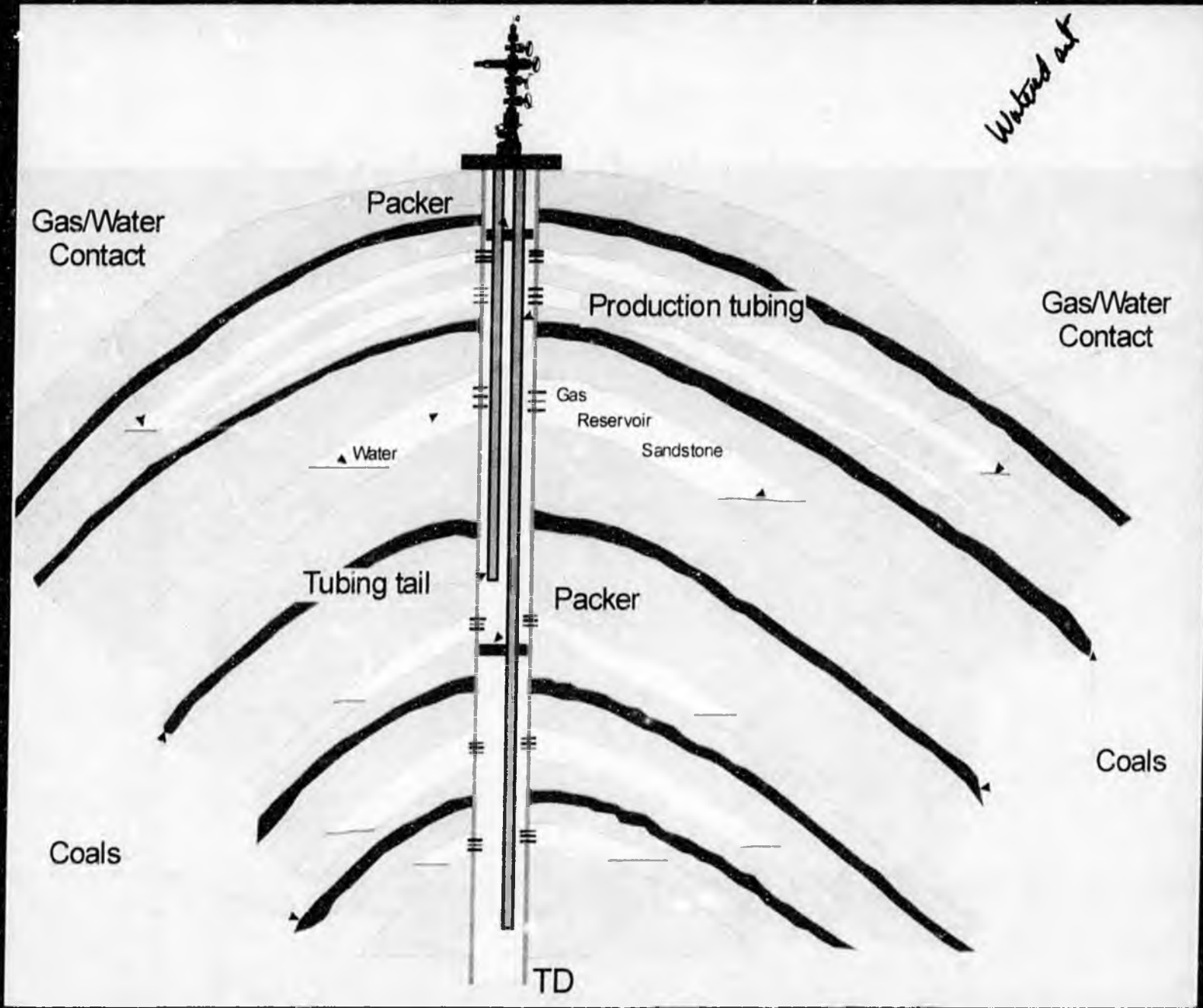
Palmer

Sustina

# Non- Conventional Exploration Gas

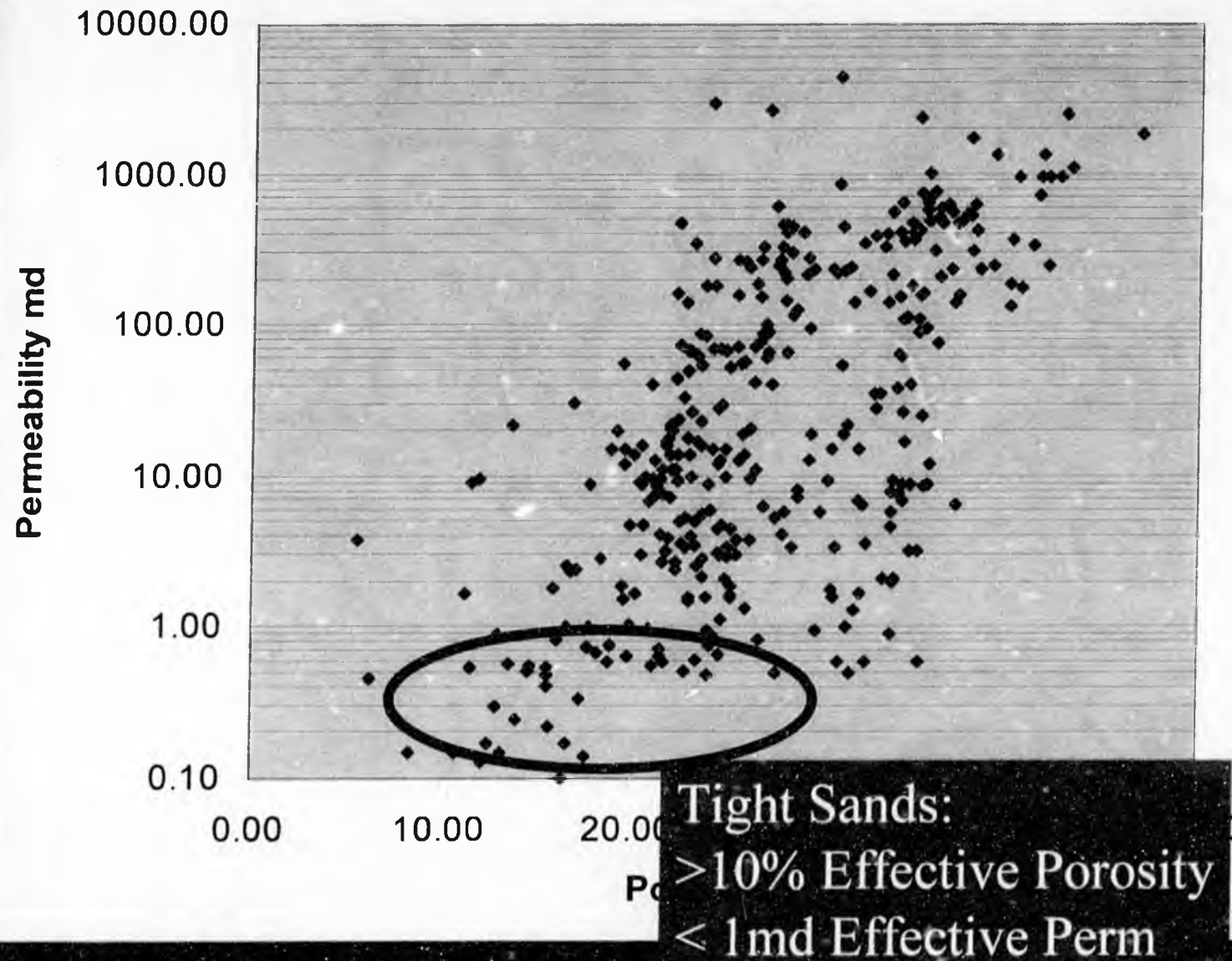
# Typical Production String Configuration

