

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILE 8672

1627 SCOMM 62 • SENATE SPEC. COMM. ON OIL & GAS, 1989-1990

1795

ALYESKA PIPELINE SERVICE COMPANY CORROSION PROGRAM

Pump Station Corrosion

- Comprehensive inspection program
 - Define scope of problem
 - Establish priorities
- Mitigation program
 - Linewide inhibitor injection
- Monitoring program
 - Evaluate inhibitor effectiveness
 - Identify further corrosion

ALYESKA PIPELINE SERVICE COMPANY CORROSION PROGRAM

Pump Station Corrosion

Pump Station 3 Repairs

- Bypass station
No throughput interruption
- Replace corrosion damaged pipe
Design enhancements
Internally coat replacement pipe
- Scheduled completion
Early 1991

ALYESKA PIPELINE SERVICE COMPANY
CORROSION PROGRAM

1990 Anticipated Corrosion Program Costs
(\$ million)

Mainline	215
Pump Stations	50
Valdez Terminal	20
Pig Runs / Engineering	<u>15</u>
Total	300

ALYESKA PIPELINE SERVICE COMPANY CORROSION PROGRAM

1990-1991 Throughput Impacts

- Pipeline has greater capacity than North Slope production
 - 2.1 million barrels per day
 - 1990/91 production less than 2.0 million bbl/day
 - No lost production make-up capacity
- Pipeline slowdowns / shutdowns planned to minimize lost production
 - Scheduled field maintenance periods
 - Windows of opportunity

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PRICE

SPECIAL REPORT

Corrosion along the 800-mile
trans-Alaska pipeline could result
in a multibillion-dollar repair bill
costing the state millions in lost taxes

By **GEORGE FROST**
and **PATTI EPLER**

Daily News reporter

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The trans-Alaska pipeline, one of the biggest engineering feats of the petroleum age, is under fierce attack by an elemental force of nature.

The \$9 billion oil-delivery system is pitted with rust in hundreds of locations, and the repair bill could run into the billions of dollars.

Alyeska Pipeline Service Co., which runs the pipeline for the seven major oil companies that own it, vows the pipeline system is sound. Trouble spots are confined to isolated areas, Alyeska says. But the company stops short of assuring there is no chance of a rupture.

The danger of a disastrous oil spill is only one consequence of the pipeline's corrosion.

The state treasury also will be depleted. Pipeline owners are paying for repairs by raising their tariffs — or fees — for carrying the oil from Prudhoe Bay to Valdez. This higher fee lowers the value of North Slope crude and this year alone will cost the state an estimated \$21 million in taxes and royalties. In the next few years, the treasury could lose perhaps \$200 million due to corrosion repairs. And less oil revenue means the state will be sending Alaskans smaller permanent fund dividends each year.

Please see Page A-6, **PIPELINE**

Federal agencies caught off-guard by extent of corrosion

By **PATTI EPLER**
and **GEORGE FROST**

Daily News reporter

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In April 1988, Perry Francis gave the trans-Alaska oil pipeline his blessing.

"I am convinced that corrosion is under control on (the pipeline) and the corrosion program is working effectively," wrote Francis, a federal Bureau of Land

Management engineer, in a memo.

Less than six months later, Alyeska Pipeline Service Co. was reporting an alarming amount of corrosion on the 800-mile pipeline; more than 200 spots were suspected of serious rust.

Last July, 15 months after Francis concluded corrosion was under control, Alyeska quadrupled its estimate of

trouble spots. Alyeska said it would have to spend hundreds of millions of dollars to save the pipeline.

BLM and the federal Department of Transportation, both of which regulated the pipeline, concede they were caught off guard when substantial corrosion surfaced. Now DOT is investigating possible violations of federal law.

Both agencies are hiring more engineers and vow to scrutinize Alyeska more closely.

For the past 13 years, both agencies' oversight consisted largely of accepting whatever Alyeska told them about the pipeline and corrosion. They lacked expertise to interpret corrosion data supplied by the

Please see Page A-8, **REGULATORS**

WHAT HAPPENED?

The corrosion crisis has provoked an engineering and construction boom that could grow into the biggest Alaska project since the pipeline was built in the mid-1970s. Union hiring halls expect calls for hundreds of truckers, pipe fitters, carpenters and laborers in a corrosion fight that could continue as long as the pipeline moves oil.

Alyeska has assembled a team of hundreds of people to combat the corrosion.

The company has launched an accelerated repair program and last year welded new pipe over 31 spots where the main line was judged too weak to safely contain the crude.

Over the next three years, Alyeska says, it will spend as much as \$800 million on corrosion control. The state thinks the repair bill could top \$1.5 billion. No one knows the price tag for sure until Alyeska digs up more pipe and completes a thorough analysis, the company says.

The worst corrosion discovered so far has been confined largely to a 14-mile segment, 160 miles south of Prudhoe Bay, where the pipe is buried in a floodplain and its corrosion-protection coating is peeling off.

