

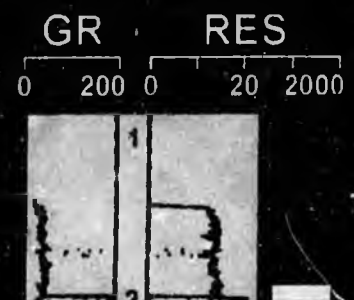
ALASKA LEGISLATURE COMMITTEES 2007-2008 HRLS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 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Burger Prospect

W



Nanushuk Fm.
36 ft gas pay



E

US Resource Estimates (2000)

BURGER CONDITIONAL* DISCOVERED RESOURCES-YEAR 2000

Fill Model	Pool Area (Acres)	Gas Resources (Tcf)			Condensate (Mmb)		
		F95	Mean	F05	F95	Mean	F05
Minimum	52,516	2.389	7.629	17.256	107	393	925
Most Likely	97,545	4.335	14.038	31.384	203	724	1,700
Maximum	189,803	8.496	27.472	63.210	371	1,404	3,370

*No geological risk has been applied to these gas resource estimates. Success factors associated with reservoir presence (0.90) and sufficient (>10%) porosity for productive reservoir formation (0.75) yield an overall geologic chance of success of 0.675 for Burger pool discovered resources. **Risked** mean gas resources for the 2000 assessment would then be: 5.150 tcf (minimum case); 9.476 tcf (most likely case); and 18.544 tcf (maximum case). **Risked** mean NGL liquid resources for 2000 would be: 265 mmbo (minimum case); 489 mmbo (most likely case); and 948 mmbo (maximum case).

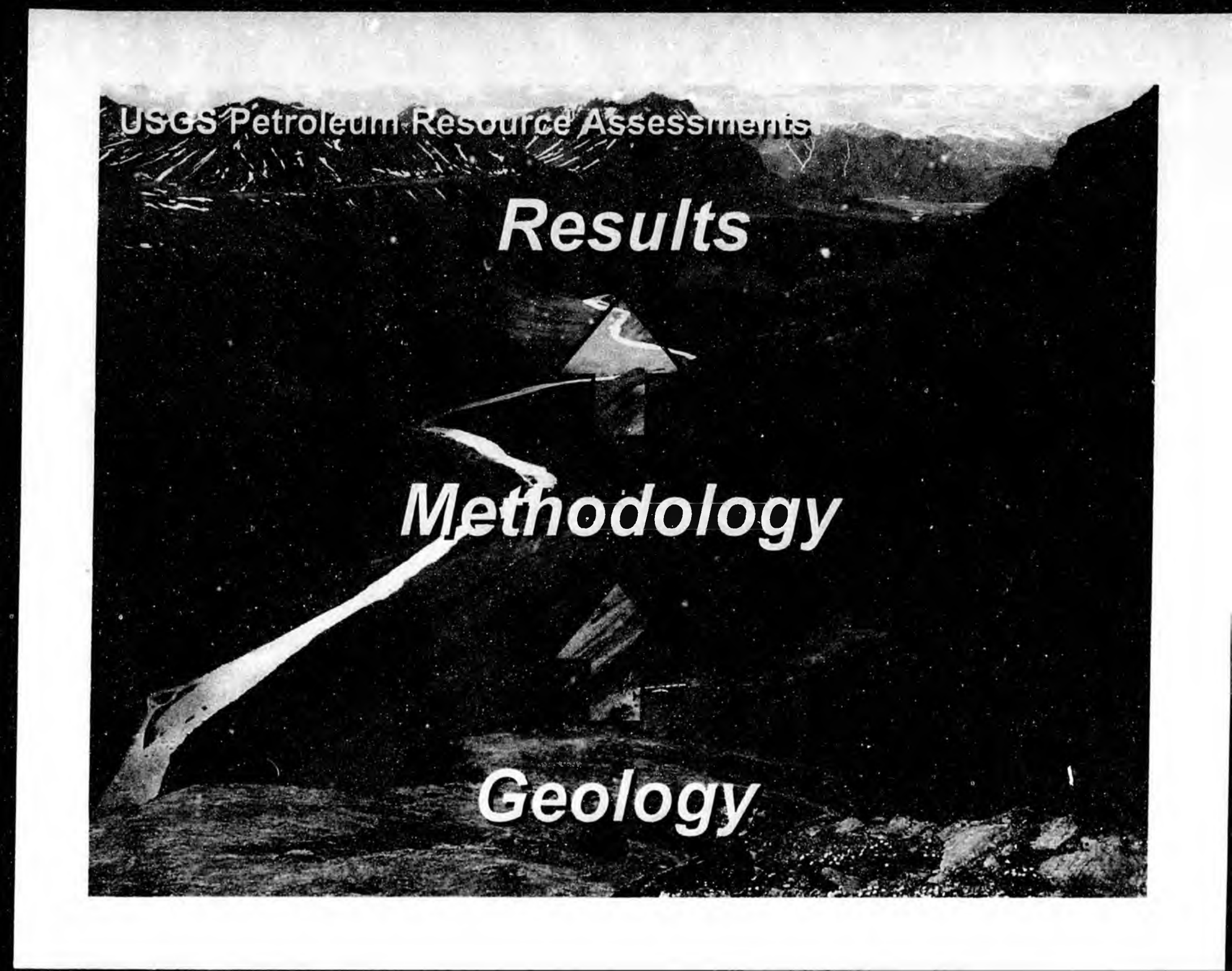
5

20

30

Miles from West End of Line





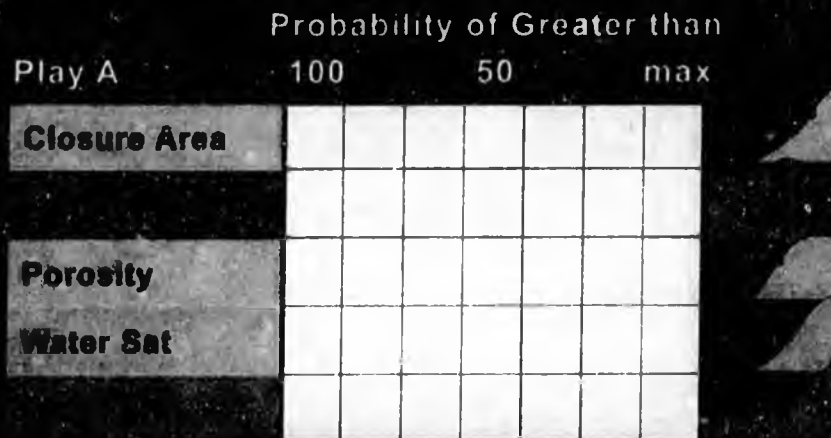
USGS Petroleum Resource Assessments

Results

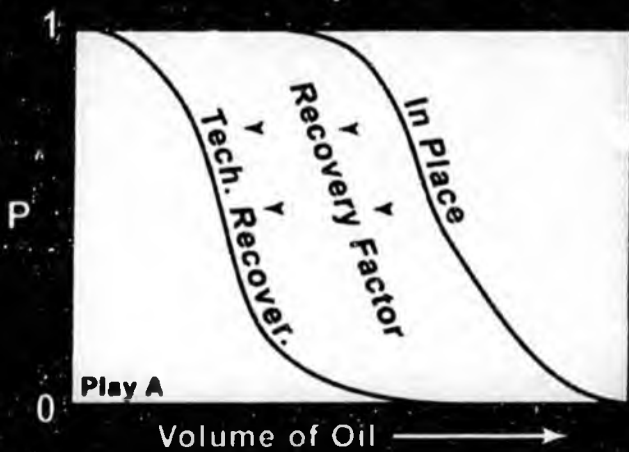
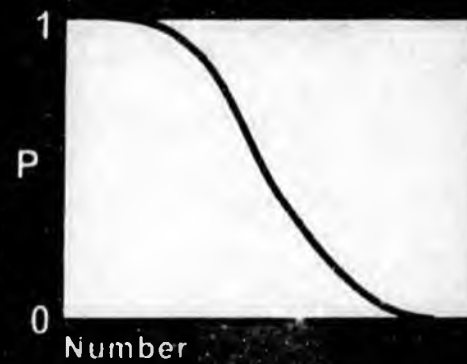
Methodology

Geology

Assessment Methodology – Geologic Basis



Oil vs. Gas



Prospect Risk

Charge	
Reservoir	
Trap	

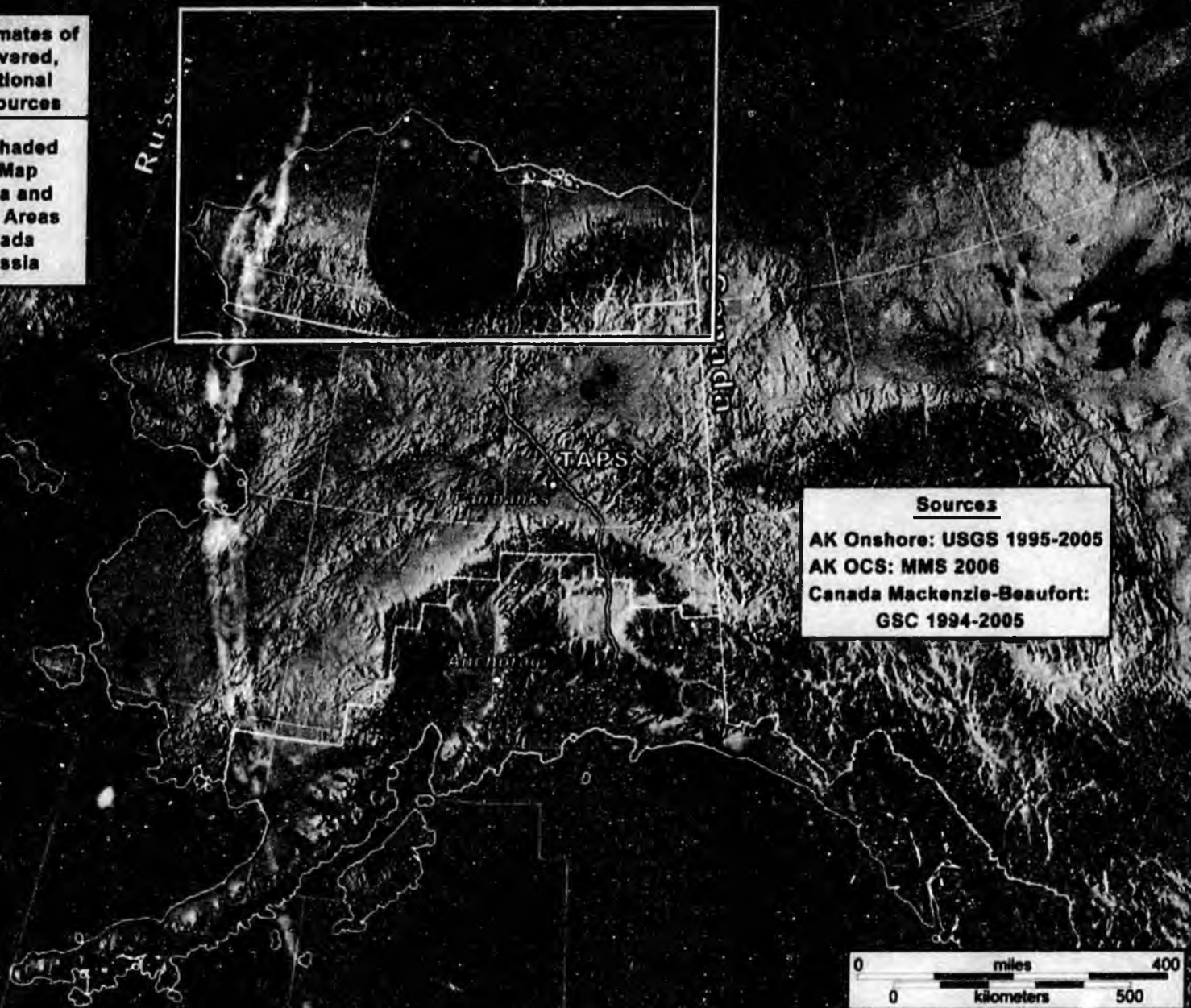
Play Risk

Charge	
Reservoir	
Trap	

Undiscovered Conventional Gas Potential

Mean Estimates of
Undiscovered,
Conventional
Gas Resources

Digital Shaded
Relief Map
of Alaska and
Adjacent Areas
of Canada
and Russia



Potential for Undiscovered Petroleum in Arctic Alaska

Mean Estimates of Undiscovered, Conventional Natural Gas in Arctic Alaska (trillion cubic feet)

	Non-Associated Gas	Associated Gas	Total Gas
Onshore & State Offshore Areas (USGS estimates)			
NPRA	61.35	11.68	73.03
Central North Slope	33.32	4.20	37.52
ANWR, 1002 Area	3.84	4.76	8.60
Subtotal	98.51	20.64	119.15

Federal Offshore Areas (MMS estimates)

Chukchi Shelf	na	na	76.77
Beaufort Shelf	na	na	27.65
Hope Basin	na	na	3.77
Subtotal	na	na	108.19