## Cook Inlet "Stacked Pay"



# Tight Gas Sands

## Porosity vs Permeability

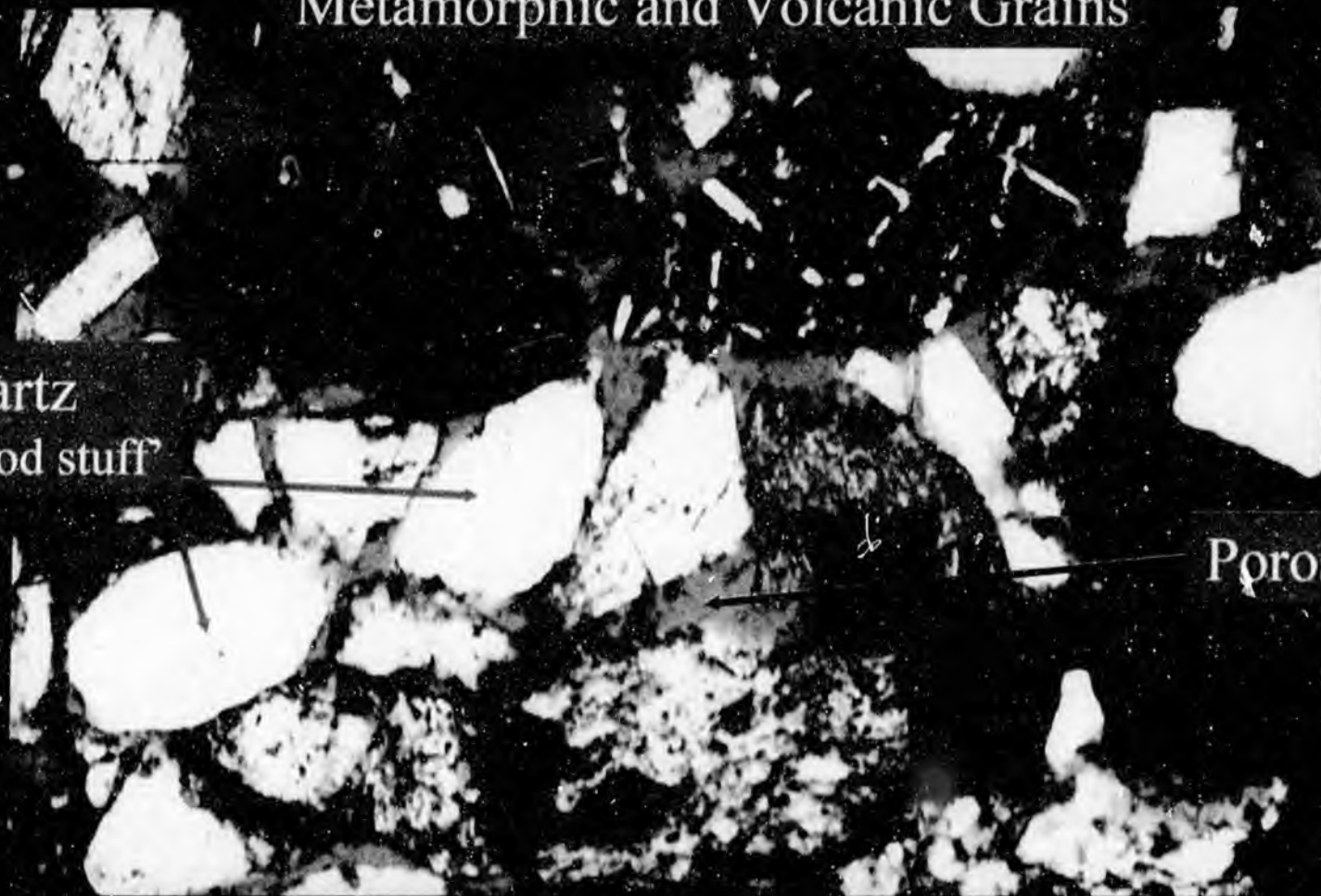


# Photomicrograph of Lithic-Rich Sandstone

Metamorphic and Volcanic Grains

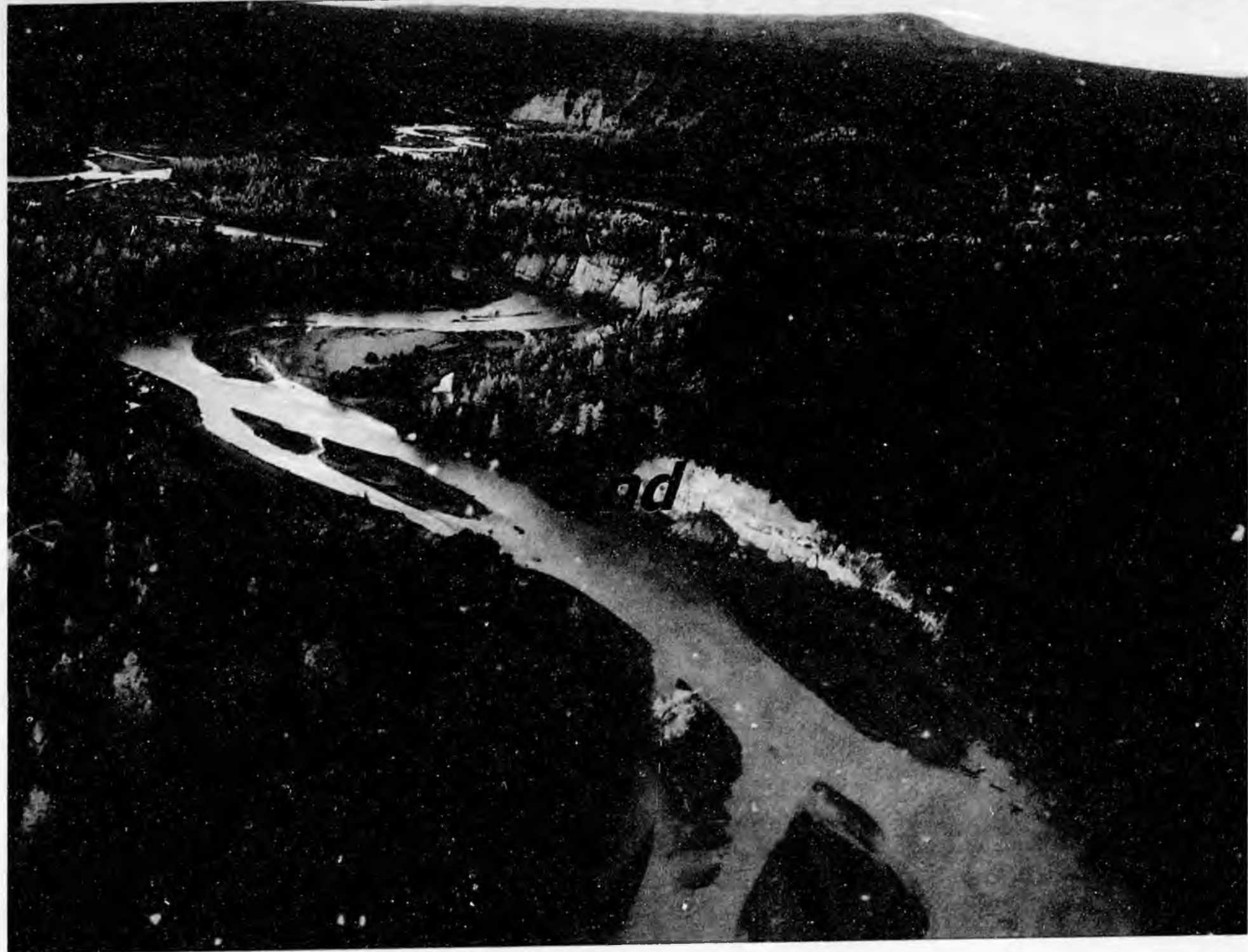
Quartz  
'The good stuff'

Porosity



# Tight Gas Sands Summary

- Most Importantly
  - Don't Despair;
    - Tight Sands Have Potential to Reservoir Significant Resource
    - 10mmcf/d from Fractured Shale Inconceivable 20 Years Ago
    - Good Data Collection is Critical
    - Sound Interpretation & Diligent Application of New Technologies



**2/14/07**

**OVERVIEW:  
PRODUCER  
OWNED  
GAS LINE**

7(i) Subsurface right ANSCA  
D

DGGS Special Report 60

for HCL Dept. of Commerce.

Office of Economic Development.

McDowell Group Inc  
Mental Health Trusts Land.

DCLD 3/21/06

Barrick - E Lin Creek -  
(used to be

Stan Fu

George Gardner, CGST

Bill Bieber

Fear. study 11/07

# ALASKA STATE LEGISLATURE

## HOUSE RESOURCES COMMITTEE

Representative Carl Gatto, Co-Chair  
State Capitol Building, Room 108  
Juneau, Alaska 99801-1182

Phone: (907) 465-3743  
Fax: (907) 465-2381  
E-mail: Rep\_Carl\_Gatto@legis.state.ak.us



Representative Craig Johnson, Co-Chair  
State Capitol Building, Room 126  
Juneau, Alaska 99801-1182

Phone: (907) 465-4993  
Fax: (907) 465-3872  
E-mail: Rep\_Craig\_Johnson@legis.state.ak.us

### Joint House and Senate Resources Committee Meeting

Wednesday, February 28, 2007

12:00 p.m. - 1:30 p.m.

Senate Finance Room 512

AGENDA

### Alaska Mining Industry Briefing By the Council of Alaska Producers

- Review of Major Mine Projects - Steve Borell, Executive Director, Alaska Miners Association
- Taxation of the Mining Industry - Karl Hanneman, President, Council of Alaska Producers
- Donlin Creek Workforce Development - George Gardner, President (retired), Chiulista Camp Services, Inc. and Bill Bieber, Operations Manager, Donlin Creek Project/Barrick Gold Corporation

ROOM  
124

### COMMITTEE MEMBERS

Representative  
Vic Kohring

Representative  
Bob Roses

Representative  
Paul Seaton

Representative  
Peggy Wilson

Representative  
Bryce Edgmon

Representative  
David Guttenberg

Representative  
Scott Kawasaki



## **ALASKA MINERS ASSOCIATION, INC.**

### **RE: Mining Industry Taxation**

February 2007

#### **Tax, Rent and Royalty History**

1. The Mining License Tax was first enacted by the Territorial Legislature in 1913.
2. 1981 - the State AG questioned state policy under Section 6(i) of the State Constitution.
3. 1981/82 - Legislature worked on modifications.
4. 1983 to 1987 - litigation over the 6(i) issue.
5. 1987 - Alaska Supreme Court ruled rents or royalties are required.
6. 1989 - Legislature enacted **both rents and royalties**.