But throughout the 800 miles of pipeline Alyeska has found hundreds of problem spots.

The pipeline itself is not the only Alyeska facility under attack by rust. Other problems include:

- Interior corrosion at the eight northernmost of the pipeline's 12 pump stations has gotten bad enough to require \$50 million in repairs next year, with \$30 million going to rebuild Pump Station 3 just north of the Brooks Range.

- At the Valdez terminal, where 75 tankers call each month to haul crude oil to Lower 48 refineries, several key environmental protection systems have been riddled with corrosion for years, and storage tank bottoms are getting rusty. Repairs are costing at least \$125 million.

- Corrosion has attacked gas lines providing fuel to pump stations 1 through 4. No cost estimate for repairs is available.

- At North Slope oil fields, corrosion keeps dozens of technicians busy every day. Arco Alaska Inc. and BP Exploration (Alaska) Inc. will spend \$34 million this year to fight rust. For Arco, the Prudhoe Bay problem is so serious the company spends 20 percent of its field operating budget on corrosion.

Alyeska's corrosion problem has prompted an investigation by the federal pipeline safety office, according to Jack Overly, head of that agency's Denver office.

The company faces fines of hundreds of thousands of dollars if investigators find it broke safety rules building or maintaining the pipeline.

All metal is subject to decay. At its most elemental level, pipeline corrosion is simply the process of steel deteriorating into its original state. Energy used to turn iron ore into steel doesn't stick around forever; corrosion is the goodbye note.

The trans-Alaska pipeline is the nation's most important oil pipeline. Daily it moves 1.9 million barrels of hot petroleum — one-fourth of U.S. oil production — toward refineries that turn it into gasoline, jet fuel, heating oil, plastics and other petroleum products.

Almost half the pipeline is underground, an environment especially conducive to corrosion. The buried pipe is encased in a thick bulb of warm soil that has been thawed by the hot oil in the pipe. The melted soil conducts the electrical charges that cause corrosion far more readily than frozen permafrost.

"The warmer the earth from pipeline heat, the more active the corrosion," wrote A.W. Peabody, designer of Alyeska's corrosion system, in a 1979 technical journal.

Pipe buried in river drainages is particularly vulnerable because it's bathed in moisture.

The company says it always has done everything it could to stop corrosion. To do less, said spokesman George Jurkovich, would be to jeopardize "Goal 1," moving oil through the pipeline.

From before construction, oil executives promised the pipeline would be protected by the best means available. The steel was a special alloy, highly resistant to rust, they testified. The pipe was to be coated with a proven epoxy, and sealed with special insulating tape to keep out water and impurities that can cause rust.

Alyeska's corrosion plan in 1974 — the year construction began — promised to "insure the integrity of the pipeline from a corrosion standpoint over an operating life of 30 years."

Alyeska adapted familiar methods to fight corrosion in the harsh arctic environment, including visual and electronic inspections, and a buried "cathodic protection system" — miles of

draw off natural electrical currents that flow through the pipe and cause corrosion, weakening the steel.

STEEL EXPOSED TO ELEMENTS

But those safeguards may have been undermined even before oil began surging through the line.

The highly touted Japanese steel used in the pipe was not particularly resistant to corrosion, according to Harry Brandt, an engineering professor at the University of California at Davis who warned in 1972 the oil industry had exaggerated the quality of its steel.

Even the best steel will rust if it is mistreated. This pipe was exposed to salt air and spray during shipment from Japanese steel plants in 1969 and 1970. Some of the 100,000 lengths of pipe sat outside, exposed to Fairbanks snow and ice fog, for more than a year.

In 1971, all the pipe at the three storage yards in Fairbanks, Prudhoe Bay and Valdez got a protective coating of Scotchkote, an epoxy resin made by the 3M Co.

But the resin worked poorly, according to Bill Howitt, Alyeska's engineering manager. Some coating flaked off the pipe, exposing the steel. Alyeska calls this disbonding. The coating also cracked when the pipe was bent during installation. Alyeska sued, charging that 3M had altered the coating's formula and used an "inferior substitute." Attorneys for 3M argued the bare pipe was already so contaminated the coating could not be blamed. The lawsuit was settled in 1981 for an undisclosed sum.

Rather than strip off the bad coating Alyeska wrapped the pipe in tape, according to Howitt and others. Federal regulators approved the move during the last winter of construction as Alyeska pushed to finish the line. The first wrapping of tape didn't work, Howitt said, so the company rewrapped the pipe with a second layer.

In the Atigun floodplain, where the most extensive corrosion has been found, construction workers had serious problems wrapping the pipe. The pipe had to be heated to 200 degrees for the coating to bond, a difficult chore in minus 20- and minus 30-degree weather, Howitt said. The tape wrap was prepared and applied improperly, he said.

Today, most of the external corrosion appears to be caused by the pipe losing its seal of epoxy coating and protective tape, Howitt said. The pipe is getting exposed. This is an insidious problem that can't be prevented or detected before it causes corrosion save by digging up a lot of pipe, he said.