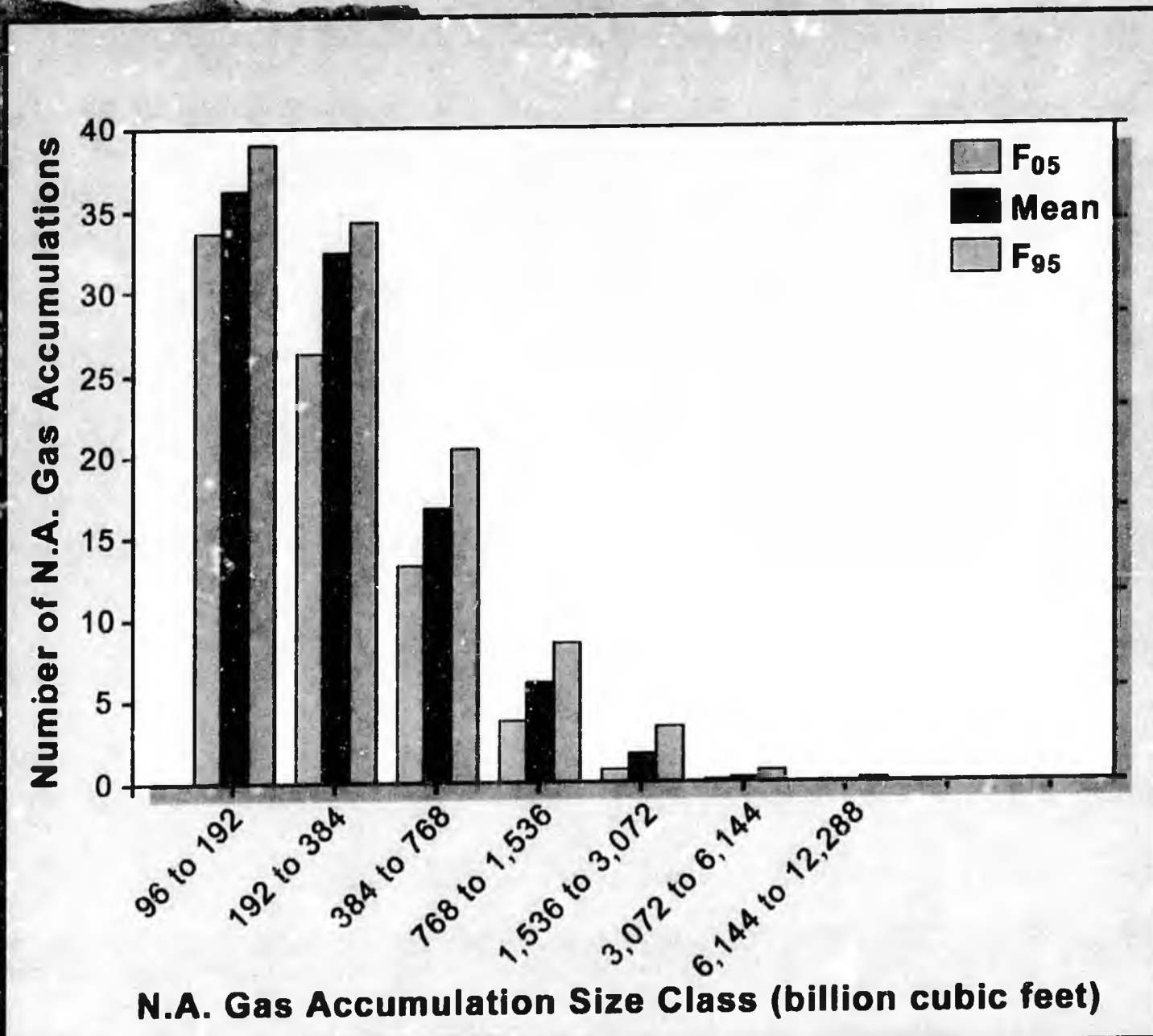
TOTAL **227.34**

Sources: OCS estimates from MMS; onshore & state waters estimates from USGS

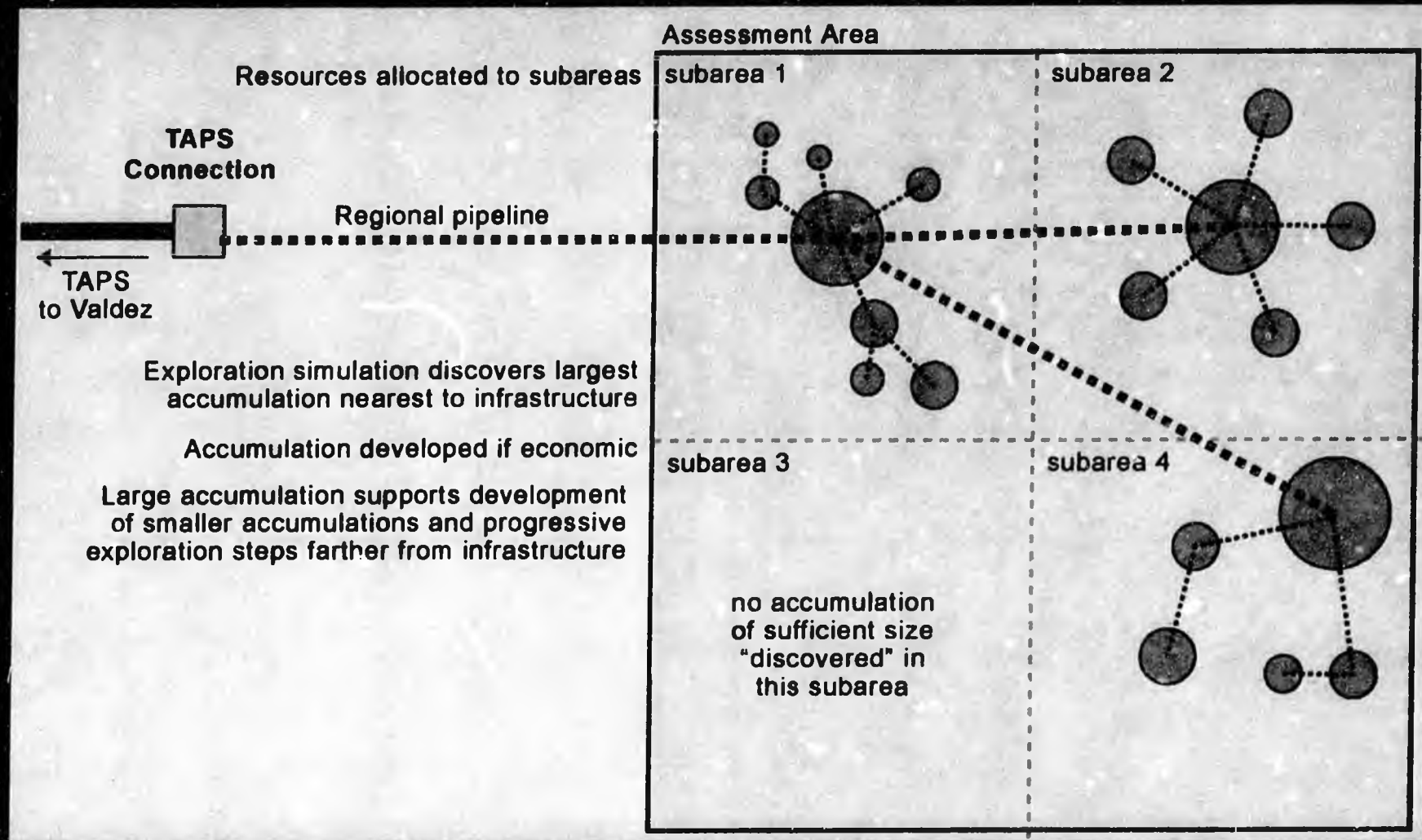


Resour
Meat

Estimates of Gas Accumulation Sizes



Economic Analysis Simulates Exploration and Development



Central North Slope Assessment Area

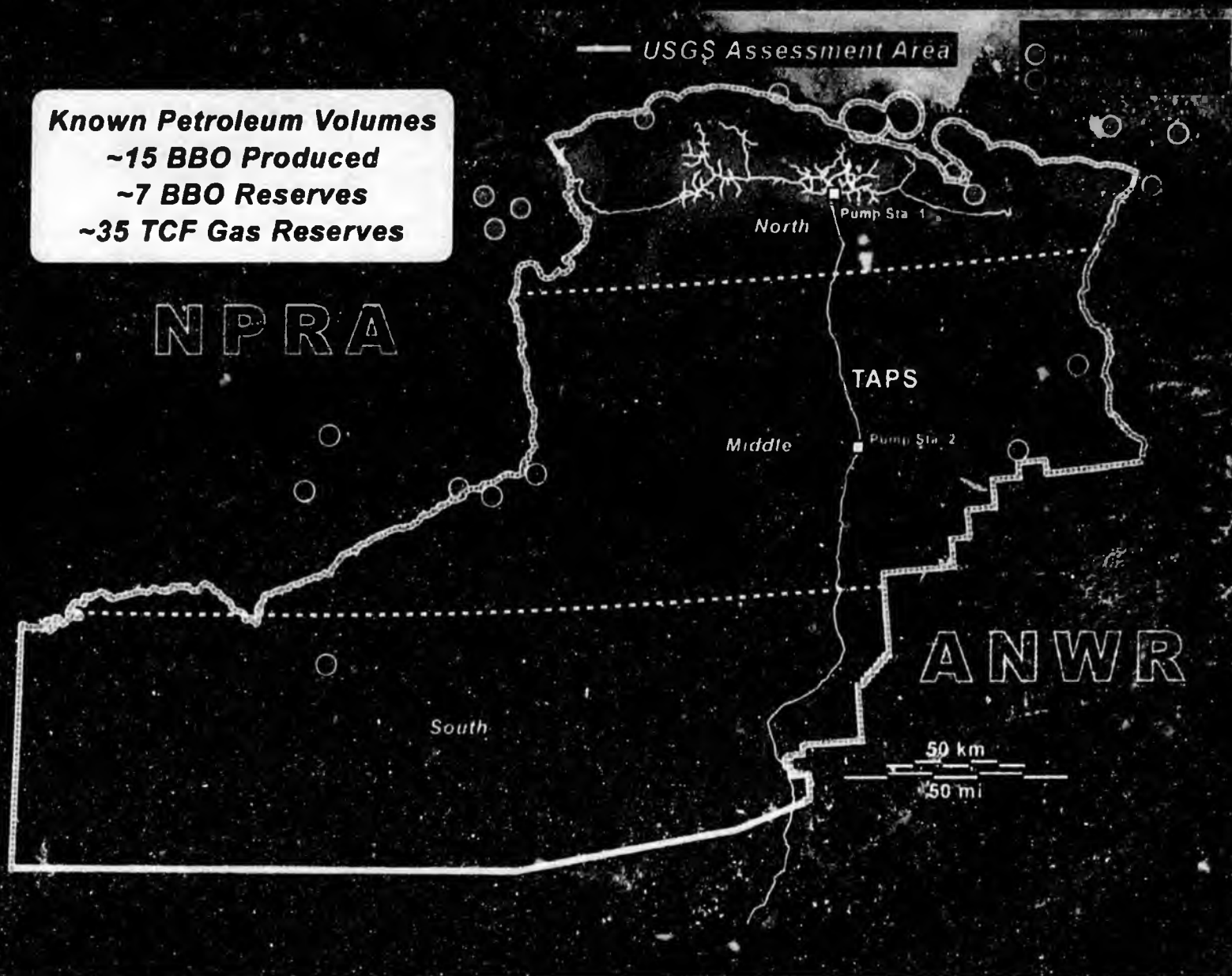
Economic Analysis based on Three Sub-Areas

Known Petroleum Volumes

~15 BBO Produced

~7 BBO Reserves

~35 TCF Gas Reserves



Costs Included in Economic Analysis

- **Exploration**

 - Geology & Geophysics

 - Exploration Drilling (including all preparation & mobilization)