#### **Taxes presently paid in Alaska by the mining industry**

1. Since statehood, the mining industry has been targeted to pay a "special" tax called the Mining License Tax (MLT). This is a 7% net profits tax that applies to all mining operations regardless of land ownership. **This MLT is over and above the corporate tax applied to other industries.**
2. On State land, an additional 3% Net Profits Production Royalty is paid.
3. Claim rentals are paid on state and federal lands.
4. Alaska Corporate Income Tax at 9%.
5. Payments to local governments - for property taxes, sales taxes, direct payments, payments in lieu of tax, etc.

#### **Observations**

1. There are **only five large mines** (Usibelli, Greens Creek, Red Dog, Ft Knox, and Pogo) and **one intermediate mine** (Nixon Fork) operating in Alaska. Kensington and Rock Creek are in construction but at both of these projects the Corps of Engineers is being sued over wetlands permits the agency has issued.
2. **In order to significantly increase tax revenue from the mining industry, Alaska needs more large mines.**
3. The mining industry worldwide, including Alaska, is experiencing a period of growth and increased investment. This has been due primarily to **improved metal prices**, which can be

volatile. Improved prices have resulted in increased exploration activity, development of some projects, and new investments are being made in the state.

4. **Metal prices are cyclic and will swing the other way at some point in time. Metals are a commodity and prices are established by world markets and tax increases go directly to the bottom line and reduce the viability of projects. There is no possibility to pass on any tax to the customer.**
5. **Alaska has a progressive tax structure for mining. When the miner is successful the State is also successful and shares in that success.**
6. **Under current tax policy, when metal prices decrease, mines will continue to operate longer before being idled and thereby provide added stability to local communities by maintaining the jobs.**
7. **Mines are very capital intensive. New operations can take 5 to 15 years from exploration to first production, and possibly longer, with large amounts of money spent on exploration, environmental studies, mine design, etc. (Kensington - >\$150 million over 16 yr period and still no production; AJ - >\$100 million and then closed and reclaimed with no production.)**
8. **Historically, the worldwide mining industry has averaged about a 5% return on investment, significantly below other major industries in Alaska. Due to these low rates of return, a net profits tax is the only type of tax that can be paid on a sustainable basis.**
9. **The mining industry supports paying its fair share and is now paying higher taxes through the mining license tax.**
10. **Mining represents the greatest source of private employment and local revenue in many parts of rural Alaska and this directly off-sets State contributions and provides the basis for these areas to become self supporting.**
11. **Mining companies have invested in Alaska because of its stable tax and regulatory climate. They have made their decisions based on this situation. In order to continue attracting investment to Alaska, the industry needs this tax stability.**
12. **Mineral development has the greatest opportunity for future economic activity in many parts of rural Alaska. In much of rural Alaska mineral development may be the only opportunity for creating new, quality, local jobs.**



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## Issues of Concern to the Alaska Mining Industry for 2007

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It is the position of the Alaska Miners Association that:

February 2007

### FISCAL ISSUES

1. **State Fiscal Policy** - The Governor and Legislature adopt a long range fiscal plan and a biannual budget cycle. And provide effective funding for the minerals and permitting functions in the Department of Natural Resources, the Department of Community & Economic Development, and the Department of Environmental Conservation.

2. **Annual Airborne Geophysical Mapping Program** - The Legislature and the Governor accelerate the extremely effective program of State investment in airborne geophysical mapping along with water quality mapping.

3. **Baseline Water Data** - The Legislature accelerate funding for collection of baseline water information, focusing on areas where resource development is anticipated.

4. **Mineral Education** - The Legislature continue to support mining engineering and geological engineering at UAF, and geology programs throughout UA at levels that will ensure continued accreditation, as well as the Delta Mine Training Center (DMTC) and the Mining and Petroleum Training Service (MAPTS).

5. **AMEREF (Alaska Mineral & Energy Resources Education Fund)** - The Legislature continue funding of the State's share of this program in the public schools.

### LAND MANAGEMENT ISSUES

6. **State Lands** - The Governor and the Legislature support **no net loss of multiple use** lands and require that additions to any state parks, refuges, critical habitat areas, marine restricted areas, or any other restricted-use areas, or transfer of state land to federal ownership, be made **only if** an equal acreage of other lands already having the same designation is released and the new area being designated is **first evaluated for mineral potential**.

7. **Land Transfers** - Prior to any state land transfers to boroughs, **land disposals/sales**, or leases not required for resource development, require a detailed mineral evaluation, to include airborne geophysical surveys, be completed to help ensure that mineralized lands or key access routes are not transferred.

8. **Outdated Federal Withdrawals** - The State pursue removal of old federal land withdrawals (where purpose for withdrawal has expired) which are blocking land transfers to the State, *such as PLO 5150, the outer pipeline corridor*. Encourage BLM to remove such PLOs and open the lands through its land planning process.

9. **Evaluation of State Land Selections** - The Administration continue to pursue land transfers with special emphasis on high value resource lands and lands required for access rights-of-way.

10. **New Federal Withdrawals** - The Governor and Legislature oppose all new federal land withdrawals, roadless initiatives, marine restricted areas, Antiquities Act designations, BLM wilderness studies, etc. and fight vigorously against additional buffers or other restrictions to multiple use of federal lands in Alaska. The Alaska National Interest Lands Conservation Act (ANILCA) provides that "no more" federal land will be withdrawn for parks, preserves, monuments, wilderness designations, wild & scenic river designations, etc.

11. **International Heritage & Biosphere Designations** - The Governor vigorously oppose establishment of international parks, biosphere reserves, and world heritage sites, such as the so-called Beringia (over the Seward Peninsula & Bering Sea), NPRA, or ANWR. International designations would - 1) surrender partial sovereignty to the United Nations, and 2) forever eliminate access across the affected lands and waters.

12. **Federal Mining Law Issues** - The Governor continue to oppose changes to federal law and regulations that would be adverse to Alaska miners.

## ACCESS ISSUES

13. **Roads** - The State continue investing in the *roads to resources* program and construct new roads.

14. **Railroads** - The State continue work to define rail layout from the northwest Arctic to a deep water port on Norton Sound and from Eielson AFB to Delta Junction and on to Canada.

15. **Ports** - The State continue development of new/expanded ports at Red Dog, Nome, Cordova, Iniskin Bay, and elsewhere.

16. **RS-2477 Rights-of-Way** - The Administration continue to systematically and aggressively pursue the rights of the State of Alaska regarding RS-2477 rights-of-way, both administratively and in the courts, and that the Legislature provide funding to ensure this is done. Without RS-2477s much of Alaska public lands will never have overland access.

17. **Navigability** - The Administration continue to aggressively pursue recognition of State ownership of all navigable waters granted under the Statehood Act, including the North Fork and Mosquito Fork of the Fortymile River.

## OTHER ISSUES

18. **Integrity of Permit Systems** - The Legislature and Administration ensure the integrity of the permit system.

19. **Non-Profit Foundation Money** - Legislation be enacted to require disclosure whenever funds from out-of-state 501(c)(3) foundations are given to Alaska non-profits, to include name of the source, amounts and purpose for which the moneys are given.

20. **Water Quality** - The State continue to revise water quality standards to ensure: 1) availability of **mixing zones**, 2) they are scientifically and technically supportable, 3) they are developed using Alaska-specific criteria, and 4) they are sufficient to protect water quality and support State implementation.

21. **Air Quality** - The State clarify and simplify the air quality regulations. The State utilize third party contractors where possible while maintaining a core staff of State employees to manage the effort.

22. **Jones Act** - Because Jones Act vessels for bulk

mineral shipments are not available, the Governor and Legislature should petition Congress to amend the Jones Act to allow use of non-Jones Act vessels for shipment of "*non-petroleum bulk natural resources from Alaska*".

23. **National Environmental Policy Act** - The Administration and Legislature should petition Congress to establish sideboards on the NEPA process and return it to the original intent of the law. NEPA is the single greatest impediment to project permitting.

24. **Wetlands** - The Administration and Legislature should petition the Bush Administration to develop regulations that strictly follow the U.S. Supreme Court decision in SWANCC.

25. **Endangered Species Act/Essential Fish Habitat** - The Administration and Legislature should petition the Bush Administration to develop new ESA and EFH regulations that strictly follow the original intent of these laws.

For further information on the above issues or for information regarding exploration and mining in Alaska please contact:

Steven C. Borell, P.E.  
Executive Director  
Alaska Miners Association, Inc.  
3305 Arctic Blvd., #105  
Anchorage, AK 99503  
907-563-9229 Ofc  
907-563-9225 Fax  
sborell@alaska.net  
www.alaskaminers.org



2/28/07 HRes - ANGLA

→ Steve Pratt - Regulatory - FERA  
\$5 million request fm. legislature.

[Will require - owners to pay state  
back -

~~Inter~~ Interaction w/ Port Authority -

ANGLA - State Authority -

AGL Port Authority - muni. Authority -

MOU -

Federal loan guarantee - might be eligible  
effective way to do that.