"Nothing protects against disbonding," he said. "Nothing."

A key question — so far unanswered — is whether the corrosion resulted from isolated defects, or a systemwide failure of the seals all along the buried sections of the pipeline.

Alyeska has known for years
Alaska's oil faucet was starting to rust.

The company found minor corrosion in the early 1980s when parts of the protective coating lost its seal, according to internal Alyeska reports. Throughout the mid-1980s it knew that its cathodic protection system was failing to protect miles of pipe, company reports show. And the company performed a major corrosion repair in 1988.

In 1983, Andy Smart, then Alyeska's chief corrosion engineer, proposed a \$70 million, six-year program that included retaping substantial sections of the pipeline, according to a federal Bureau of Land Management memo. BLM is the primary government regulator of the pipeline.

Don Knight, then BLM's chief corrosion engineer and author of the memo, said Smart frequently tried to persuade Alyeska management to focus on corrosion, with little success until 1983.

Smart declined an interview about his work at Alyeska.

Jurkovich, the Alyeska spokesman, denied any such proposal was made.

Any substantial corrosion-control work that engineers may have recommended was derailed by an extensive analysis by Battelle Petroleum Technology Center for Alyeska. Based on that study, Alyeska concluded in 1984 the pipeline was in "excellent condition." There was no evidence the pipe wrap and cathodic protection system were "suffering from accelerated deterioration," according to Alyeska reports.

So Alyeska reduced its corrosion-monitoring program. It would dig up the line about 12 times a year looking for corrosion instead of about 200. The company canceled plans to develop in-house a more sensitive "pig" — a high-tech device that runs through the pipe to check its shape and thickness.

Alyeska looked to other companies to develop a smarter pig.

NKK Corp. of Japan and a Canadian firm were separately developing more sophisticated pigs.

Pigs look for "anomalies" — deviations in the standard thickness of the pipe. Not all anomalies represent dangerous corrosion.

Earlier pigs could "see" anomalies at least a quarter-inch deep, or half the thickness of the pipe. The Canadian pig could pick up anomalies one-seventh of an inch deep.

In 1987, the Canadian pig turned up 14 anomalies. The next year a second run of the same pig showed 241 anomalies when engineers used a new method to interpret the data.

Alyeska engineers were skeptical they would find significant corrosion in buried pipe, Howitt said. But of the first 98 checked, 81 were

corrosion-related. A dozen damaged spots were repaired with pipe sleeves.

Last spring, the new NKK pig went down the line. The Japanese company promised its pig could detect anomalies of only one-twentieth of an inch deep. Altogether the smart pigs found 827 anomalies. Alyeska realized it had a serious problem.

Alyeska spokeswoman Marnie Isaacs said engineers are studying readings from the pig more closely using a different method to re-evaluate the data. The company expects to have many new points — perhaps thousands more — to investigate, she said.

FRUSTRATING WORK

Alyeska hired more than 300 workers last summer to begin digging up and inspecting the pipe.

The work is expensive and frustrating.

At one location, workers carefully peeled away 29 feet of frozen earth to reveal the pipe. After sandblasting off the protective tape and coating, workers eyeballed the pipe for corrosion and scanned it with infrared instruments. This single inspection cost \$2 million. It found no corrosion.

But other crews doing similar work found plenty.

Corrosion has been discovered at 202 of the 215 sites dug up so far, said Jurkovich, the Alyeska spokesman.

The worst segment, in the Atigun floodplain about 160 miles south of Prudhoe Bay, is to be replaced next year. Replacing nine miles of pipe will require a two-day shutdown of the pipeline.

Engineers fear they might lose pressure in the Prudhoe Bay oil column in a longer shutdown. That means thousands of barrels of oil that otherwise could be pumped might never be recovered. But Alyeska promises to get the job done in time by building an entire replacement section alongside the damaged pipe, making quick cuts to attach the new line, Howitt said.

THE STATE TAKES A LOOK

State officials say they were as startled as Alyeska says it was by the extent of the rust.

The state is concerned that repair costs are being added to the pipeline

from the price of oil before taxes and royalties get paid.

Chuck Logsdon, the state's chief petroleum economist, estimates the state will lose \$200 million if the tariff rises to cover \$800 million in corrosion-related expenses.

Late last year, Attorney General Doug Baily assembled lawyers, accountants and corrosion consultants to investigate. After their initial work, the state opposed adding corrosion cost to the tariffs in a protest filed with the Federal Energy Regulatory Commission, which oversees tariffs on U.S. pipelines.

The state alleges protective safeguards were undermined by the frantic pace of construction. Damaged pipe, defective wrapping materials and inadequate testing all may have contributed to later problems, the state says.

"If it was foreseeable and they knew they had problems and could have avoided it, at some point they can't roll that cost into the tariff and they can eat those costs," Baily said.

Alyeska attorneys argue the state gave up its right to challenge tariff increases caused by defective design, construction and maintenance in 1985, when it signed an agreement to settle a dispute over pipeline tariffs.