- **Development**

 - Construction of production pads

 - Development wells

 - Construction of processing facilities

- **Production**

 - All operational costs

 - Abandonment costs

- **Transportation**

 - New pipelines from fields to gas-processing plant near PB

 - Pipeline tariff to market in lower-48

- **Taxes**

 - All applicable Federal and State

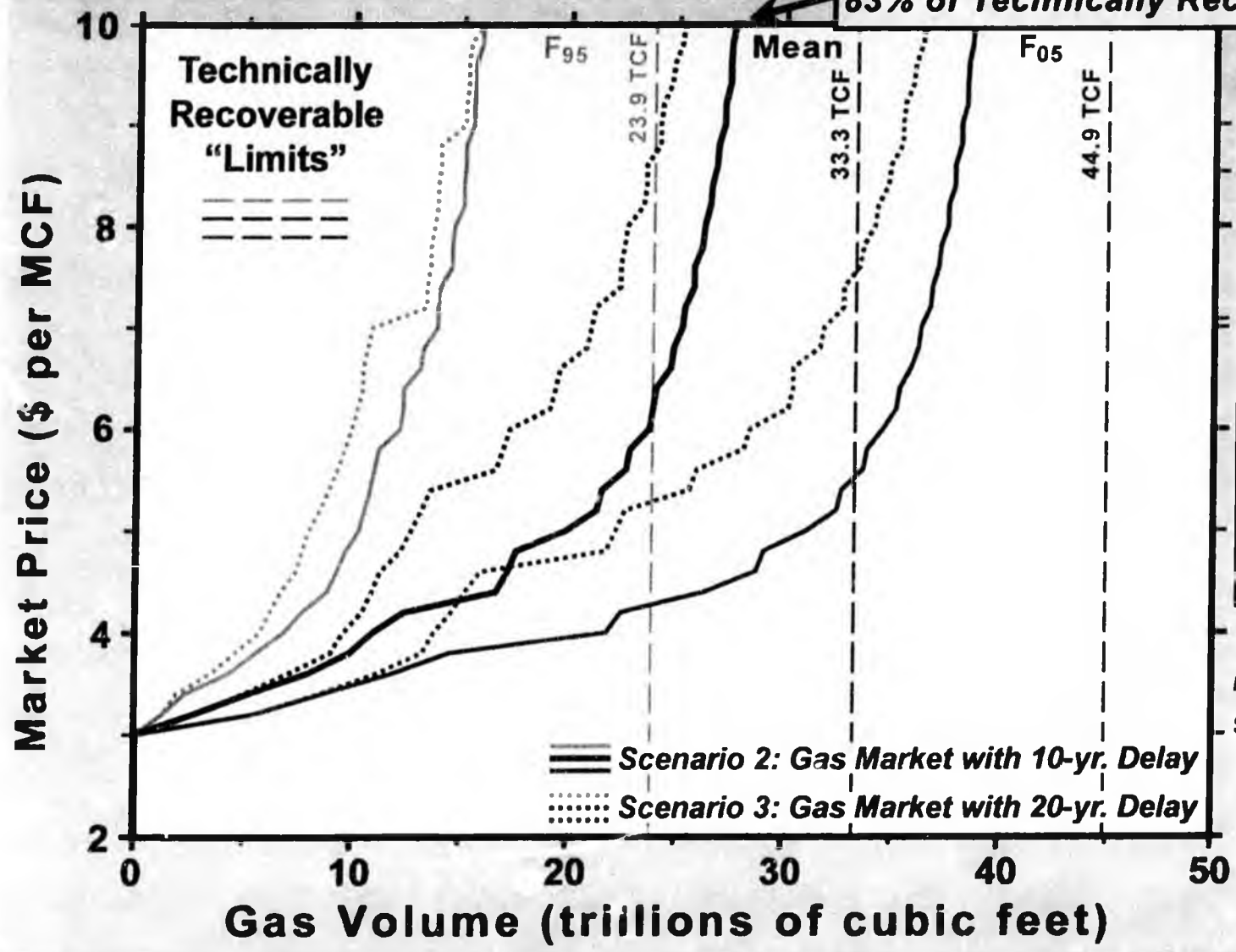
- **Return on Investment**

 - 12% rate of return

Central North Slope Economically Recoverable Gas

Undiscovered, Non-Associated Natural Gas Resources

83% of Technically Recoverable Gas

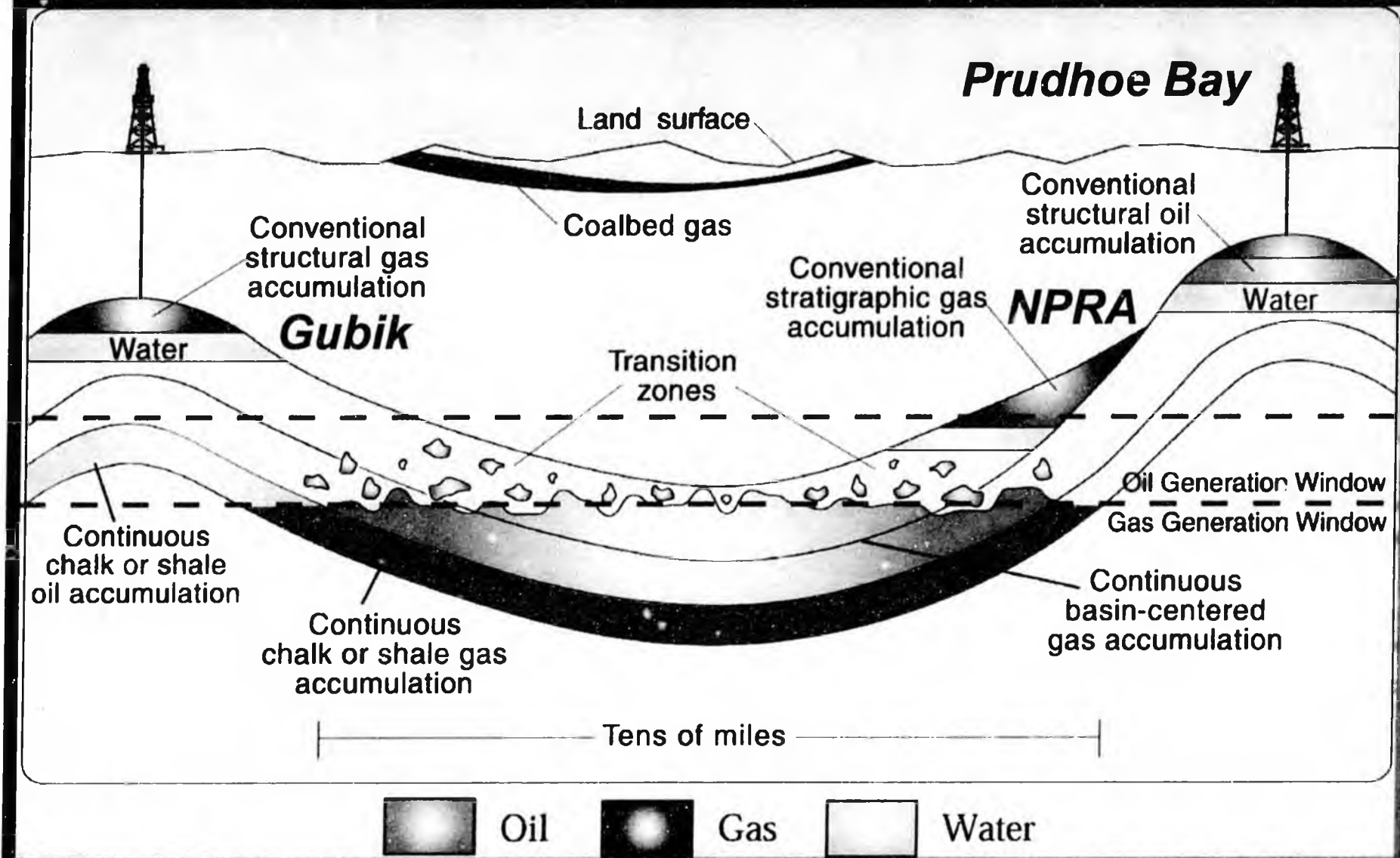


Market Price (\$/MCF)	Economically Recoverable Gas (trillion cubic feet)	
	Sc. 2	Sc. 3
2	0	0
3	0	0
4	10.9	9.6
5	19.9	12.7
6	23.7	17.2
7	25.2	21.0
8	26.2	22.6
9	27.1	24.1
10	27.6	25.2

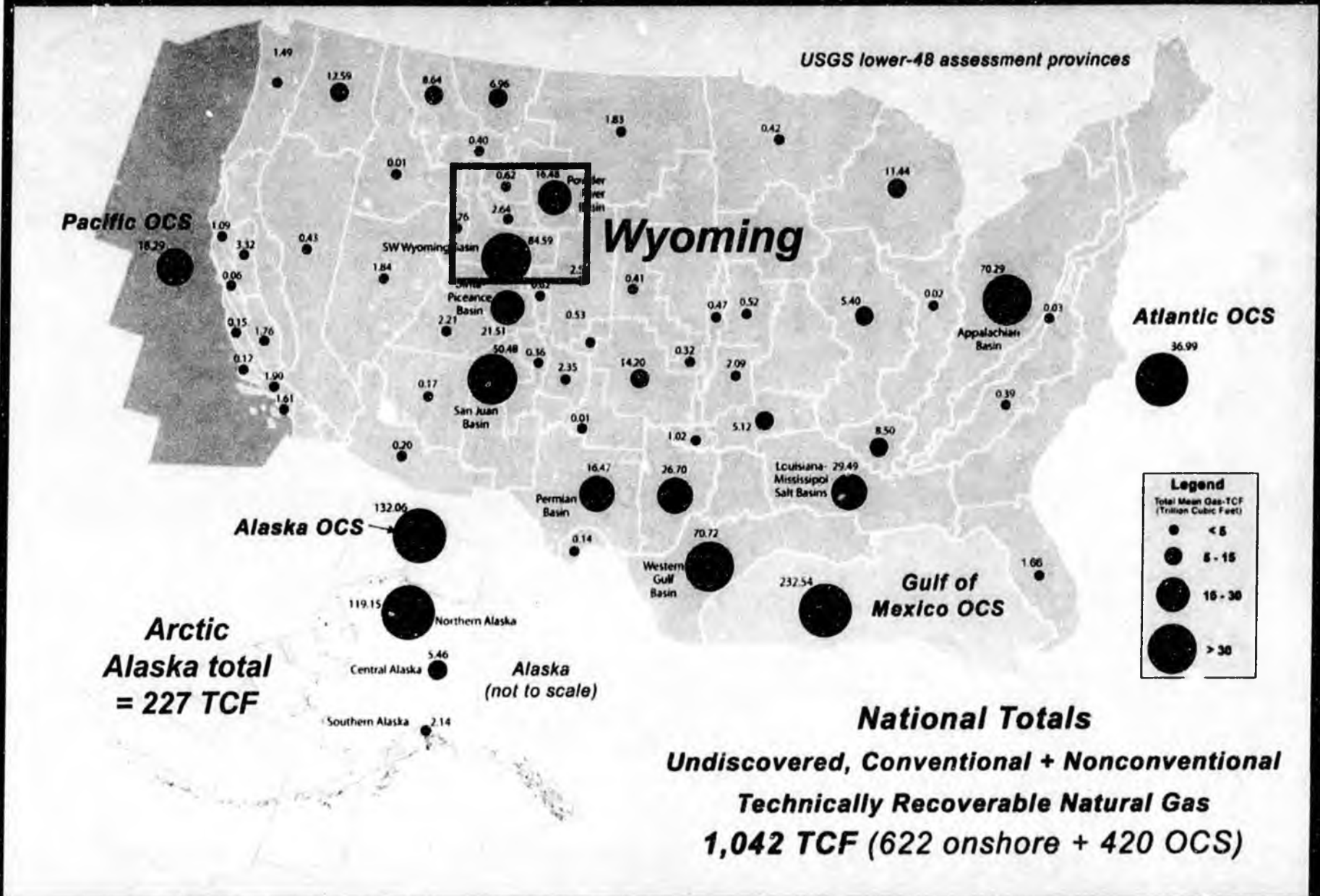
Based on mean estimates of technically recoverable oil resources

Scenario 1 - No Gas Market

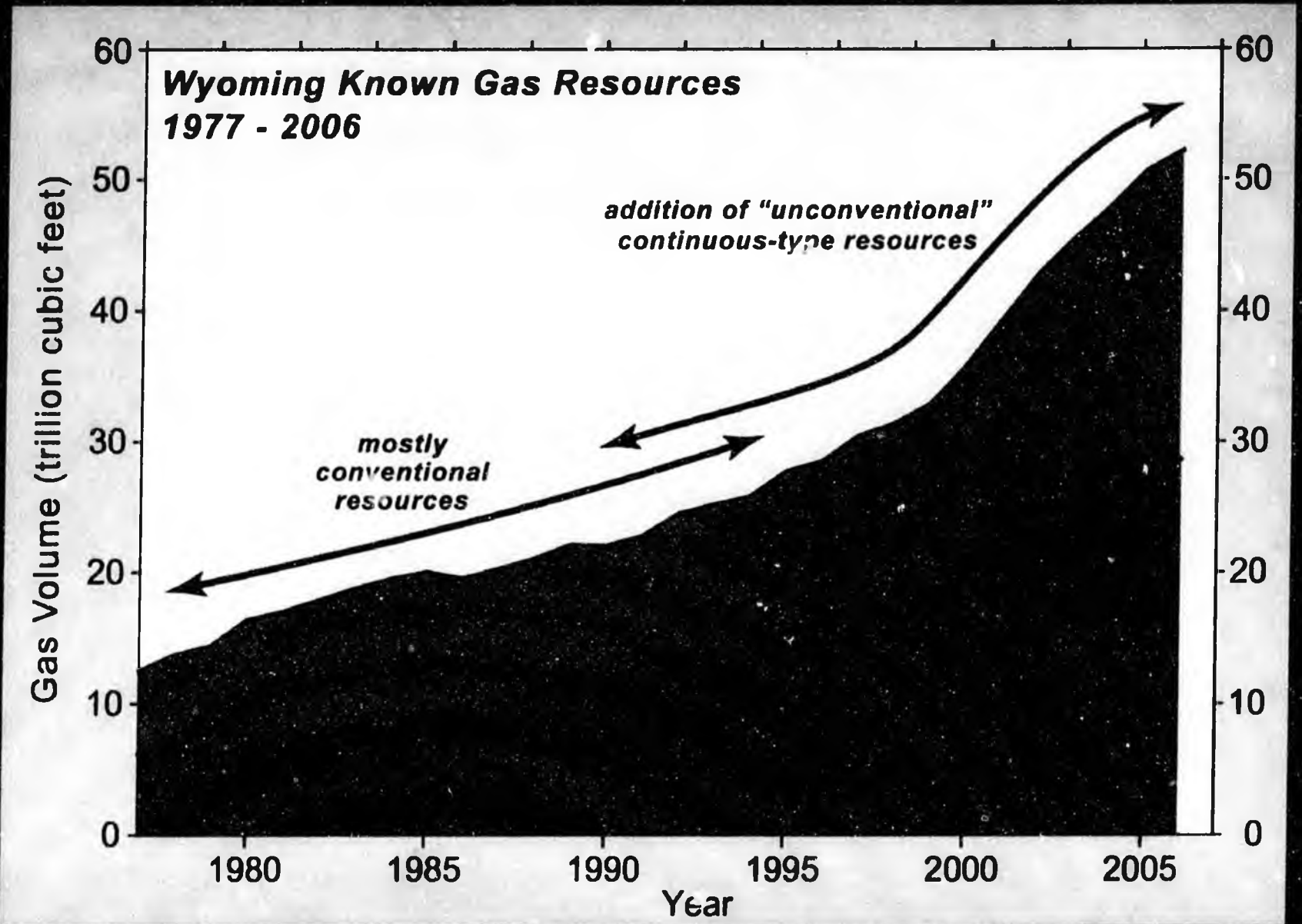
Conventional and "Unconventional" Accumulations



Undiscovered, Total Gas Resources of the U.S.



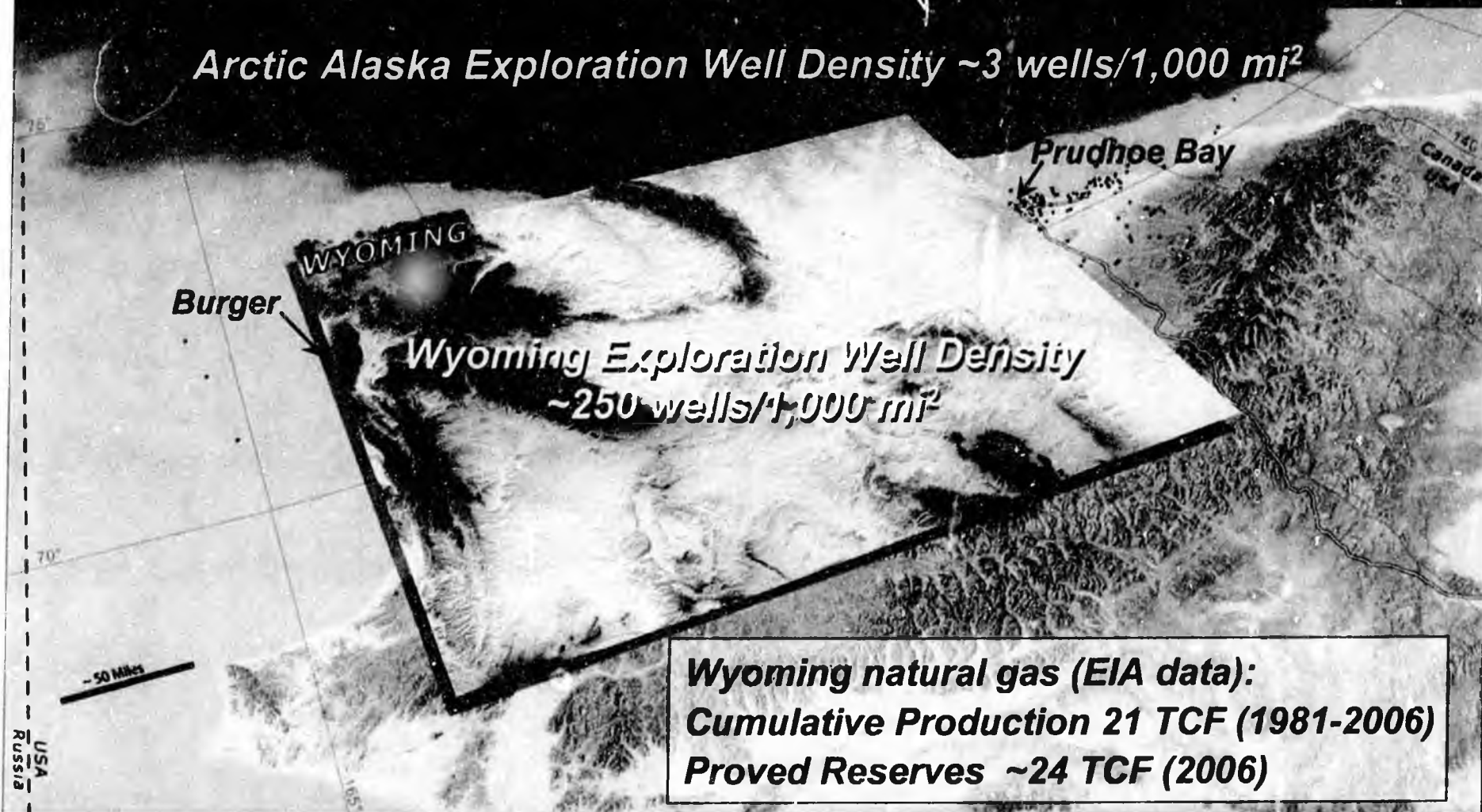
Wyoming Gas Reserves & Production History