# Alaska Gas Market System (AGMS)



**ANGDA** — *"Connecting Alaskans To Their Natural Gas"*

⊕ → Focus on South central gas avail.  
Steve Peatt - Reg. matters.  
Jane Withm

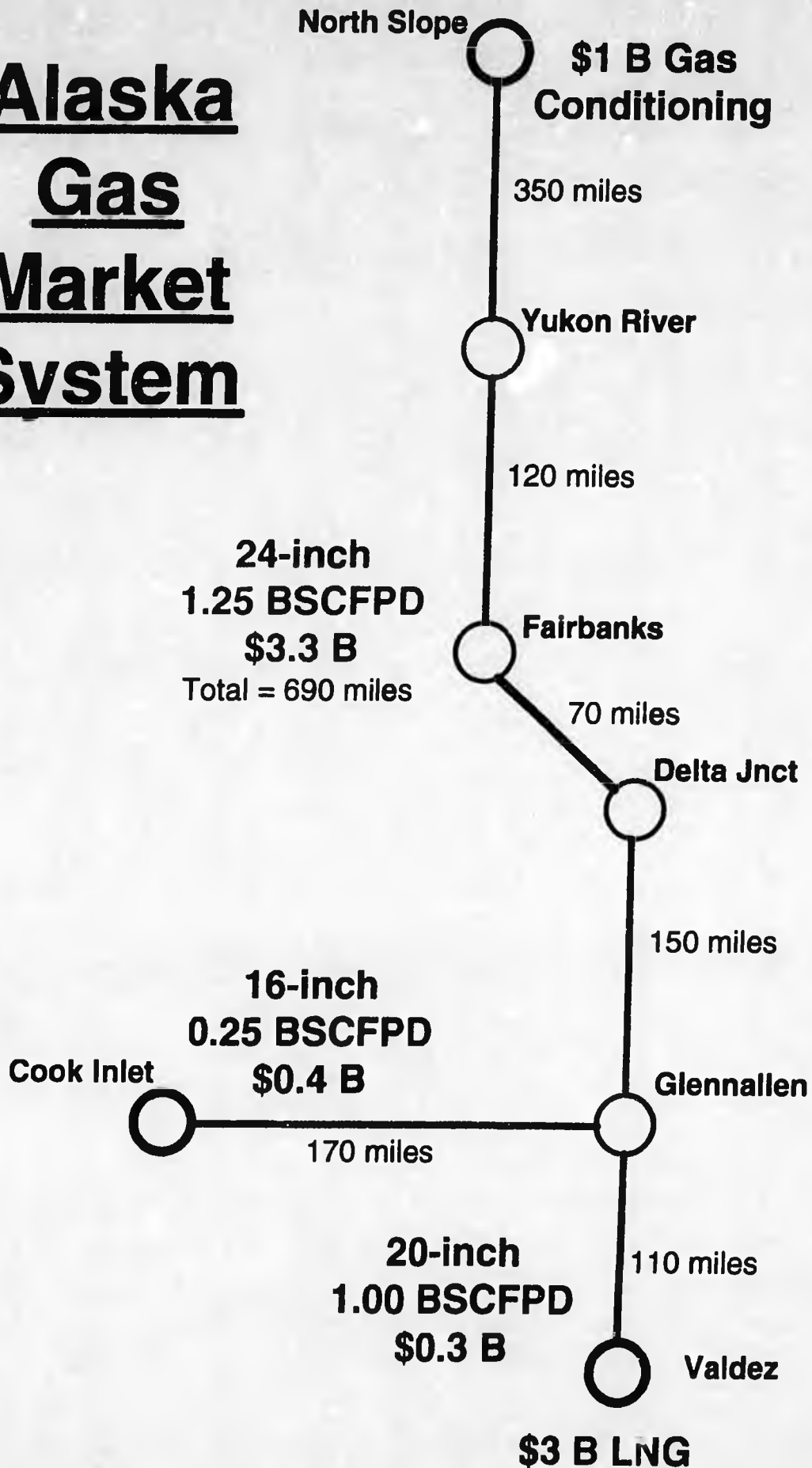
## Alaska Natural Gas Development Authority

[www.angda.state.ak.us](http://www.angda.state.ak.us)  
[www.jpo.doi.gov/ANGDA/ANGDA.htm](http://www.jpo.doi.gov/ANGDA/ANGDA.htm)  
[www.allalaskaing.com](http://www.allalaskaing.com)

For Further Information Contact:

Harold Heinze  
411 W. 4<sup>th</sup> Ave, Anchorage 99501  
(907) 257 - 1347  
hheinze@jpo.doi.gov

# Alaska Gas Market System



## Elements of AGMS

- Gas pipeline is high pressure and buried
- Prudhoe Bay to Glennallen is 24-inch with 20-inch to Valdez & 16-inch to Cook Inlet
- LNG plant produces 7 mmtpa (1 BSCFPD) from 2 trains
- Gas conditioning on North Slope removes CO<sub>2</sub> (EOR use) & blends NGL's (ethane / propane)
- Cook Inlet terminus in Beluga Gas Field for storage (levels seasonal variations)
- Utility gas take-off points and propane wholesale facilities along route

Methane, butane.  
level - tariff -  
take off points -

plenty of supply -  
stability of supply -

## Throughput & Cost & Tariff

- NS offtake is 1.25 BCFPD with 0.25 BCFPD to Cook Inlet & 1.0 BCFPD to Valdez LNG
- Pipelines are \$4 B, NS gas conditioning is \$1 B, and Valdez LNG plant is \$3 B (benchmark estimates)
- Expect tariff to Cook Inlet to be less than \$2 per mmbtu (Chicago is \$2.50)
- Tariff to Valdez less than \$1.50 per mmbtu and total cost to LNG destination less than \$4 per mmbtu

Major LNG  
companies  
2 - want  
access to  
Alaska gas

PRIVATE ENTERPRISE -  
commercial enterprise

## **Reserves & Financing**

- **Financing basis would be 10 TCF of committed reserves**
  - State 3 TCF plus one-producer 7 TCF
  - State 3 TCF plus all Point Thomson at 8 TCF
  - State 3 TCF plus new discoveries of 3 TCF
- **LNG plant would be built and owned by LNG companies with existing tanker fleet and delivery sites**

## **Partners We Can Expect**

- **Oil & gas companies (including “producers”)**
- **Pipeline companies**
- **LNG plant and ship owner / operators**
- **Experienced energy project investors**
- **Local Alaska utilities (gas & electric)**
- **State of Alaska**
- **US Federal Government**

***No speculators or saboteurs***

## Markets

- Cook Inlet and Interior utilities (gas & electric)
- Propane for use in coastal, river, and highway communities
- Valdez LNG for shipment to US & other Pacific Rim regas facilities
- Cook Inlet industrial and petrochemical plants

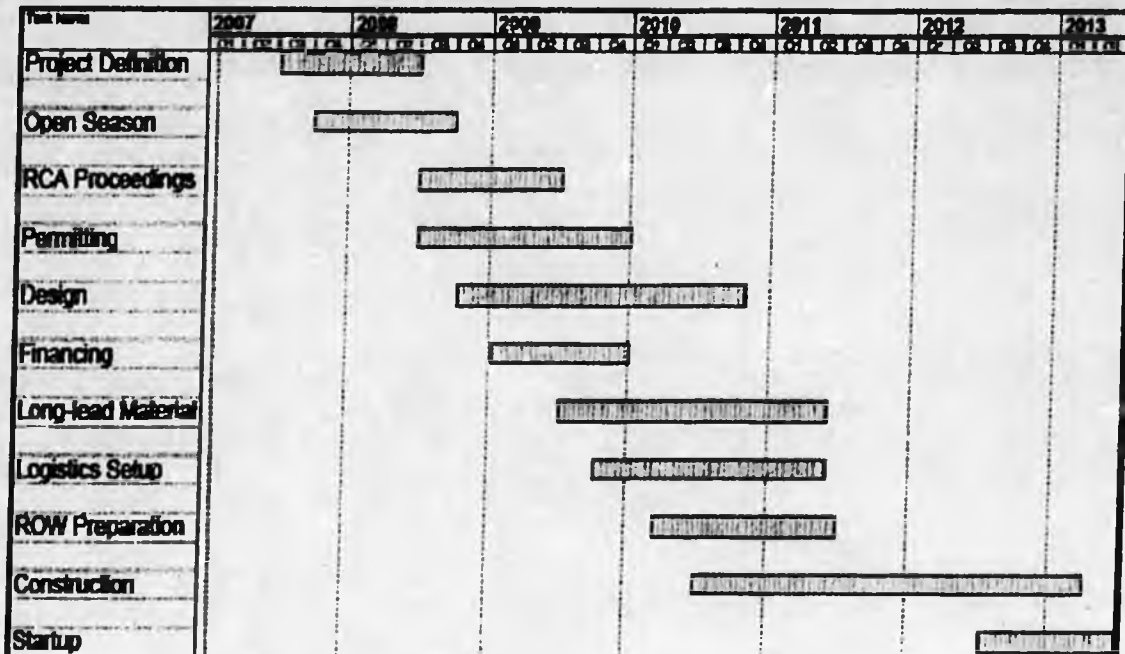
*3 companies:*

*B.G., Sampra, Mitsubishi -  
Large fleets of LNG ships*

## Project Timeline

- Six years to first gas delivery
- Three year construction period
- LNG facility will be constructed as a separate project
- Gas delivery can be started before gas conditioning & LNG facilities available
- North Slope gas conditioning may be a Prudhoe Bay Unit or pipeline facility