The state has established a pipeline office and is planning to share office space and technical information with BLM.

"We are expecting the monitoring and corrosion to be an ongoing issue," said Jerry Brossia, who heads the new office.

Brossia said the state made a serious mistake by ceding authority and responsibility for pipeline monitoring to the federal government.

"It's foolish and certainly imprudent not to be actively looking at it," he said.

When the state opted out of oversight, scrutiny of the pipeline fell on BLM and the DOT's pipeline safety office, both of which concede they didn't have the expertise to analyze pig results or perform independent analyses of corrosion.

Both BLM and DOT are expanding their budgets to look closer at the pipeline problems.

Congress also is starting to pay attention.

U.S. Rep. George Miller, D-Calif., who chairs an Interior subcommittee challenging oil company practices in Alaska, links pipeline corrosion to opening the Arctic National Wildlife Refuge east of Prudhoe Bay to oil development.

The oil industry "wants us to extend the life of that system another 25 to 50 years by allowing new drilling onshore and offshore," Miller said. "They tell us everything is just fine... that it's state of the art. Well, I think there's some question as to whether or not that's true."

REGULATORS: Agencies caught off-guard by the extent of cor

Continued from Page A-1

company and never hired consultants to help them out.

The April 1988 memo from Francis lauding Alyeska's corrosion effort is a case in point. Francis wrote it after only reviewing a 45-page company report and talking with a senior Alyeska engineer, according to his memo.

BLM is the main pipeline watchdog. DOT's pipeline safety office is in Denver, and officials there rely on BLM for information.

The state, pleading lack of money, shut down its oil pipeline monitoring office in 1979. Last fall, driven by the public outcry over the Exxon Valdez oil spill and the discovery of substantial corrosion, the state resurrected the office.

BLM said it's doing an effective job.

"I don't believe there's another pipeline in the United States ... that gets the scrutiny the trans-Alaska pipeline gets," said John Santora, deputy director for minerals for BLM.

Francis said he spends half his time in the field, and when he's not there another BLM inspector

is. "I can't say we've seen all the corrosion that's been dug up," Francis said, but he thinks officials understand the problem and how Alyeska is working to solve it.

Alyeska is required to reimburse BLM for any expenses. Alyeska pays the salaries of BLM engineers and other staff. Pipeline inspectors fly on Alyeska helicopters, stay in Alyeska housing and drive Alyeska trucks. Alyeska knows when inspectors are coming and where they're going.

BLM officials say Alyeska does not dictate their budget. BLM sends Alyeska a bill and Alyeska has never quibbled over payments, they say.

Through the 1980s, that bill got smaller. BLM cut its budget every year from 1982 to last year, when corrosion became a significant problem, according to BLM reports. The budget fell from \$1 million in 1982 to \$300,000 in 1987, before rising to \$500,000 last year. Staffing fell from 24 workers to six today.

Mike Menge, head of BLM's pipeline office for the past 20 months, said BLM cut spending due to a higher degree of confidence in the pipeline and

Alyeska. "Over time, an awful lot of the anxiety associated with the original construction went away," he said.

The relationship has caught the attention of U.S. Rep. George Miller, D-Calif., chairman of a subcommittee scrutinizing the Alaska oil industry. Miller prompted the General Accounting Office to investigate pipeline corrosion and whether BLM and DOT have shirked their duty to the public.

"I think what's happened over the life of this project is that everyone's gotten far too cozy," Miller said. "I think the policy makers have bought into the company line, which is, 'We know what we're doing.' I think that now has been discredited and if those relationships (between BLM and Alyeska) need to be changed, then so be it."

Menge said he trusts the integrity of his staff.

"The bottom line is you just have to do your job and not take anybody's word for anything," he said.

Yet BLM reports reflect mainly Alyeska's corrosion work and not independent checks by federal agencies.

BLM also appears to have assumed the role of a protective

big brother to Alyeska.