Arctic Alaska Exploration Maturity

- Prospective area onshore & offshore shelves ~ 150,000 mi² (~400,000 km²)
- Fewer than 500 exploration wells (red dots)

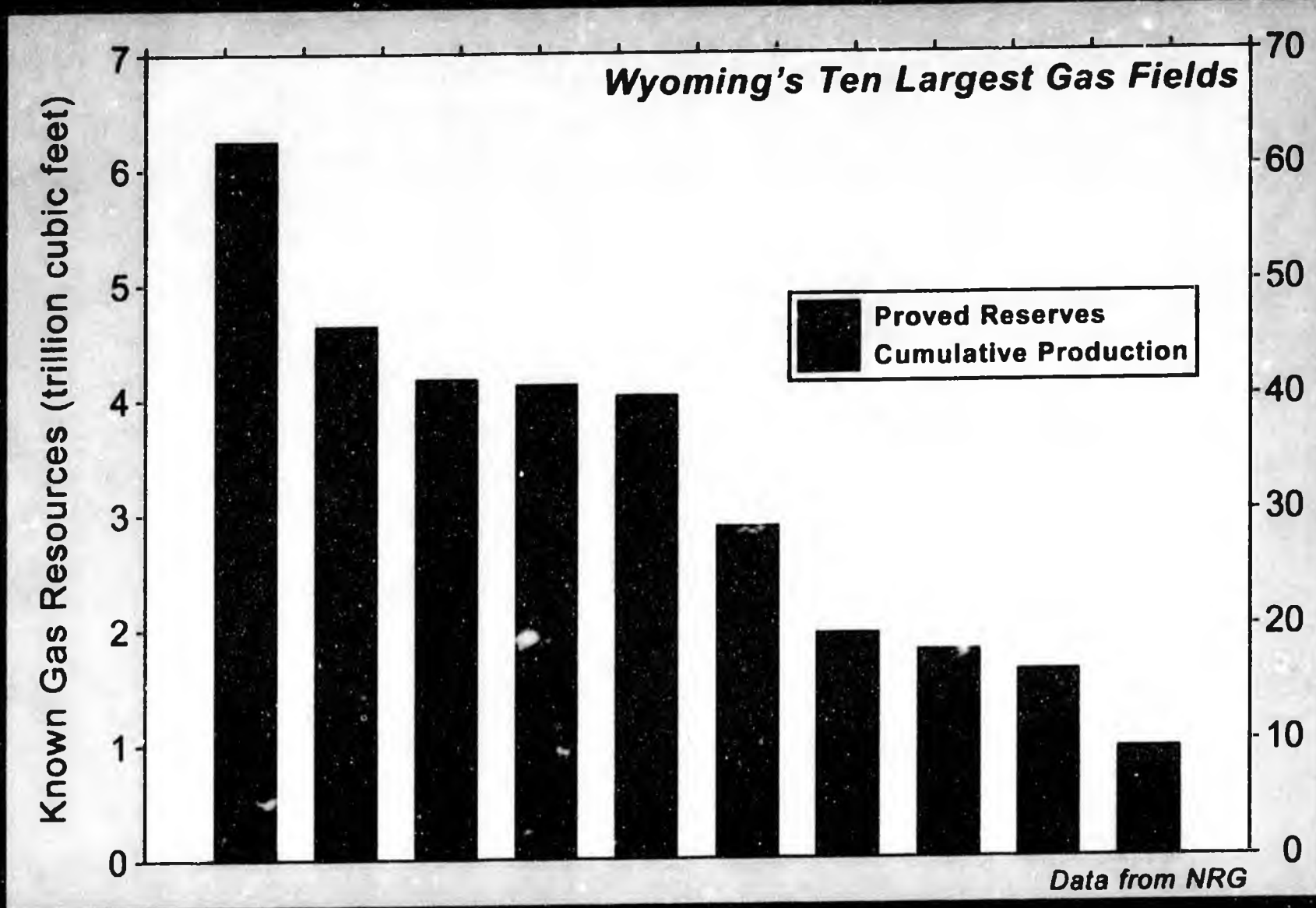
Arctic Alaska Exploration Well Density ~3 wells/1,000 mi²



Wyoming natural gas (EIA data):
Cumulative Production 21 TCF (1981-2006)
Proved Reserves ~24 TCF (2006)

- Entire state of Wyoming ~100,000 mi² (~250,000 km²)
- Petroleum-prospective area ~75,000 mi² (~250,000 km²)
- ~19,371 exploration wells

Wyoming – Ten Largest Gas Fields

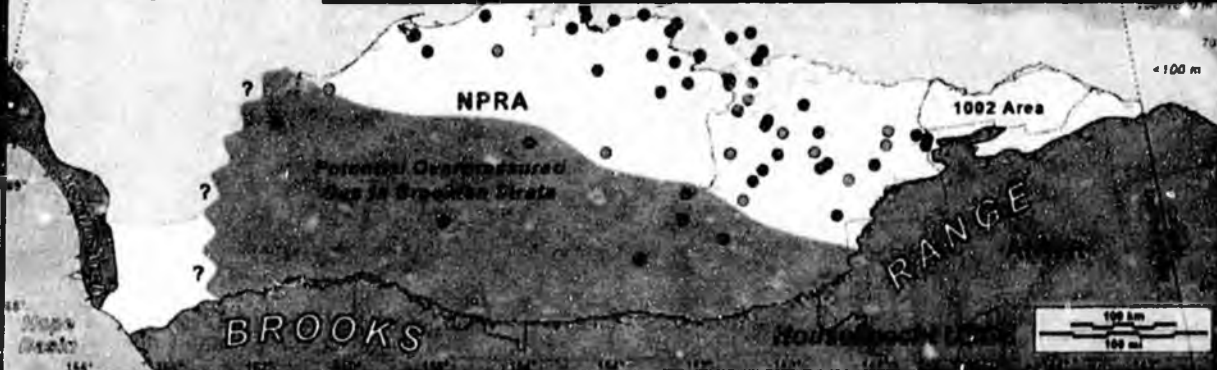


"Unconventional" Gas Resources (continuous resources)

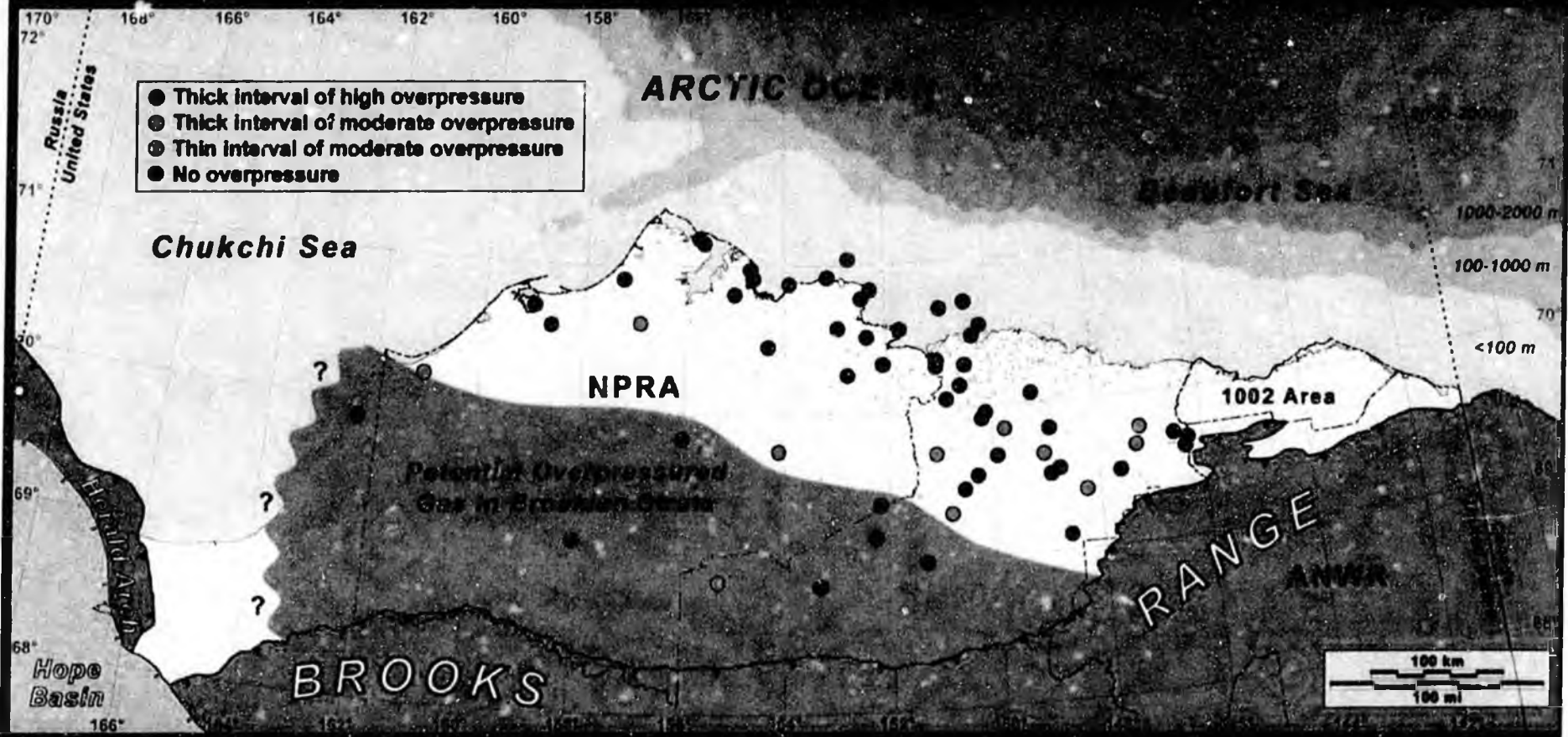
Coalbed Gas

Overpressured, Basin-centered Gas

Gas Hydrates



Overpressured Natural Gas in the Colville Basin
Brookian strata (Torok & Fortress Mountain Formations)
Potential reservoirs mostly low-permeability sandstone
Shale reservoirs possible



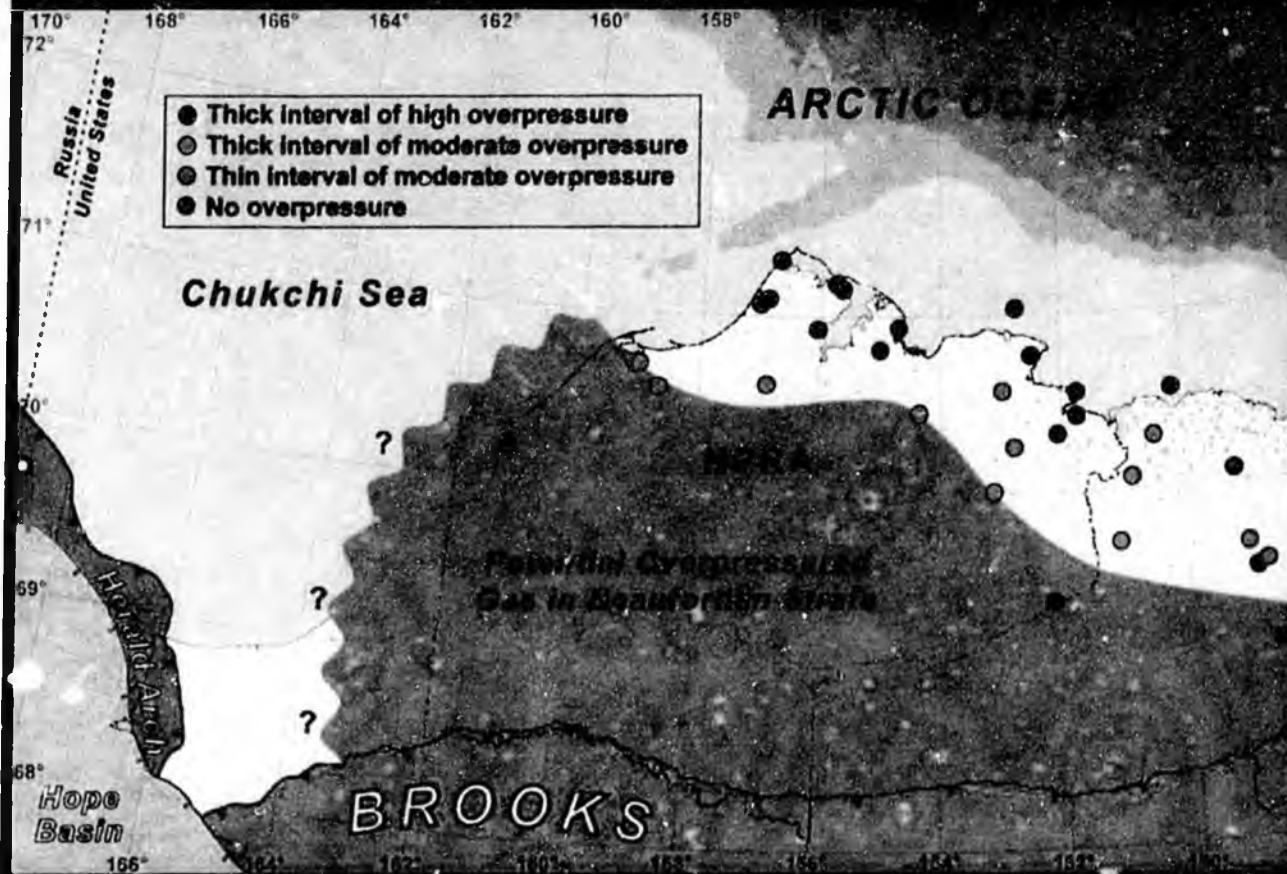
Is this a "low-permeability basin-centered gas accumulation" ?