# Tasks & Timeline



*Negotiated open season early in the timeline.*

*W. - State's \$? modest<sup>\$/</sup>stable supply -*

## Joint-Work Process

- Covers the definition phase
- Voluntary and Non-exclusive
- Participant contribute in-kind expertise
- At least two major work effort teams (pipelines & LNG)
- Full time team leaders
- Steering committee open to all participants (summary info is public)

STATE OF ALASKA

**ALASKA NATURAL GAS  
DEVELOPMENT AUTHORITY**

**SARAH PALIN, GOVERNOR**

411 WEST 4<sup>th</sup> AVENUE, FIRST FLOOR  
ANCHORAGE, ALASKA 99501

TELEPHONE: (907) 257-1347

February 26, 2007

**WORK PLAN & FUNDING REQUIREMENTS TO ADVANCE THE  
Alaska Gas Market System (AGMS) PROJECT**

The AGMS work plan objective is to provide within one year a project description sufficient for producers, pipe-liners, LNG manufacturers & shippers, and customers to make a decision on:

1. a formal application to the State of Alaska under the AGIA RFP,
2. an "open season", and
3. financial commitments to proceed with design and permit applications.

**JOINT-WORK PROCESS**

ANGDA proposes that the project definition phase of the AGMS be conducted as "joint-work" with any interested parties capable of contributing expertise as participants. ANGDA would provide the funding and working with others select contractors to define the technical parameters needed in the design. All participants would be expected to "contribute" experts to share in the contractor guidance and task reviews.

There are several major technical and business work areas in the project definition phase of the AGMS. While this work needs to be coordinated and integrated, there may be a separate group of experts and contractors for each effort. Ideally, a full-time study leader would be available from the participants experts to be the daily point of contact with contractors for the more dynamic tasks.

A steering committee open to management / project representatives of the participants would meet at regular intervals to review progress and discuss further work requirements.

ANGDA has office space and computer connection resources immediately available for a central work location of a few participants.

## PLAN DEVELOPMENT COSTS

A one to two year funding of approximately \$5 million would be required. This presumes a substantial in-kind commitment of technical staff by the participants; including the salary and expenses of their company's project personnel. In addition to funding contractor work, ANGDA would be providing in-kind the administrative costs of contractor management and result publication.

Identification of specific work tasks will be the first major effort of the joint-work participants. To illustrate the range and complexity of Phase I tasks, a draft task-matrix was constructed by Shaw Alaska in concert with a variety of former and current ANGDA contractors (see Shaw Alaska transmittal letter).

The attached Shaw Alaska compilation describes a matrix of 80 tasks within 10 major Project Evaluation Areas. The budget level cost estimate for this work exceeds \$10 million. The joint-work participants will prioritize the efforts to stay within the appropriated funding. Some tasks will be largely accomplished through information contributions and in-kind expert efforts of the participants.

## CONFIDENTIALITY

While the use of some proprietary technologies may require confidentiality protection, the joint-work goal is to make as much of the results available publicly as possible. Participants will have the advantage of being part of the detail analysis, but summary presentations at the steering committee level would be public.

## POTENTIAL PARTICIPANTS

- Oil & gas companies currently producing or exploring in Alaska including the major Prudhoe Bay lease holders.
- Pipeline companies
- LNG manufacturing, shipping, and/or marketing companies
- Experienced energy project investors
- Alaska utilities
- State of Alaska
- US Federal Government





Shaw Alaska, Inc.

2000 W. International Airport Road,  
Suite C-1  
Anchorage, Alaska 99502-1116  
Phone: 907-243-6300

February 26, 2007

Harold Heinze  
CEO  
Alaska Natural Gas Development Authority  
411 West 4<sup>th</sup> Avenue, First Floor  
Anchorage, Alaska 99501

Re: Phase I Alaska Gas Market System Task Matrix

Dear Mr. Heinze:

Please find attached a working level draft of a **Phase I Alaska Gas Market System Task Matrix**. This Matrix was prepared by Shaw Alaska, Inc. under ANGDA Contract No. 06-0408. This work was performed in concert with various ANGDA contractors and consultants as part of your proposed "joint-work process". A listing of these contributors is enclosed as Attachment A.

We have collectively identified 10 major Project Evaluation Areas with 80 key technical, program management, economic, regulatory, institutional and legal tasks to be undertaken over the next 1 to 2 years. A table summarizing these Project Evaluation Areas and Tasks and associated budget cost estimates is enclosed as Attachment B. The **Phase I Alaska Gas Market System Task Matrix** is enclosed as Attachment C.

It is expected that the successful conduct of these Project Evaluation Areas and Tasks will advance AGMS to the next level and allow the project to proceed to an 'open season'. It is expected that follow-on work will continue to be accomplished through the "joint-work process".

We look forward to supporting AGMS going forward.

Sincerely,

Shaw Alaska, Inc.

Jane Whitsett, Office Director

## Attachment A

### Listing of Contributors

<b>Contributor</b>	<b>Affiliation</b>
Kaye Laughlin	ENSR
Bill Popp	Kenai Peninsula Borough
Steve Pratt	ANGDA
Brad Barta	Shaw Stone & Webster, Inc.
Carolyn Dunmire	Dunmire Consulting
OD Odsather	ANGDA
Alan Christopherson	PND
Dempsey Thieman	PND
Joe Griffith	ANGDA
Tony 'zzo	ANGDA
Pat Athey	Shaw Alaska, Inc.
Patrick Burden	Northern Economics, Inc.
Jane Whitsett	Shaw Alaska, Inc.
Joe Petrillo	Shaw Alaska, inc.
Cal Kerr	Northern Economics, Inc.
Keith Darby	Shaw Stone& Webster, Inc.
Sue Garven	Shaw Stone& Webster, Inc.

**Attachment B**

<b>Project Evaluation Areas</b>	<b>Number of Tasks</b>	<b>Cost (\$MM)</b>
Project Scope and Description - Pipelines	9	\$1,410
Project Scope and Description - LNG	10	\$1,135
Project Scope and Description - Gas Conditioning Plant	5	\$850
Project Scope and Description - NGLs	5	\$385
Market Analysis and Needs Assessment	12	\$1,300
Project Management Plan	6	\$900
Preliminary Economic Analysis (Cost and Tariffs)	5	\$475
Reserves and Financing	10	\$1,100
Regulatory, Permitting, Legal and Stakeholder Requirements	12	\$1,585
Key Issues, Risks, Uncertainties and Opportunities	6	\$1,300
<b>Totals</b>	<b>80</b>	<b>\$10,440</b>