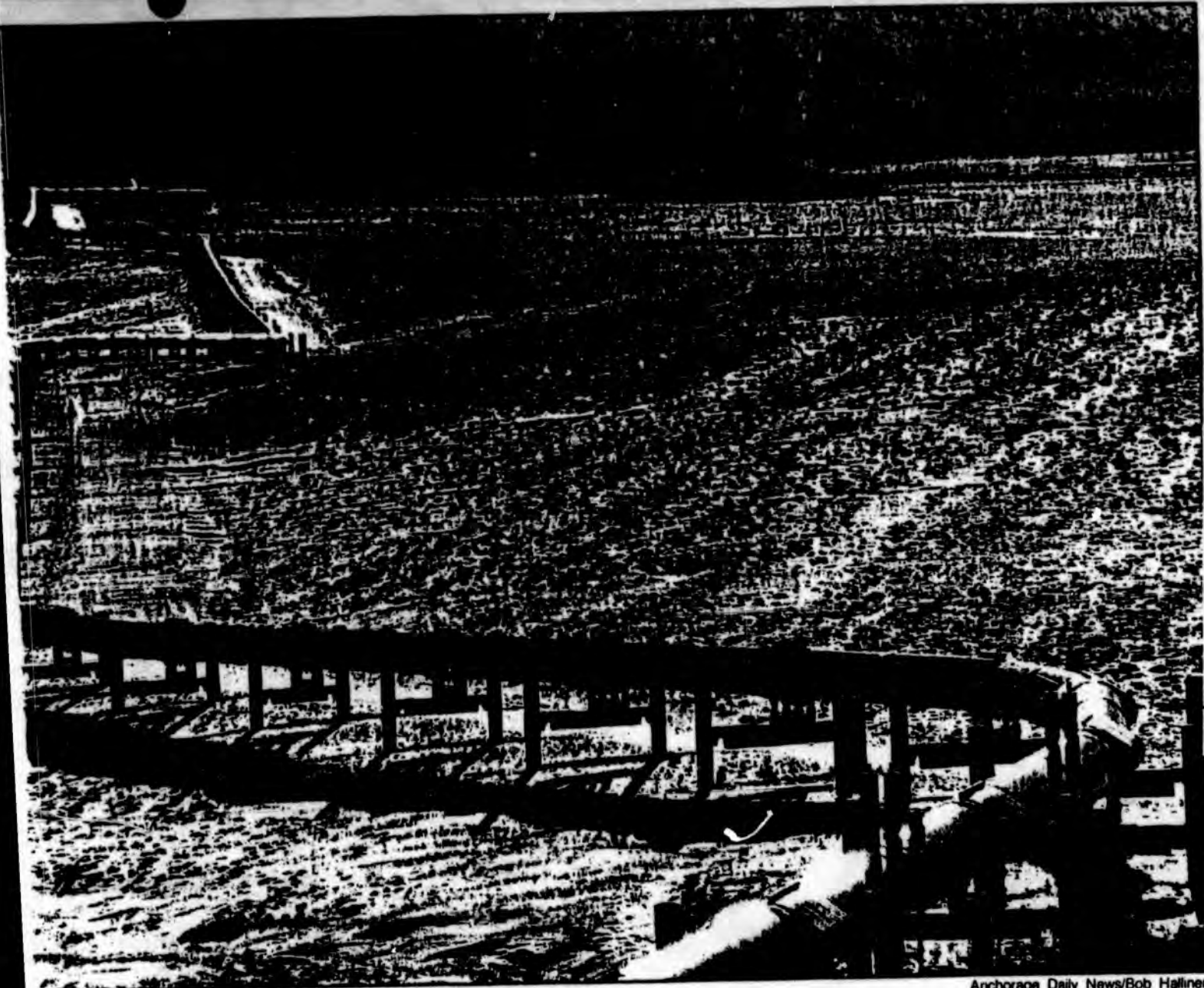
Last December, weeks after Alyeska had already briefed the press, legislators and other officials on the extent of corrosion, BLM's Santora refused to say how much corrosion had been found until getting clearance from Alyeska. When BLM called Alyeska, a secretary rushed in to interrupt George Jurkovich, a company official, from a meeting.

"I said, 'What are they asking us for? We've been telling everybody and his brother that (number) for months,'" Jurkovich said.

Since the corrosion issue arose, the DOT has started making annual visits to Alaska, said Jack Overly, head of DOT's Office of Pipeline Safety in Denver.

Mainly inspectors review Alyeska records, although they do accompany Alyeska and BLM officials on a tour of the pipeline, he said.

Last year inspectors also started coming to Alaska to check out safety problems, he said. Alyeska is required to notify DOT when corrosion reaches a certain depth in areas under high pressure and could pose a threat to the line. The company sent DOT a flurry of those reports last spring and they've continued



Anchorage Daily News/Bob Hallinen

ear Pump Station 4 in the Brooks Range

Overly couldn't say how much his office spends to oversee Alyeska. He said the office has a travel budget of about \$80,000 a year to visit dozens of pipelines in 12 states, including Alaska.

DOT has three engineers on staff and is proposing to hire two or three more in the next few years to deal with the Alaska pipeline, Overly said.

One new DOT engineer may wind up being stationed in Alaska, working out of an office shared with the state and BLM. The three agencies hope to team up to finally get a regulatory grasp on the corrosion problem.

The state, facing the loss of hundreds of millions of dollars in taxes and royalties as corrosion repair bills climb, has hired a firm of corrosion experts from Ohio to conduct an independent investigation.

But BLM continues to look to an unprepared DOT for help in sorting through the reams of technical data and reports being produced by Alyeska.

BLM staffers lack expertise to understand Alyeska's data, Menge said. "We rely on DOT's experts for that," he said.

"We don't have that expertise," said Overly.



Other problems along the line

By PATTI EPLER

Daily News reporter

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The trans-Alaska pipeline is not the only piece of Alaska's oil machinery in need of major overhaul.

Here is a summary of the major problems from Prudhoe Bay to Valdez.