Overpressured Natural Gas in the Colville Basin

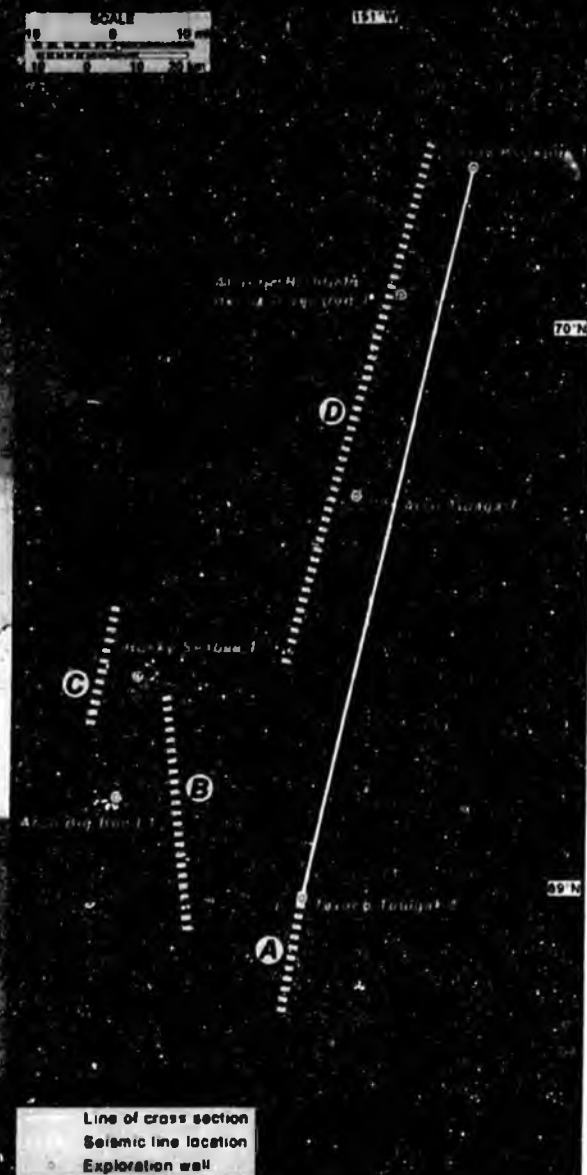
Beaufortian Strata (Kingak Shale)

Potential reservoirs mostly shale

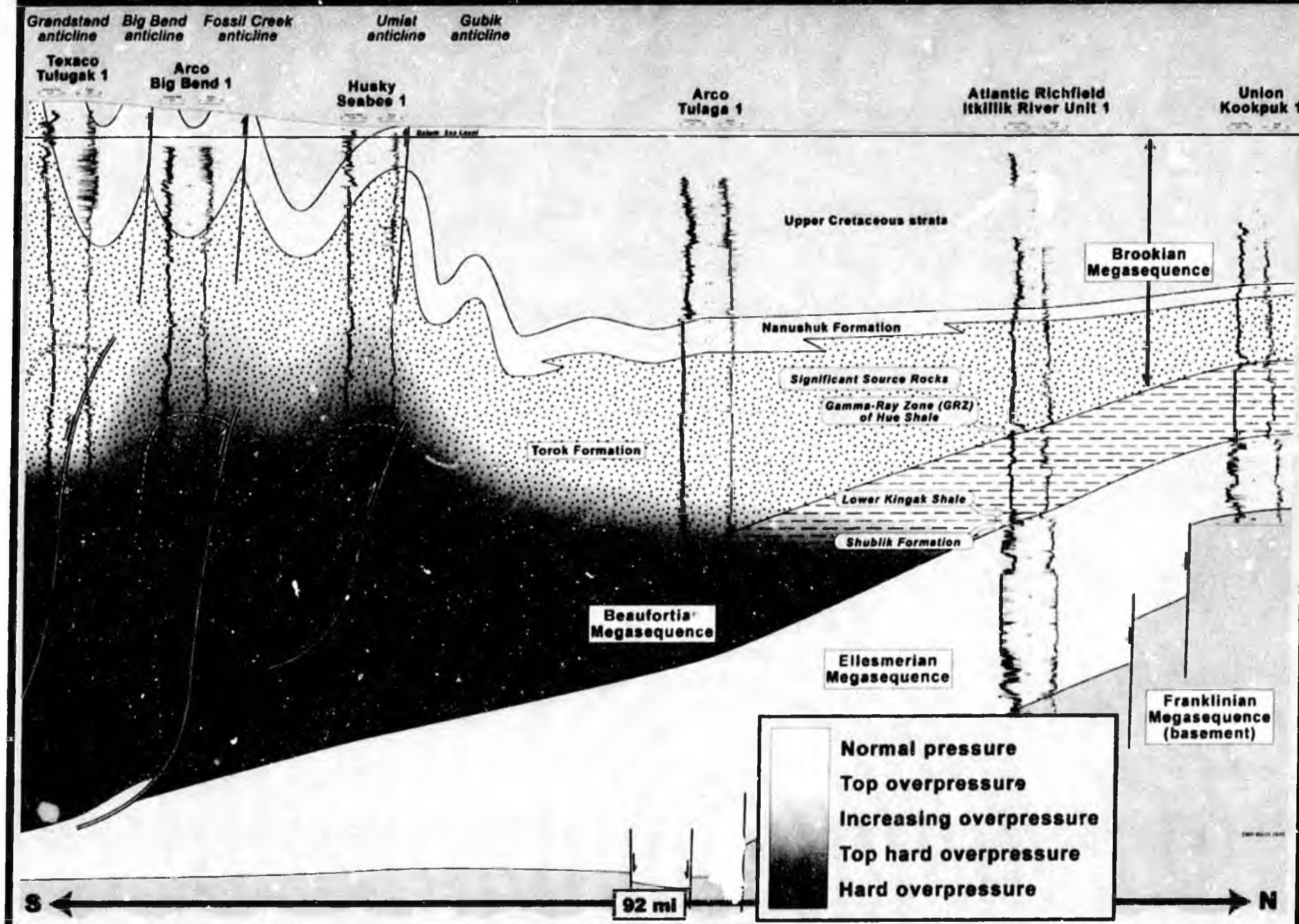
Low-perm sandstone reservoirs possible



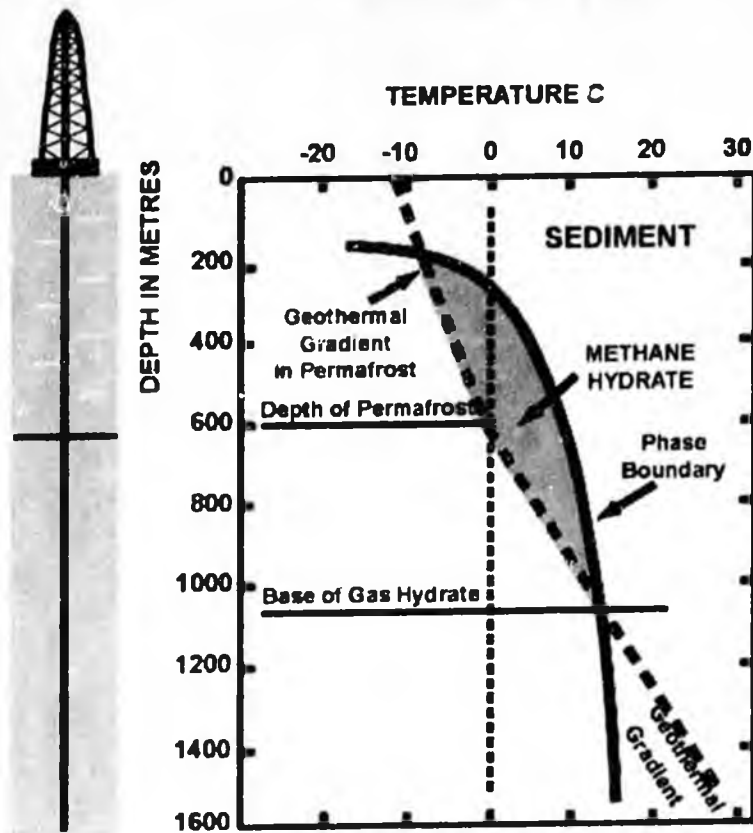
Is this a "low-permeability basin-centered gas



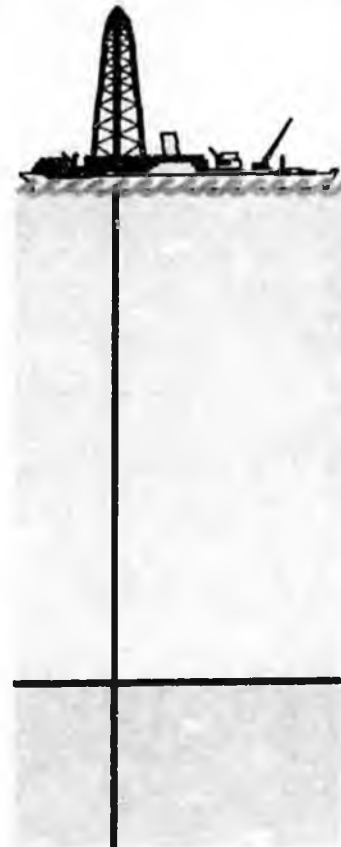
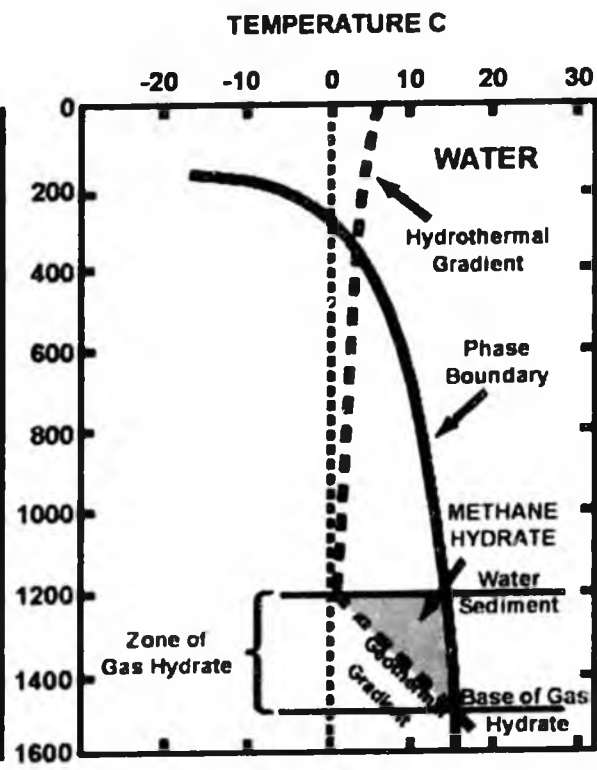
Overpressured Natural Gas in the Colville Basin



PERMAFROST



MARINE



North Slope, AK



BP Exploration Alaska
Arctic Slope Regional Corporation
Ryder Scott Company
RPS - APA Energy
Interpretation Services, Inc.
Doyon Drilling, Inc.
ReedHycalog (Corion)
Drill Cool Systems, Inc.
Omni Laboratories
Schlumberger
MI Swaco

Mallik

98/02/07/08



99/00 MITI

05 Toai-oki
Kumano-nada



ODP 204
IODP 311



ODP 164

UBGH X01

GMGS X01

Gulf of Mexico JIP

ChevronTexaco



Georgia Tech
Rice Univ
Scripps Inst. Ocean
Woods Hole Oc Inst

India



Binghamton University
Colorado School of Mines
Fugro-McClelland, Inc.
GAIL Ltd
Geological Survey of Canada
Geotek Ltd
Idaho National Laboratory
Integrated Ocean Drilling Program
JOI, Inc.
Lamont-Doherty Earth Obs
Ministry of Petrol and Natural Gas
McGill University
DOE-NETL

Natl Inst of Oceanography
Natl Inst of Ocean Tech
Ocean Drilling Limited
Oregon State University
OIL India Ltd
Pacific Northwest Natl Lab
Reliance Industries Limited
Schlumberger
Technical University of Berlin
Texas A&M University
University of California, SD
University of Cardiff
University of New Hampshire
Universität Bremen
University of Rhode Island
U.S. Department of Energy
U.S. Geological Survey
U.S. NSF
Woods Hole Ocean Inst

International Gas Hydrate Research

GH-Saturated conglomerate –
NW Canada (Mallik)