## Attachment C Phase I AGMS Task Matrix

	<b>Marine Traffic Study</b>	Undertake a marine traffic study to evaluate the viability of safely handling existing and projected oil traffic with the projected LNG carrier traffic. Assume both 125,000 and 250,000 cubic meter capacity LNG carriers and 24-hour turnaround.	\$125,000
	<b>LNG Loading facility requirements</b>	Evaluate operating requirements for QMAX LNG carriers on berth at the proposed LNG site.	\$50,000
<b>Project Scope and Description - Gas Conditioning Plant</b>			<b>\$850</b>
	<b>Develop GCP Project Definition Document</b>	Develop GCP Project definition document to include high-level design criteria, size, site location (s), infrastructure availability, permitting and regulatory information (from subsequent tasks) as well as site-specific project execution information (from subsequent tasks). This will also be used to support the regulatory and permitting process.	\$150,000
	<b>North Slope Gas Off-Take</b>	Establish Allowable North Slope Gas Off-Take. Obtain definitive timeline, analysis from AOGCC estimating the impact of AGMS gas off-take has on hydrocarbon recovery in the PBU. Consider alternatives for CO2 and water reinjection rather than dumping NGL's back down hole.	200,000
	<b>Define GCP Design Basis</b>	Based on initial market assessment, define delivered gas quality requirements. Also review the work that has been undertaken to date and summarize study results.	\$50,000
	<b>Prepare Conceptual Design for the Pipeline Gas Treatment Facility at PBU</b>	Develop a conceptual design for conditioning gas to remove water to very low levels (3#s per MMacid), and CO2, N2, Mercury and H2S if existing in the gas stream. Establish an optimum size for the conditioning train based on modularization. Develop gas export specification that should be attractive to a LNG Baseload plant owner/user. Establish an order of magnitude cost estimate for a 1.25 BCFPD and 2.25 BCFPD plant.	\$200,000
	<b>Gas Treatment Plant (GTP) Site Evaluation</b>	Prepare a preliminary GTP site evaluation including location, site plan, logistics, supply & transportation of gas, quality of raw material, schedule for facility construction.	\$250,000
<b>Project Scope and Description - NGLs</b>			<b>\$385</b>
	<b>Summarize previous ANGDA NGL Market Studies</b>	Summarize all ANGDA studies related to NGL.	\$10,000
	<b>Develop NGL Project Definition Document</b>	Develop NGL Project definition document to include high-level design criteria, size, extraction takeoff location(s), infrastructure availability, permitting and regulatory information (from subsequent tasks) as well as site-specific project execution information (from subsequent tasks). This will also be used to support the regulatory and permitting process. This document should identify potential partners, that have resources, technical capabilities, financial capacity, and political strength.	\$100,000
	<b>Determine NGL Quantities and Qualities</b>	Conceptual analysis to confirm quantities and qualities of NGL's. Much of the information will come from the hydraulic pipeline studies (pigging frequency, NGL quantities for varying gas compositions and pressures), and GCP conceptual design.	\$100,000
	<b>Evaluate NGL Markets and Develop Optimal Extraction Locations</b>	Review existing market studies and conduct further analysis to quantify short term and long term markets. Combine Market demand analysis for NGL (locational based e.g. Yukon, Fairbanks, Anchorage) with above study to determine NGL extraction locations along pipeline route.	\$150,000
	<b>NGL Project Conceptual Design</b>	Develop a conceptual design for NGL alternative locations.	\$25,000
<b>Market Analysis and Needs Assessment</b>			<b>\$1,300</b>
	<b>Review previous ANGDA Market and Needs Studies</b>	Review all ANGDA studies and Business Plan related to AGMS market assessments.	\$50,000
	<b>Standard Design for Utility Takeoff</b>	Standard design and specification for utility hook ups to the gas transmission line.	\$50,000
	<b>Gas Reserves Estimate</b>	Develop a third party estimate of known reserves and range of uncertainty.	\$50,000
	<b>Rank AGMS Task Within Integrated Energy Plan for Alaska</b>	Evaluate and Rank AGMS within current long term energy plan and strategy for Alaska.	\$100,000
	<b>Review Gas Supply and Demand Forecasts in the Cook Inlet Region</b>	Evaluate Cook Inlet region utility, industrial and residential. Identify and optimize peak requirements and service options. Compile utility, industrial and residential gas consumption forecasts. Synthesize Cook Inlet Energy Market Information, Outlook for Consumers. AGMS Impact Review ANGDA Bus. Plan and documents to date. Demonstrate how AGMS can resolve issues raised by the Gap Chart and deliverability issues. Reconcile Impact of AGMS on Cook Inlet gas market, exploration/production incentives and options.	\$150,000

## Attachment C Phase I AGMS Task Matrix

Review Propane distribution use along coastline, highways and rivers	Build on existing studies to assess LPG market in Alaska, especially delivery to remote villages. Evaluate costs, volumes, and deliverability for LPG. Compile recent studies on potential LPG market, update and fill-in data gaps as needed. Evaluate potential partners and distributors necessary to ensure the success of this operation.	\$100,000
LNG export Markets	Evaluate LNG export markets in Pacific Rim.	\$150,000
Evaluate the potential for establishing a petrochemicals industry in Alaska	Evaluate the potential to develop a petrochemicals industry in Alaska at various site locations. Identify optimal locations based on pipeline takeoff points, critical infrastructure requirements, and potential markets in the Pacific Rim.	\$50,000
Determine the technical and economic feasibility of gas storage options in the Cook Inlet Region including the Beluga Gas Field	Coordinate efforts with ConocoPhillips, ML&P, Chevron, Enstar, Chugach Electric and Marathon.	\$400,000
Coordinate market assessment and needs issues with RCA, AOGCC et al	An important part of the business plan. Leads to issues and resolutions with potentially RCA, AOGCC, etc. Expand the study made and narrow into the cost centers that will enhance service to the communities and bring value added to our citizens plus money to the STATE.	\$50,000
Effect of Blue Sky project on demand for natural gas in Cook Inlet	Assuming the Blue Sky project is built as recently described, evaluate effect on gas demand in southcentral Alaska. At present, the Blue Sky project would provide all of the gas needed by Agrum and supply a portion of electricity used in southcentral Alaska.	\$50,000
Identify propane business plan for rural Alaska energy needs	Identify the business plan and economic effects on the rural propane usage and address short, medium, long-term volumes and impacts at various throughput volumes.	\$100,000
<b>Project Management Plan</b>		<b>\$900</b>
Evaluate improvements to key infrastructure requirements to support AGMS	Identify and estimate order of magnitude costs for infrastructure improvements to support and facilitate the development of AGMS.	\$150,000
Develop a Project Execution Plan	Develop a PEP to expeditiously implement the AGMS and move the AGMS Phase 1 project to an Open Season and RCA application. The PEP will include a project management and controls system to control Phase 1 scope, schedule and budget.	\$150,000
Prepare a Level 1 Project Schedule Identifying Major Milestones	A Level 1 Project Schedule will be developed.	\$100,000
Prepare an Order-of-Magnitude Cost Estimate for the AGMS	An order of magnitude cost estimate will be prepared for the pipelines, LNG plant, GCP and NGL facilities.	\$250,000
Develop a list of long-lead time equipment and materials	Develop a list of long lead time items for the AGMS project.	\$100,000
Identify critical manpower, construction equipment, logistics and technical support requirements	Develop estimates of required man-power, equipment, materials, etc. for the project. This tool would be used to make adjustments as needed to fit available resources. develop estimates of required man-power, equipment, materials, etc. for the project.	\$150,000
<b>Preliminary Economic Analysis (Cost and Tariffs)</b>		<b>\$475</b>
Evaluate Tariff Structure	Develop tariff for pricing gas and NGL for in-state use. Conduct economic analysis based on a cost-of-service type model to quantify the probable cost of gas for Alaskans. Assumptions on demand, capital costs, etc will be based on above work efforts. Operating cost estimates for the pipeline and GCP will need to be developed.	\$150,000
Prepare an Economic Analysis of Cost and Benefits of AGMS	Expand the economic model used in the tariff study above to also include the LNG plant and other aspects of the AGMS project. The benefits model previously developed for ANGDA incorporates a LNG plant and can be modified to incorporate new information. Conduct sensitivity analysis related to key risk areas. Economic analysis to address: a) regional gas demand analysis (based on updating previous studies and above work efforts) b) tariff structure for in-Alaska gas usage (cost-of-service assessment) c) market assessment and market forecast for LNG d) summarize the potential financing options e) perform economic model development for third-party LNG plant.	\$150,000
Estimate economic impact of AGMS on employment, state revenues, and other measures	Update ANGDA benefits model to reflect AGMS parameters. Determine the economic benefits of a stable, secure supply of gas for 25 years at a fixed price. The results of this analysis will provide information that can be used by ANGDA to seek additional support for the project.	\$50,000
Provide economic development opportunities for communities	Evaluate AGMS contribution to economic development in communities affected by the project. Look at skills necessary for jobs generated by the project, and the skills available in the community's workforce and define needed training. Coordinate efforts with the Tri-Borough Commission.	\$75,000