THE PUMP STATIONS

A significant portion of the piping at Pump Station 3 on the northern flank of the Brooks Range will be replaced within the next year. Corrosion caused by a bacteria has devastated the pipe.

The \$30 million repair job includes removing and replacing hundreds of feet of pipe within the pump station, and involves slowing the flow of oil through the main pipeline for perhaps a month.

Alyeska Pipeline Service Co. has budgeted \$50 million to deal with pump station corrosion this year, including work at Pump Station 1 at Prudhoe Bay, which will require a half-day shutdown of the pipeline.

The bacteria is in water that accompanies oil through the pipeline. The corrosion occurs in "deadlegs," pump-station pipe installed for a future connection but never hooked up, according to Bill Howitt, Alyeska engineering manager.

Alyeska discovered the bacteria and related corrosion in 1988. Since then the problem has crept south to infect eight of the 12 pump stations that keep oil moving along the 800-mile pipeline. More than 1,200 deadlegs are suspected of having bug-related corrosion. Alyeska has inspected 800 and found corrosion in more than 120 spots, but only seven have been serious enough to require immediate repair, Howitt said.

WET INSULATION

Pipe buried in the permafrost beneath many pump stations became wet after just a few years of pipeline operation, and the company began finding extensive pitting.

Howitt said Alyeska is about two-thirds through a multimillion-dollar, six-year program to repair and reinsulate buried pipe. Alyeska has put in a new corrosion-control system that is designed to work when insulation gets wet, Howitt said.

CHEAP PIPE

At the Valdez shipping terminal, Alyeska has patched and replaced miles of corroded pipes carrying oily ballast water from tankers to a treatment plant.

Rust has attacked two different sets of carbon steel pipelines. Such pipe is cheaper than stainless steel but more easily corroded.

It took \$30 million and two summers' work to reline with a fiberglass coating nearly five miles of pipe running from tanker berths to holding tanks at the treatment plant, said Chuck O'Donnell, terminal superintendent.

And this year the company plans to spend \$11 million replacing another 3,700 feet of above-ground pipe with stainless steel lines, he said.

AIR POLLUTION CONTROLS

Alyeska's air pollution control system in Valdez has deteriorated almost from the day it began operating, costing the company at least \$35 million in repairs.

Three giant incinerators that burn toxic oil vapors are being rebuilt at a cost of about \$22 million. A \$5.5 million machine to remove condensation that corrodes pipe is being installed. And repairs to the pipes themselves are running in the millions of dollars.

So far, Alyeska has replaced about a mile of pipe, in some cases using more rust-resistant stainless steel instead of the original carbon steel pipe, O'Donnell said.

OIL FIELD RUST

The battle against corrosion at aging North Slope oil fields has escalated dramatically in the last three years, as engineers fight off corrosive acids, microscopic bugs and the arctic weather.

North Slope operators have more than doubled their spending on corrosion-control programs in the last two years — from \$34 million in 1987 to \$71 million in 1989 at the Prudhoe Bay field alone.

"I'd say there's not a week that goes by" in which the engineering staff doesn't face a new corrosion problem, said Bill Patterson, an Arco Alaska Inc. corrosion engineer.

"Any place you've got water in contact with metal you've got a potential for a problem," said Don Scheve, Arco's Prudhoe operations engineering manager.

There's lots of metal and water on the North Slope. At Prudhoe Bay, the largest oil field in North America, each of the 800 producing oil wells has 20,000 feet of steel casing and tubing. About 900 miles of pipeline carry oil, water, gas and other liquids. The most troublesome water is the 42 million gallons daily pumped from oil reservoirs. This water production has doubled since 1987, said Doug Webb, BP Exploration (Alaska) Inc.'s operations vice president.

BP has replaced more than two miles of pipe but never had a leak, Webb said.

Arco hasn't been as lucky. Two winters ago, leaks developed in an oil and gas line on Arco's half of Prudhoe Bay. The company replaced about three miles of pipe.

"That was the worst we'd seen at Prudhoe Bay," Scheve said.

Arco replaced a total of another seven miles of pipe in 1988 and 1989, Patterson said.

Trouble on the trans-Alaska pipeline

How corrosion is affecting the 800-mile pipeline

Corrosion is an electrochemical process that weakens metal by stripping away charged subatomic particles called ions. A corrosion circuit works much like a car battery with electricity flowing from an anode to another point called a cathode. The electricity flows through water, soil or acid.

How corrosion is affecting the buried sections of pipeline

The trans-Alaska pipeline is protected from corrosion by several safeguards. First it is coated with an epoxy that bonds to the steel. Next, the epoxy coat is wrapped in a special tape designed to keep out moisture. Finally, ribbons of zinc or bags of magnesium are attached to the pipe to divert electrical currents away from the pipe. Because they conduct electricity more easier than steel pipe, these sacrificial metals are supposed to corrode instead of the pipe. This is called a cathodic protection system.