A

GH-saturated turbidite –
Nankai trough



B

GH-saturated fractured clays –
Bay of Bengal



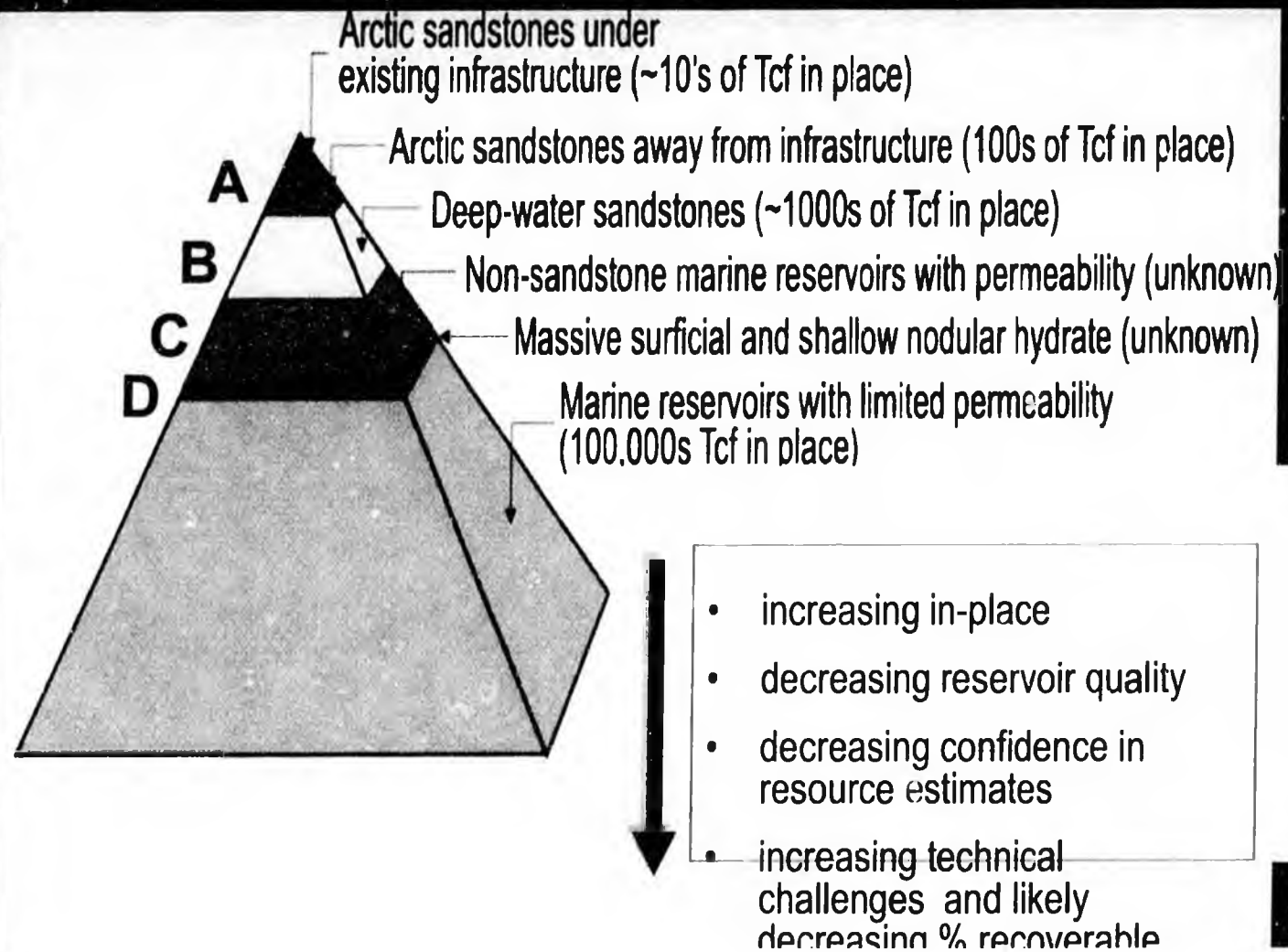
C

Massive GH seafloor mound –
Gulf of Mexico



D

The Gas Hydrate Resource Pyramid



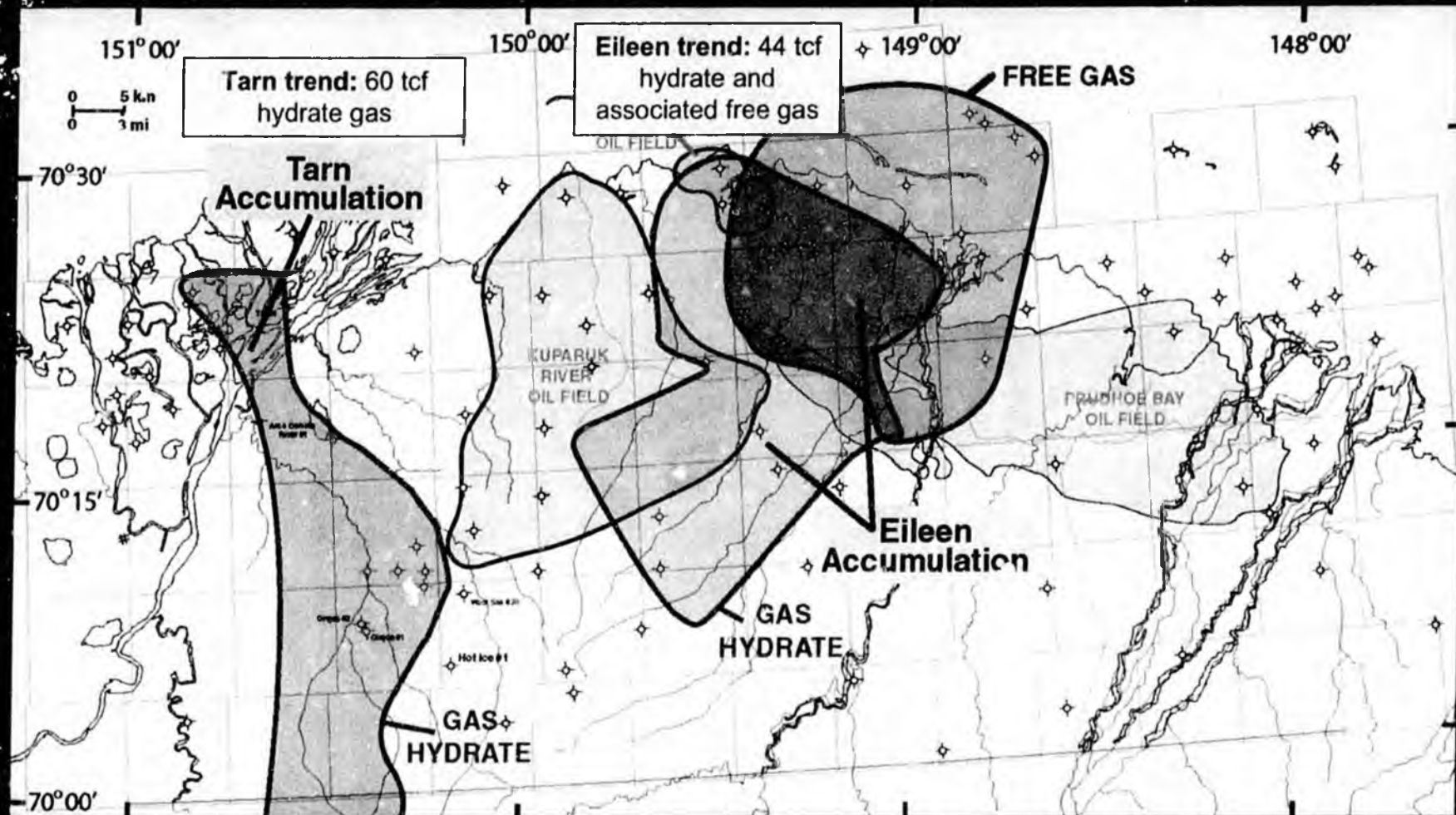
Gas Hydrates

Northern Alaska Zone of Potential Hydrate Stability



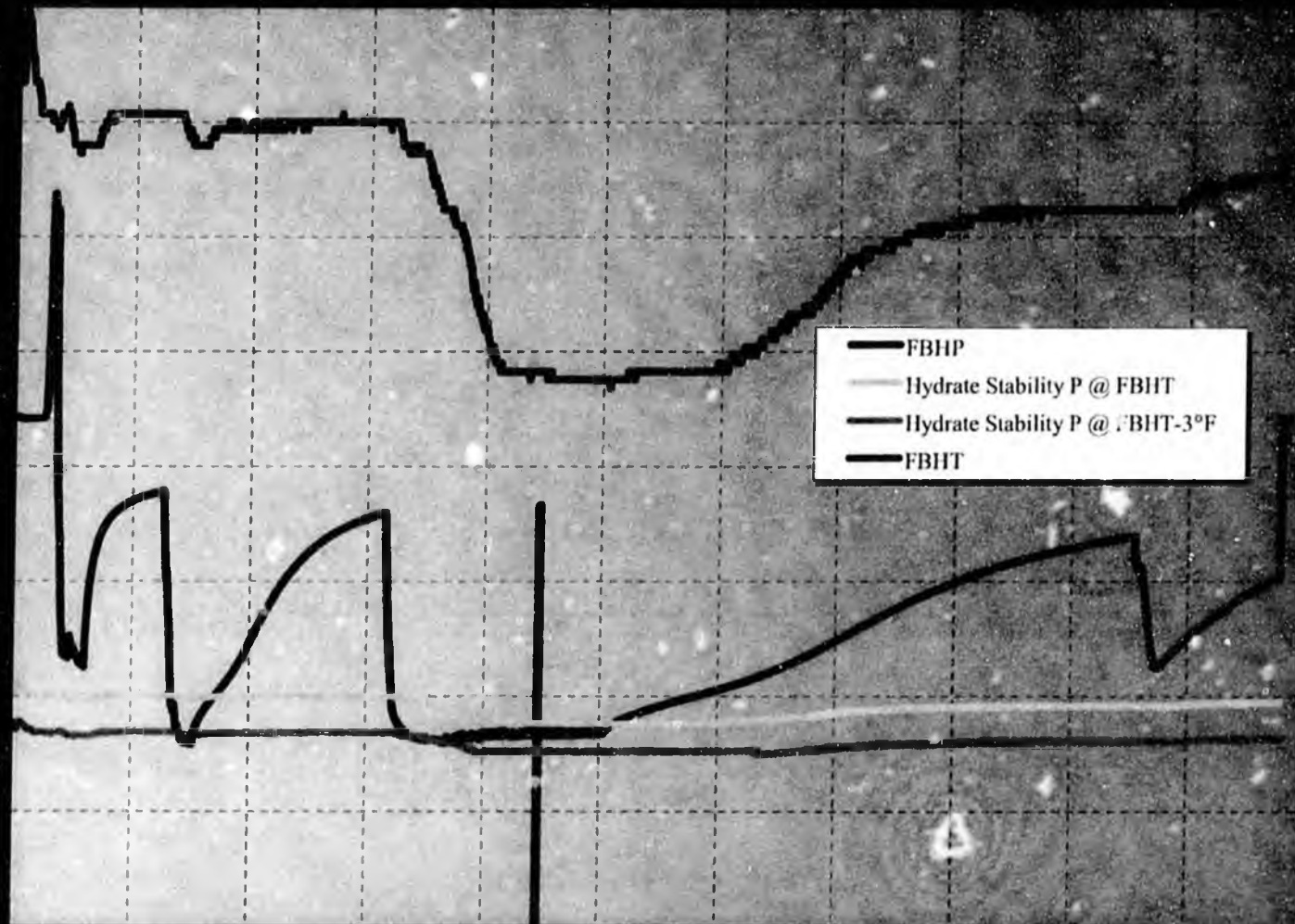
Information from Tim Collett (USGS)

Known Gas Hydrate Accumulations

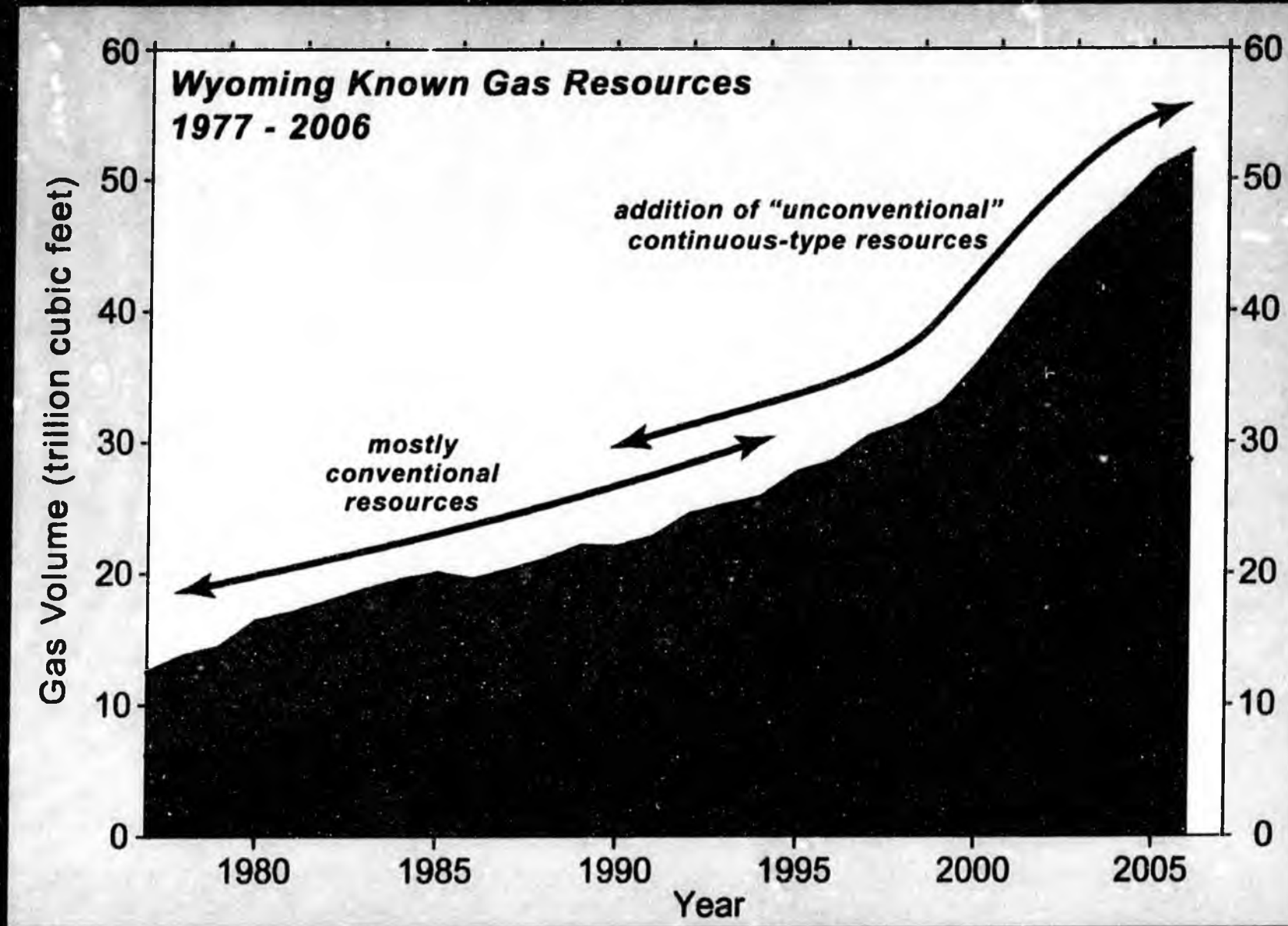


Known gas hydrate accumulations (blue) and hydrate-associated free gas accumulations (orange) in the vicinity of the major North Slope oil fields (green). The USGS estimates up to 100 tcf in place of hydrate in the Eileen and Tarn trends combined. From US Collett, 10/01 and Hunter and Collett, (2004).