## Attachment C Phase I AGMS Task Matrix

	Update ANGDA business plan	After feasibility of the AGMS components has been satisfied and partners identified, update the existing business plan to reflect this new arrangement.	\$50,000
<b>Financing Options (Reserves and Financing)</b>			<b>\$1,100</b>
	Develop general business strategy and option for ownership and financing of the AGMS project	Solicit ideas and input from members of the financing and development community as well as local AGMS Phase 1 participants.	\$100,000
	Development of other Alaska basins	Evaluate options for bringing gas discovered in other basins to market.	\$100,000
	Establish a format on North Slope Gas contract	Work with gas producers to determine their preferred gas sales contract.	\$250,000
	Evaluation of financing risks	As a precursor to obtaining financing, the project team must assess risks to the financiers. Focus on construction schedule and cost, regulatory uncertainty, on-shore and off-shore gas market conditions.	\$200,000
	Summarize debt and equity options for potential third parties	Include results of economic analysis. Identify risk areas and mitigants.	\$125,000
	Solicit interest of project participants in providing equity support	Assess access to equity from operators, material suppliers, constructors. Based on costs of specific elements (LNG plant, gas conditioning facilities, pipelines) of the project, consider factoring investment opportunities into the contracting structure.	\$50,000
	Evaluate ownership structure	Explore access to municipal funds, bonds, capital markets, IPO, with due consideration to the loan guarantee program available under the 2004 Federal enabling legislation. Private and public companies have access to different financing mechanisms. Key to the financing strategy is the creation of the right combination of entities.	\$150,000
	Evaluation of tax-exempt and tax bond financing, large private placement, large public offering	Explore access to municipal funds, bonds, capital markets, IPO. Assess market's acceptance of financing an infrastructure project of this magnitude in Alaska, the impact that Alaska's "nationalistic spirit" may have on financing.	\$50,000
	Determine Applicability of Federal Loan Guarantees	Review the requirements of the 2004 Federal enabling legislation relative to loan guarantees for Alaska gasline projects.	\$25,000
	Evaluate RCA financing mechanisms	Several non-traditional financing mechanisms have been proposed for the spur line but it is unknown if RCA will permit such mechanisms. Perform an analysis that compares these non-traditional mechanisms with more traditional financing. Coordinate efforts with key stakeholders.	\$50,000
<b>Regulatory, Permitting, Legal and Stakeholder Requirements</b>			<b>\$1,585</b>
	Alaska Regulatory Process: Strategy	Develop a Strategy Plan and Program as a road map to advance the Project with the Regulatory Commission of Alaska (RCA). Develop and deliver a cohesive vision and a transparent and even-handed decision framework to help utilities, local governments and key stakeholders frame options and evaluate risk. The goal of this effort is to provide decision-makers with consistent information about the AGMS and to promote open dialogue of critical program milestones and decision opportunities.	\$150,000
	Alaska Regulatory Process: Education and Outreach.	Implement specific measures of the regulatory strategy for the Project including: 1. Training and education for utility boards and local governments. Leverage groups such as Alaska Power Association to conduct training on Open Season process, mock bidding session. 2. Develop and implement a decision framework suitable for evaluating risk and opportunities associated with AGMS and other energy alternatives. 3. Incorporate other key issues related to energy policy in Alaska such as climate change and energy independence into the AGMS decision process. 4. Create and administer a public version of the project schedule and organization chart.	\$200,000
	Federal Regulatory Strategy	Develop a Strategy Plan and Program as a road map to advance the Project with the Federal Energy Regulatory Commission (FERC) process governing export of LNG.	\$150,000
	Project Permitting Strategy	Develop a Strategy Plan and Program as a road map for the permitting process for the entire project. Numerous environmental and land use authorizations are needed to construct and operate the Project. A strategy to guide the permitting process is necessary to advance the Project in preparation of submitting permit applications to federal and state regulatory agencies. The Strategy will build upon previous work by ANGDA to identify permitting requirements.	\$250,000
	Gas Treatment Plant Permitting	Develop and implement specific actions to move forward with pre-permitting activities for the Gas Treatment Plant component of AGMS. Review of the authorizations completed or in progress for the ANGTS GTP.	\$10,000
	Critical Data Gaps in Project Permitting	Identify the critical gaps in the body of data that is necessary for preparing and supporting the environmental and land use permits for the Project including the state and federal ROW grants.	\$200,000
	Pre-Permitting Work Group	Initiate the permitting process for the AGMS Project by assembling the AGMS Permitting Work Group. The Work Group will consist of staff from resource agencies, AGMS representatives, and other stakeholders. The Work Group will meet regularly to consider environmental, land use, subsistence and socioeconomic protection issues related to permitting the Project. The Work Group will provide valuable early feedback from resource agencies and other stakeholders that will help to advance the Project.	\$100,000

## Attachment C Phase I AGMS Task Matrix

	<b>Public Education and Outreach Program</b>	Develop and initiate a public education and outreach program for AGMS and utility/coop member decision process. Coordinate information flow in both directions. Create and implement a branding and education campaign for AGMS. Have a transparent and consistent message for the project. 2. Conduct public forums/discussions with Alaska Native communities to include their concerns about the Project, with special attention on subsistence activities and resources.	<b>\$250,000</b>
	<b>AGMS NEPA Compliance / EIS Strategy</b>	Develop a road map to achieve NEPA compliance for the Project, including the potential for a third-party EIS or supplemental EIS to cover all components. Consider the opportunity for utilizing the TAGS/YPC NEPA authorizations for the pipeline component.	<b>\$100,000</b>
	<b>AGMS Acquisition of TAGS/YPC Permits and Authorizations</b>	Determine if the existing permits and authorizations held by YPC are usable for the AGMS project concept. Identify the process and conditions under which these could be acquired by AGMS.	<b>\$50,000</b>
	<b>AGMS Use of TAPS Right-of-Way</b>	Determine the opportunities for utilizing portions of the TAPS ROW for the AGMS pipeline, compressor stations, or other facilities. Review the Project technical data and conduct discussions with regulatory agencies (JPO) and TAPS Operators (Alaska Pipeline Service Company). Identify options for sharing costs with TAPS.	<b>\$50,000</b>
	<b>ROW Grant and Permit Conditions Matrix</b>	Compile and correlate the requirements of the conditional ROW Grants and permits issued for the ANQDA Spur Line and the TAGS/YPC project to date. Initiate development of the plans and programs to satisfy the ROW conditions and other permit stipulations.	<b>\$75,000</b>
<b>Key Issues, Risks, Uncertainties and Opportunities</b>			<b>\$1,300</b>
	<b>Evaluate a Fast Track Permitting Strategy</b>	With the current support to bring North Slope gas to market, consider developing an early permitting and licensing program in concert with key Alaska agencies. Conduct high-level coordination with federal and state agencies to consider options to reduce permitting timelines, building upon the existing Joint Pipeline Office structure.	<b>\$150,000</b>
	<b>Implement a Comprehensive Public Outreach and Stakeholder Relations Program</b>	Design a public outreach and stakeholder relations program to ensure that AGMS is understood by all stakeholders. Provide a forum for comments and input to the Phase 1 project as it moves forward.	<b>\$250,000</b>
	<b>Quantify Risks and Rewards</b>	Identify and quantify major risks, uncertainties, mitigating measures, opportunities, and rewards for the AGMS.	<b>\$100,000</b>
	<b>New Technology and Innovations</b>	Evaluate technology developments that could materially impact the cost and schedule of the AGMS project.	<b>\$100,000</b>
	<b>Identify and Option Critical Logistical Sites</b>	Review utilization and suitability of selected sites for work camps, site preparation, long-lead orders for pros, supplies, prepositioning of material, management plan and assignment of responsibilities. Take options on existing critical sites and prepare applications for new sites.	<b>\$500,000</b>
	<b>Open Season Preparation</b>	Develop and provide educational/informational workshops for utility participation in open season. Provide workshops on Offtake Points, Cost Drivers, FERC Open Season Rules, FERC/RCA approval timeframes, Potential for State Royalty gas, Open Season Bid Components, Gas Supply Chain, Financial Commitment Requirements. Conduct Practice Open Season.	<b>\$200,000</b>
<b>GRAND TOTAL FOR ALL WORK GROUPS</b>			<b>\$ 10,440</b>

**Alaska Gas**  
**Market System**  
**(AGMS)**



**ANGDA** — *"Connecting Alaskans To Their Natural Gas"*

**Alaska Natural Gas**  
**Development Authority**

**[www.angda.state.ak.us](http://www.angda.state.ak.us)**  
**[www.jpo.doi.gov/ANGDA/ANGDA.htm](http://www.jpo.doi.gov/ANGDA/ANGDA.htm)**  
**[www.allalaskaing.com](http://www.allalaskaing.com)**

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## Elements of AGMS

- Gas pipeline is high pressure and buried
- Prudhoe Bay to Glennallen is 24-inch with 20-inch to Valdez & 16-inch to Cook Inlet
- LNG plant produces 7 mmtpa (1 BSCFPD) from 2 trains
- Gas conditioning on North Slope removes CO<sub>2</sub> (EOR use) & blends NGL's (ethane / propane)
- Cook Inlet terminus in Beluga Gas Field for storage (levels seasonal variations)
- Utility gas take-off points and propane wholesale facilities along route

## Throughput & Cost & Tariff

- NS offtake is 1.25 BCFPD with 0.25 BCFPD to Cook Inlet & 1.0 BCFPD to Valdez LNG
- Pipelines are \$4 B, NS gas conditioning is \$1 B, and Valdez LNG plant is \$3 B (benchmark estimates)
- Expect tariff to Cook Inlet to be less than \$2 per mmbtu (Chicago is \$2.50)
- Tariff to Valdez less than \$1.50 per mmbtu and total cost to LNG destination less than \$4 per mmbtu

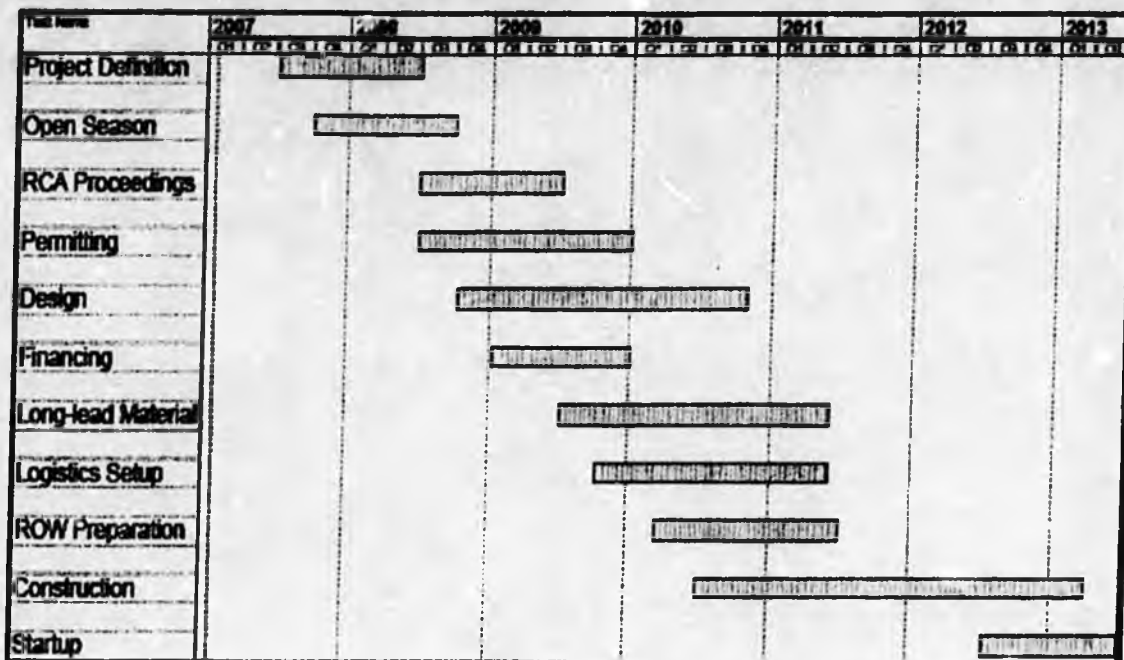
## Markets

- **Cook Inlet and Interior utilities (gas & electric)**
- **Propane for use in coastal, river, and highway communities**
- **Valdez LNG for shipment to US & other Pacific Rim regas facilities**
- **Cook Inlet industrial and petrochemical plants**