1 External corrosion results from a failure of the epoxy coating and tape to keep water and acids away from the pipe.

Layer of protective tape

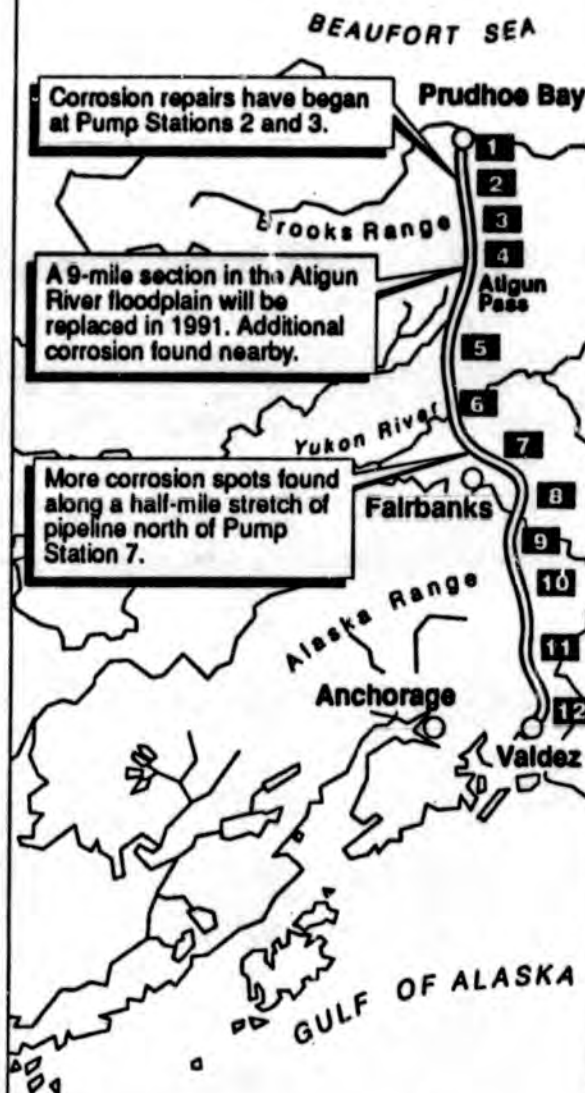
Epoxy paint

1/2-Inch thick steel pipe

2 A failure of the cathodic protection system to divert electricity to the sacrificial anodes further enhances the possibility of corrosion.

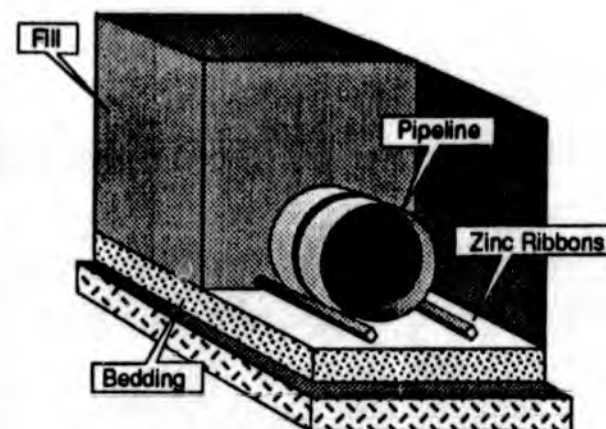
Zinc ribbon anodes

3 Water and acids begin to rust the steel pipe turning it to iron oxide.



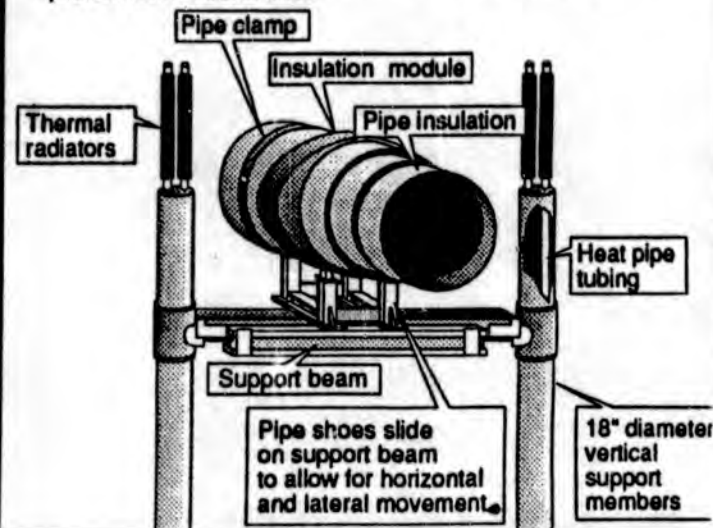
Cross section of buried pipeline

The Trans Alaska Pipeline is buried where stable soil and rock permit. A short section at Atigun Pass is buried in an insulated box atop a concrete slab.