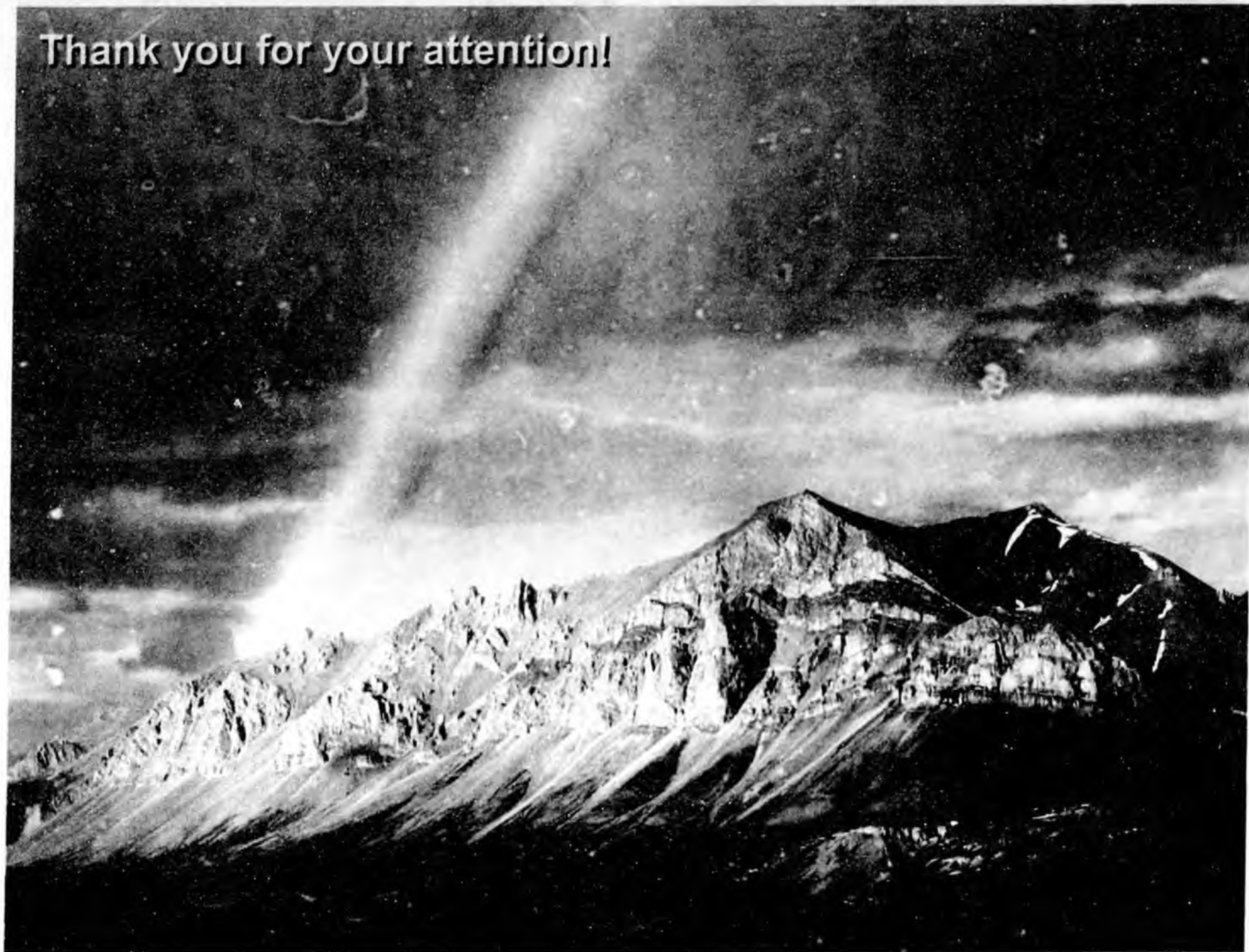
BP DOE Mt Elbert-01 MDT C2



Wyoming Gas Reserves & Production History



Thank you for your attention!



HB 3001

SB 3001

6/8/08

SPECIAL

SESSION

DOCUMENTS

AGIA Training Strategic Plan



Alaska Department of Labor and Workforce Development
Commissioner Click Bishop
June 6, 2008

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

Governor Sarah Palin
2008 State of the State Address





Gasline Workforce Goal

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



Workforce Development Process

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



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

Training System at a Glance

Secondary Education

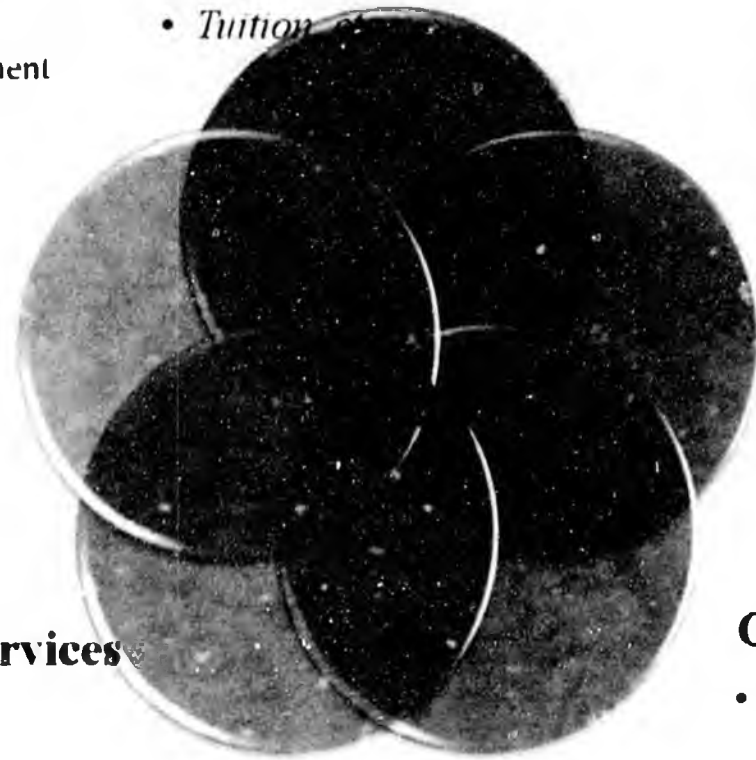
- Education & Early Development
- High Schools
- Adult Basic Education
- Youth First
- Construction Academies
- College Ready Work Ready

Employment Services

- Job Center Network
 - Counseling
 - Job Training Referral

Funding

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



Postsecondary Education

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

Grantees

- Competitive Selection

Challenges

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



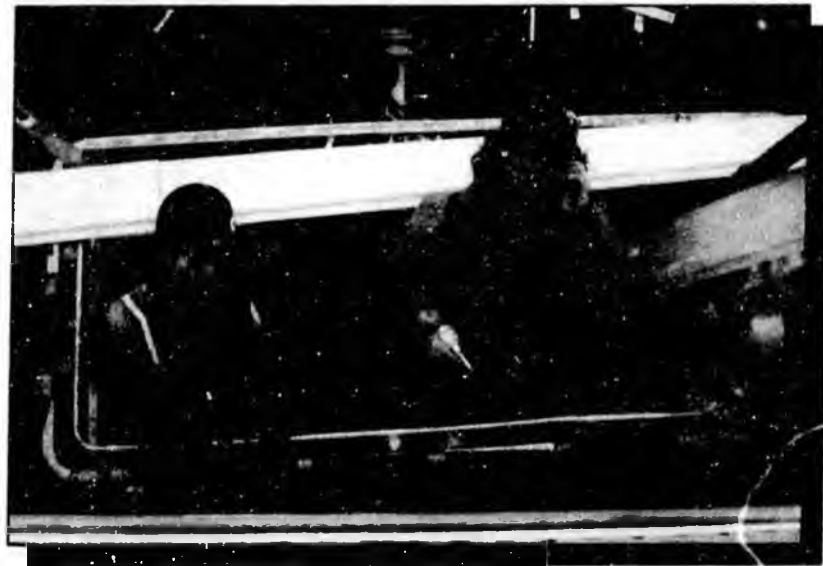
Four AGIA Strategies

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



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

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



2. Develop Comprehensive Career and Technical Education System

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



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

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



4. Increase Training for Operations, Technical and Management Workers

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



Our Focus

- Current skills gap
- Legacy and long-term jobs



Identifying the AGIA Skills Gap

Working with industry partners, DOLWD:

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



Alaska's AGIA Skills Gap

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





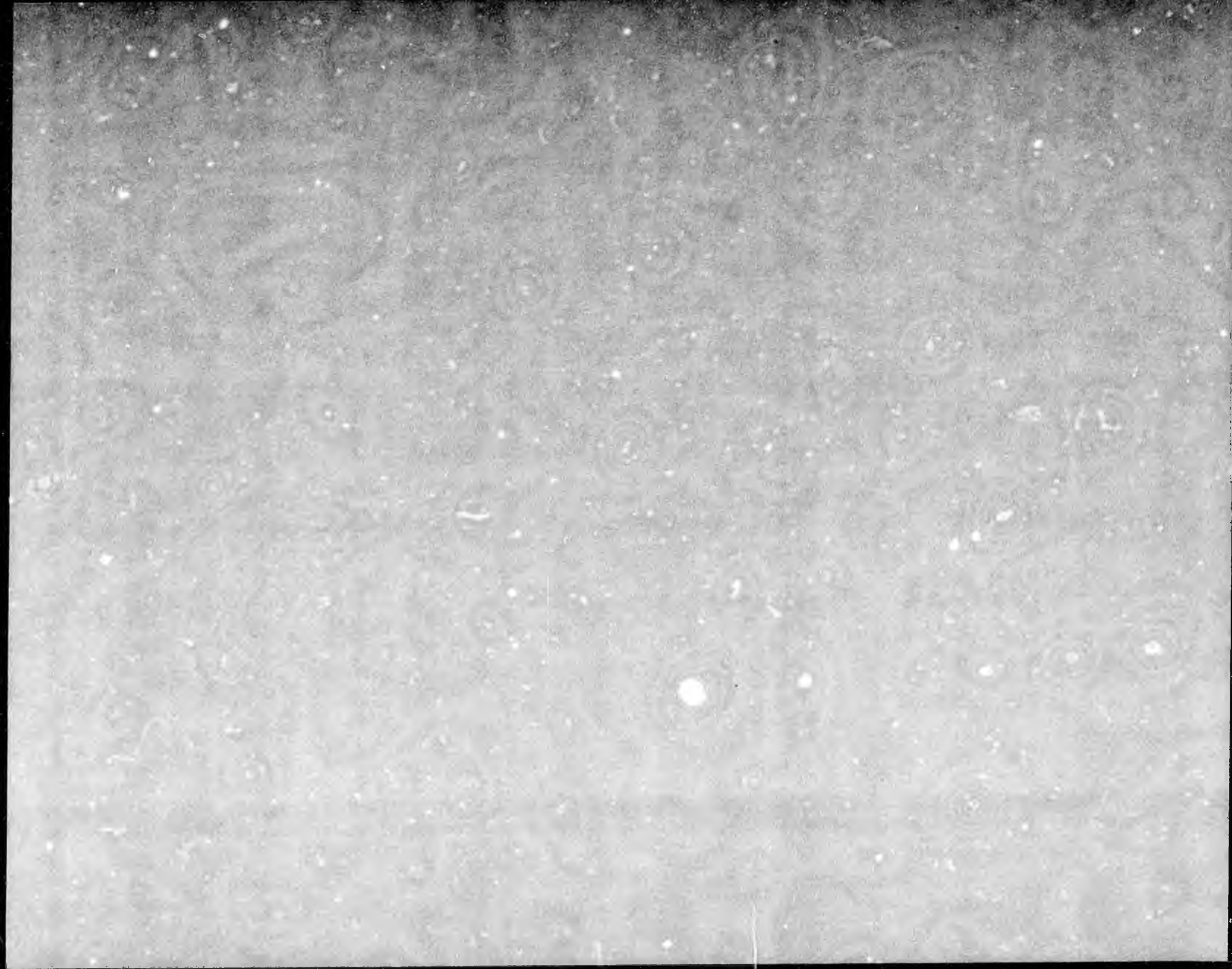
AGIA Occupational Data

Carpenters	17.0%	34.6%	\$26.33
Civil Engineers	12.4%	43.9%	\$36.64
Electricians	24.2%	32.7%	\$31.47
Operating Engineers and Other Construction Equipment Operators	18.3%	49.9%	\$28.10
Surveyors	18.1%	45.2%	n/a
Truck Drivers, Heavy and Tractor- Trailer	13.6%	48.8%	\$21.66
Welders, Cutters, Solderers, and Brazers	34.8%	40.4%	\$25.05