## Project Timeline

- **Six years to first gas delivery**
- **Three year construction period**
- **LNG facility will be constructed as a separate project**
- **Gas delivery can be started before gas conditioning & LNG facilities available**
- **North Slope gas conditioning may be a Prudhoe Bay Unit or pipeline facility**

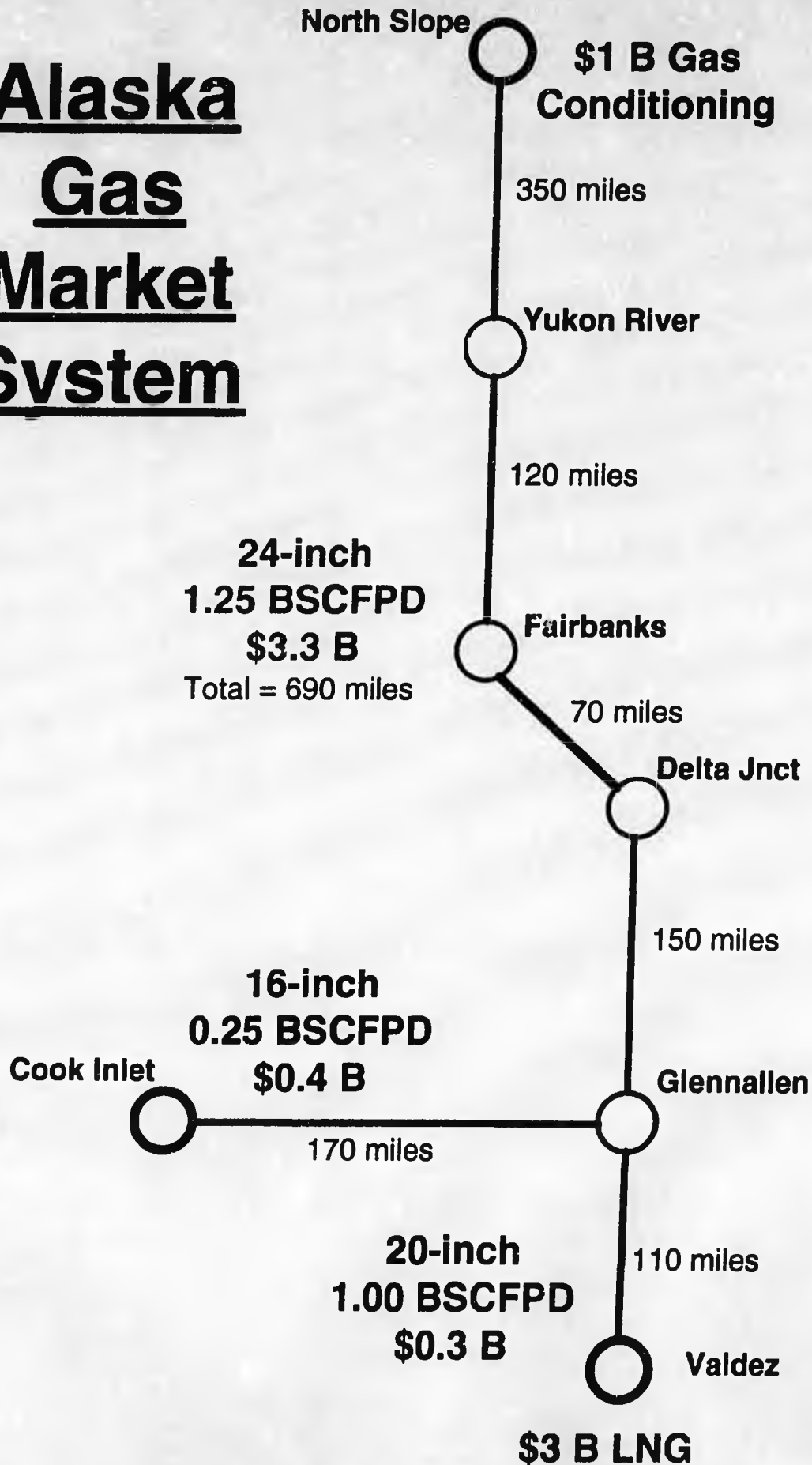
# Tasks & Timeline



## Joint-Work Process

- Covers the definition phase
- Voluntary and Non-exclusive
- Participant contribute in-kind expertise
- At least two major work effort teams (pipelines & LNG)
- Full time team leaders
- Steering committee open to all participants (summary info is public)

# Alaska Gas Market System



## **Reserves & Financing**

- **Financing basis would be 10 TCF of committed reserves**
  - State 3 TCF plus one-producer 7 TCF
  - State 3 TCF plus all Point Thomson at 8 TCF
  - State 3 TCF plus new discoveries of 3 TCF
- **LNG plant would be built and owned by LNG companies with existing tanker fleet and delivery sites**

## **Partners We Can Expect**

- **Oil & gas companies (including “producers”)**
- **Pipeline companies**
- **LNG plant and ship owner / operators**
- **Experienced energy project investors**
- **Local Alaska utilities (gas & electric)**
- **State of Alaska**
- **US Federal Government**

***No speculators or saboteurs***

Mark Nelson

Lraig Haines Haines

(Produce Gashi Project)

Firm Transportation Agreement

What kind of Balance Sheet  
would it take to

David VanHook Tyk

AGT 60 yr - TAX  
Royalty

## Questions

- Start at full life 2030*
- What was the oil flow rate through TAPS in 2003? (Answer-990,000b/d) Today? (Answer-740,000b/d) What do you anticipate it will be in 2017?
  - At what flow rate do you expect TAPS to shut down if there is no gasline? (Answer-300,000b/d) When do you expect TAPS to reach that flow rate?  
*200,000*
  - What is the lead time for the flow of first gas from a gasline following the date on which there is an approved agreement? (Answer-8 to 10 years)
  - How long after an approved agreement will it take to get to an open season? (Answer 2 years)
  - Describe what an open season is and how it works.
  - Describe what a Firm Transportation commitment is and how it works.
  - Describe the relationship between an FT commitment and gasline financing.
  - ★ • (How would a gasline be financed without an FT commitment?) *Don't know?*
  - What upstream fiscal incentives would be necessary for your company to be willing to make an FT commitment on the Alaska gasline project during an open season?
  - Describe the commercial challenges and risks a project the size of the Alaska gasline project poses for your company.
  - Without revealing confidential information, compare the internal rate of return on the Alaska gasline project with the IRR of competing projects around the world. (Answer-90% of international, large scale projects have better IRRs)
  - Describe the fiscal and commercial importance of the state's willingness to take its tax gas and royalty gas in kind.

*yes* { • Would an independent, third party, company which did not hold the leases to the gas be able to make an FT commitment during an open season on the Alaska gasline project?

*yes* { • Would an independent, third party, pipeline company, which did not hold the leases to the gas be able to conduct an open season? Please describe the steps through which such a company would have to go to do that?

200 to 400 mil

• Approximately how much would it cost to go to and conduct an open season for the Alaska gasline project? Would these funds be lost if the holders of the gas leases failed to make FT commitments to ship their gas?

• For what reasons might the holders of the gas leases not make FT commitments to ship their gas on an independent, third party, pipeline?

• What type of balance sheet strength would it take to make an FT commitment on the Alaska gasline project? I.e.; how many billions of dollars are put at risk for how long?

• Compare the Producers incentives to keep gasline construction cost overruns down with the incentives an independent, third party, pipeline company might have.

• Are you familiar with Spencer Hosie's duty to develop theory? If so, please explain it.

• If a third party, independent pipeline company spent the funds necessary to go to an open season and the holders of the gas leases failed to make an FT commitment to ship their gas on that pipeline would they breach their implied duty to develop/market their gas?

• What is required of a party to be able to use the federal loan guarantees?

- do they need to first get a FERC certificate?

- do they need to provide a completion guarantee to get a FERC certificate?

- describe the balance sheet a company would have to have to provide a completion guarantee on this project.