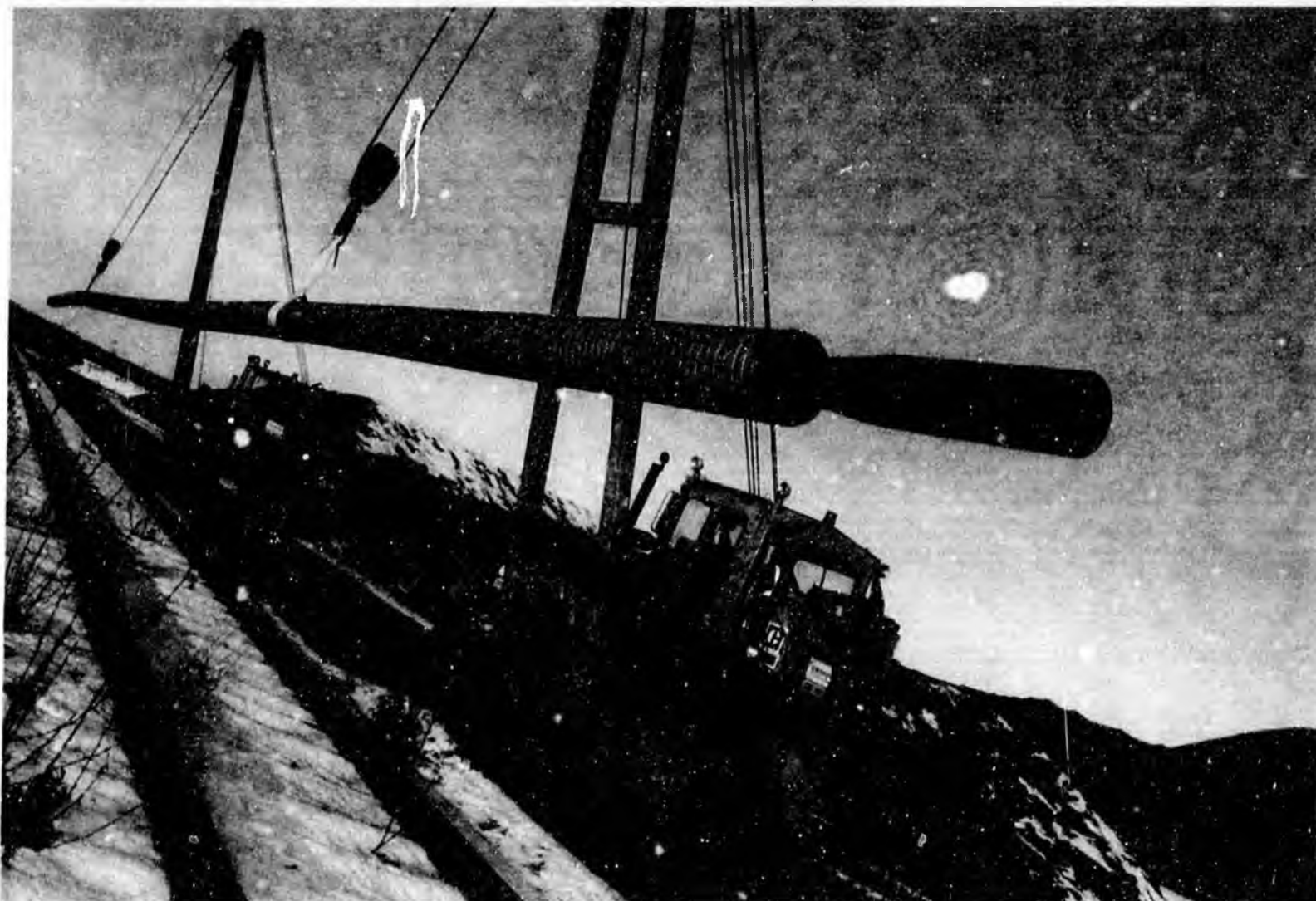
For More Information

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





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



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



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



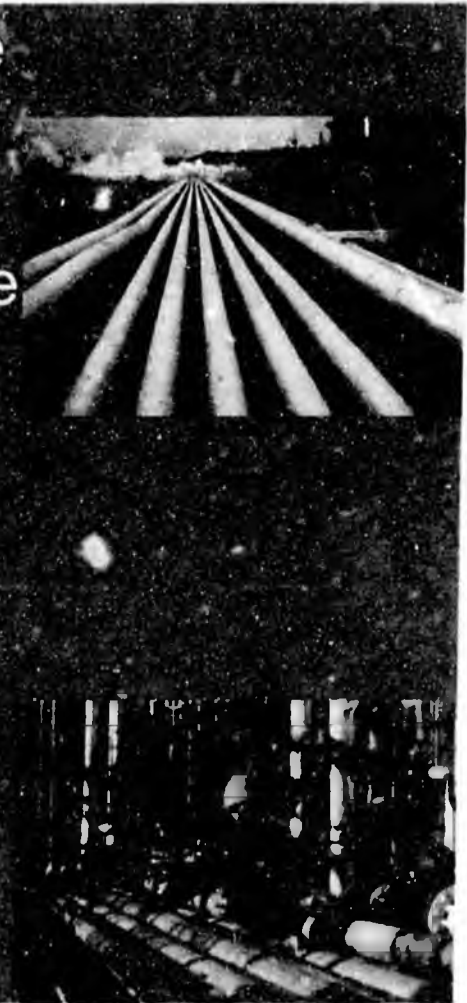
Construction Phase Assumptions

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



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



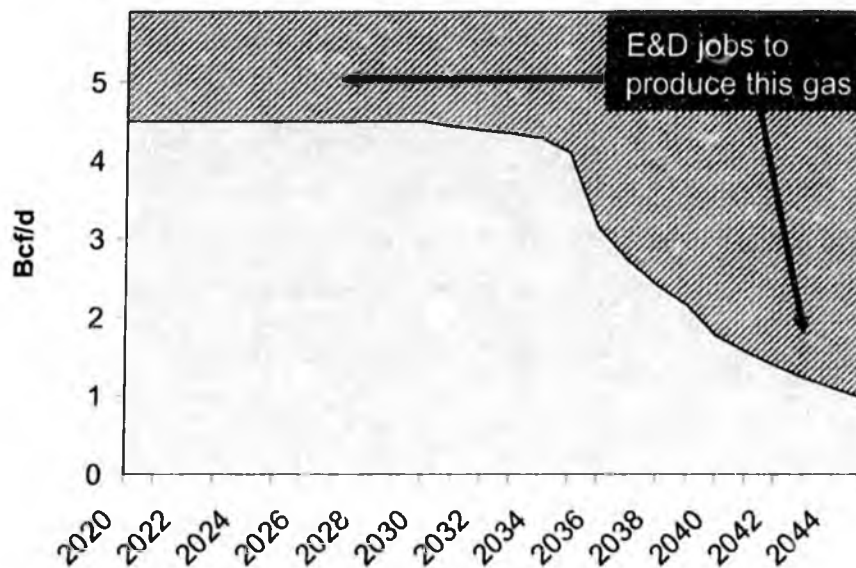
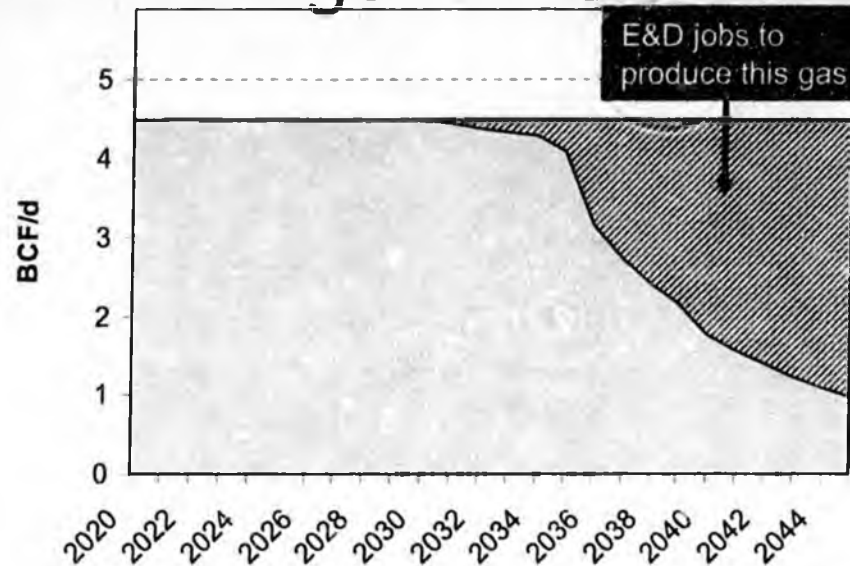
Operations Phase Employment Results

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



E&D Employment:

How we generated our results—Scenarios



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

E&D Employment: How we generated our results—Assumptions

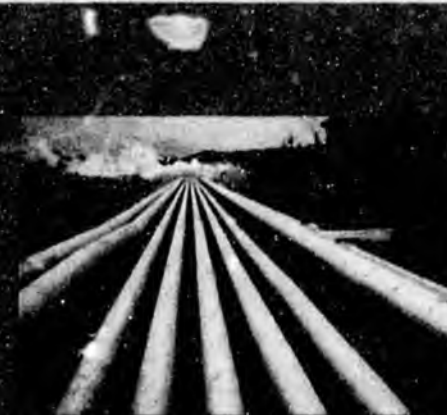
- New production facilities will be constructed in Alaska
- Fields will be brought on-line to keep the pipeline full at a given assumed capacity
 - 5.9 bcf/d for TC Alaska Scenario
 - 4.5 bcf/d for Non-Open Access Pipeline Scenario



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-Open Access Project

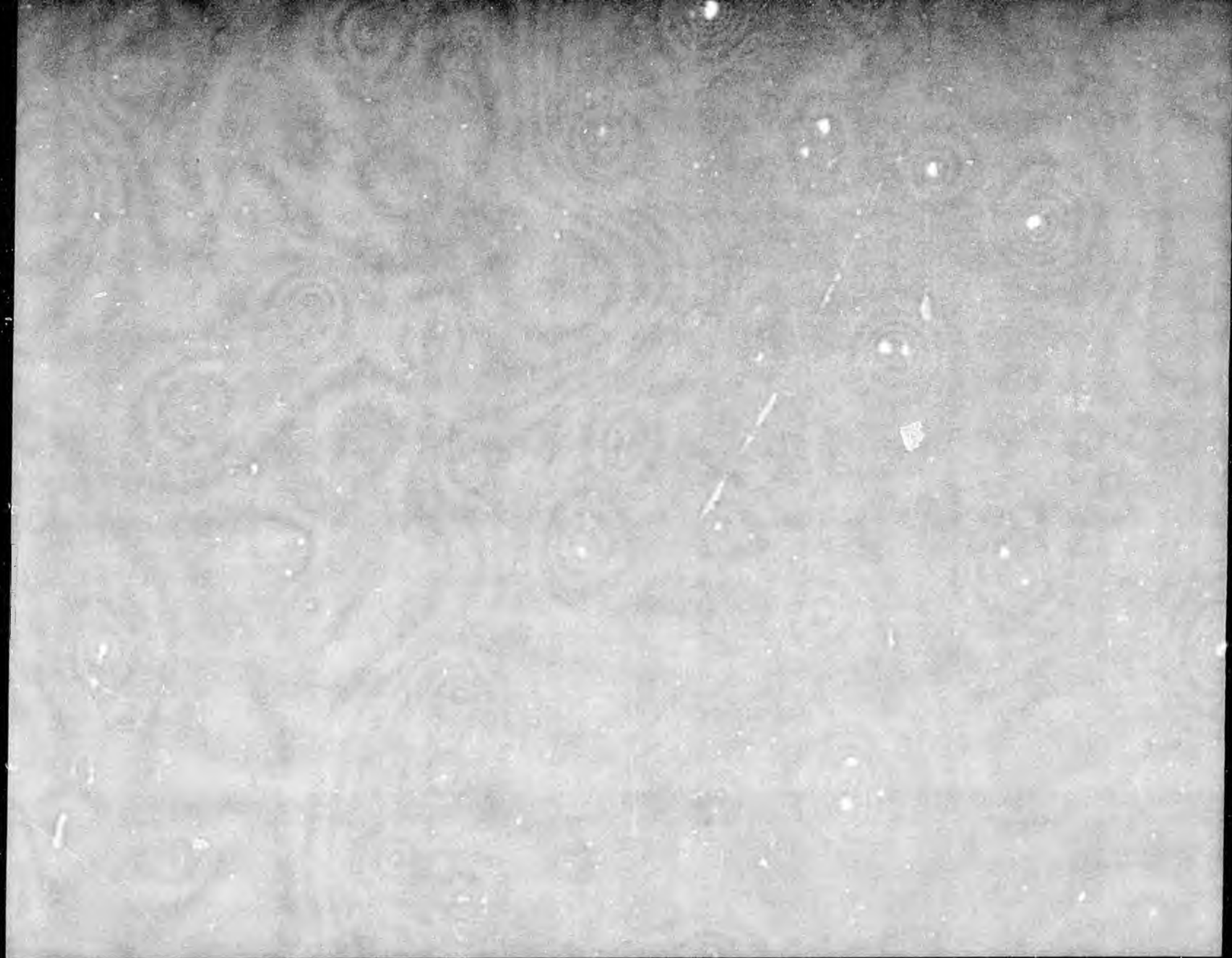
- Approximately 47,000 E&D jobs in the 2015 to 2045 timeframe
- Job creation may be delayed as late as 2026



Results: E&D Employment

- Timing of E&D job creation is a function of a pipeline's characteristics
 - Open Access = Jobs Sooner
 - Non-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





AGIA

The Alaska Gasline Inducement Act

Legal Issues Affecting Producer Participation

Spencer Hosie
Hosie McArthur LLP

Allan Van Fleet
Greenberg Traurig LLP

Duty to Develop and Market

- State of Alaska – Producer Agreement
- Lease Provisions
- Alaska Common Law
- “Move It or Lose It”
- AGIA Solution

Antitrust/Market Manipulation

- State and Federal Antitrust Laws

- Federal Energy Market Manipulation Laws

Antitrust Statutes

- Sherman Act §§ 1-2
- Federal Trade Commission Act § 5
- Alaska Restraint of Trade and Monopolies Act, AS §§ 45.50.562-596
 - Prohibit exclusionary conduct to maintain monopoly power
 - Prohibit joint action to withhold supply from the market

Standard Oil Monopoly



1910: Broken into "Seven Sisters"



Standard Oil of New Jersey (Esso)



Royal Dutch Shell (Anglo-Dutch)



Anglo-Persian Company (APOC)

Mobil

Standard Oil Co. of New York (Socony)



Standard Oil of California (Socal)



Gulf Oil



Texaco

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Fuels Markets

To help clients control a critical and potentially volatile component of the energy equation, ICF International assesses and forecasts natural gas, petroleum, and coal markets worldwide using deep industry expertise and proprietary models and databases. Our analyses and valuations have supported the financing of more than US\$10 billion in gas assets.

ICF's gas area expertise was augmented in January 2007 with the [acquisition of Energy and Environmental Analysis \(EEA\)](#), a national leader in gas market analysis.

- [Natural Gas Market Analysis](#)
- [Supply Assessments and Project Evaluation](#)



WHAT'S NEW


» [U.S. Emission & Fuel Markets Outlook](#)

Evaluating Natural Gas Gathering Facilities. On behalf of an interstate pipeline, ICF International estimated the value of a nonjurisdictional gathering pipeline system. The analysis used the EADSS™ to examine the implications of possible new production coming on line, gas market prices on different connecting pipelines, and competition from nearby gathering systems. The analysis showed the expected stream of revenues and the high and low values associated with project uncertainties.

Pacific Northwest Gas Storage Strategy Study. ICF International used EADSS™ to evaluate strategies for purchasing or releasing transportation capacity and purchasing gas storage capacity. The work was performed for the owner of a gas-fired generator and thus

Alaskan Pipeline. For producers on the Alaskan North Slope, ICF International evaluated the effect of Alaskan and MacKenzie Delta gas on U.S. and Canadian gas markets, prices, and pipeline flows. We evaluated various scenarios to assist the producers in understanding the implications of different assumptions and configurations for bringing frontiers supplies into the

market.

TOP 

Market Manipulation Statutes

Energy Policy Act of 2005

- Gives FERC new enforcement powers over natural gas and electricity markets
- FERC imposed \$200 million penalty in one pending case; nearly \$100 in another (in addition to disgorging unjust profits)

Market Manipulation Statutes

The Energy Independence and Security Act of 2007

- Prohibits any manipulative or deceptive device or contrivance in connection with purchase or sale of crude oil or gasoline or petroleum distillates
- Authorizes FTC to prescribe regulations

FTC Advance Notice of Proposed Regulation

Identifies “Potential Practices” that may constitute market manipulation

Seeks comments “on the circumstances, if any, under which a firm’s decision regarding supplying a market (including whether to reduce, increase, or maintain unchanged the amount it supplies) should be considered manipulative or deceptive.”

FTC Advance

Notice of Proposed Regulation

Regulated petroleum pipelines may not allow new shippers a share of a pipeline's capacity when historical shippers seek to transport more petroleum products than the pipeline is capable of transporting. The Commission seeks comment on whether pre-announcements that pipelines are approaching capacity constraints may be a conduit for market manipulations or deceit"

FTC on BP in Alaska North Slope

FTC required BP to divest ARCO's ANS holdings to Phillips (now ConocoPhillips) "the Commission had reason to believe that BP occasionally had exported ANS crude oil to the Far East in order to increase spot prices for ANS crude oil on the West Coast and that BP benefitted from those higher spot prices because of its status as a merchant marketer."