Cross section of elevated pipeline

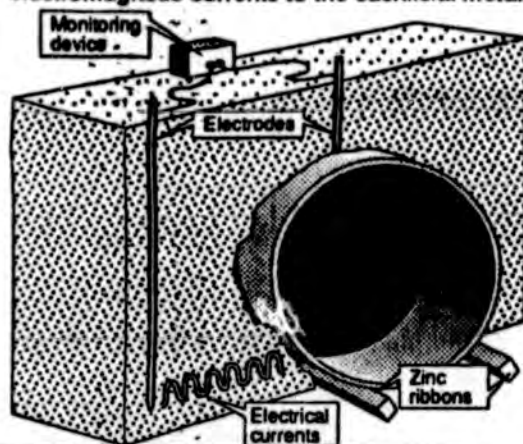
Above-ground supports, located every 60 feet allow for movement to accommodate expansion and contraction of the pipe or possible seismic disturbance.



How Alyeska monitors corrosion on the pipeline

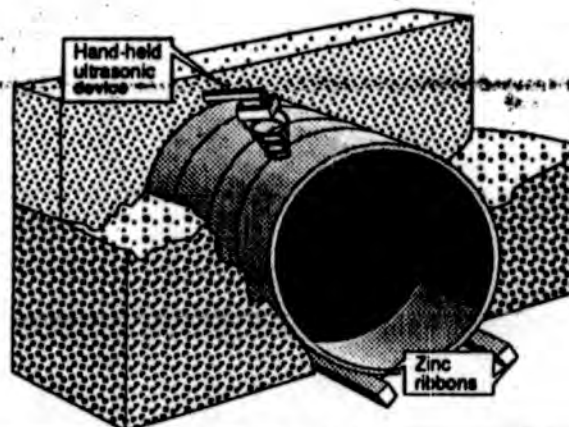
1 Annual surveys

Surveys are made of the pipe to measure the potential for electrical currents to flow from the pipe through the soil. Instruments measure whether the buried zinc strips are working. The zinc strips are part of the protection system designed to draw off electromagnetic currents to the sacrificial metal.



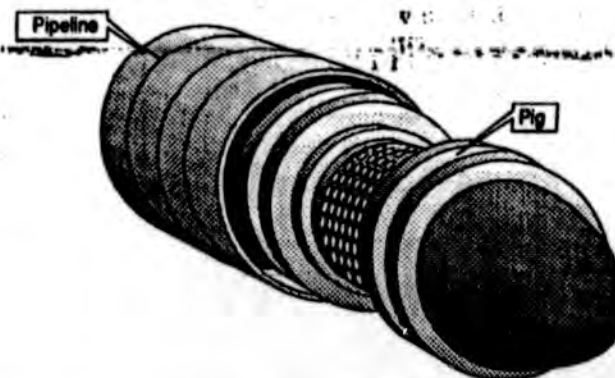
2 Digging up the pipe

The pipe is visually inspected for corrosion after stripping off the protective tape and epoxy coating. Hand-held ultrasonic instruments are also used to detect variations in the thickness of the pipe in areas where corrosion is suspected.



3 The corrosion pig

The pig is a self-contained tool equipped with 255 ultrasonic devices which measure the thickness of the pipeline wall by sending out sound waves and receiving the resulting echoes. It records readings for each square half-inch of the pipeline wall. The pig is 10 feet, 6 inches long, and 48 inches in diameter. It is made of titanium and weighs 6,600 pounds.



The Pipeline

Date oil was discovered: Nov. 20, 1968

Date construction began: 1974

Date oil was delivered: Aug. 2, 1977

Length: 800 miles

Pipe: Half-inch thick, 48-inches diameter

Construction cost: \$9 billion

Work force: 22,000

Length of pipeline buried: 400 miles

Number of vertical support members: 77,800

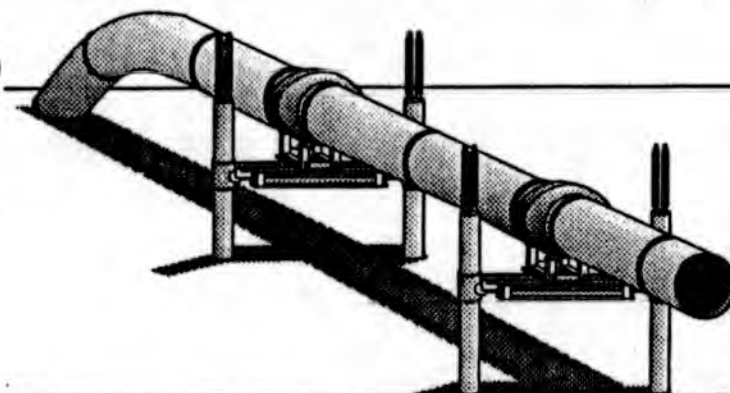
Highest elevation: 4,800 feet / Atigun Pass

Output: 80 million gallons of crude per day

Flow: 4.6 days to flow the length, at 7.35 mph

Temperature of oil: 140 degrees F

Capacity: 9 million barrels



SCOMM

62:6

1 IN THE SENATE

BY ADAMS

2

SENATE BILL NO. 97

3

IN THE LEGISLATURE OF THE STATE OF ALASKA

4

SIXTEENTH LEGISLATURE - FIRST SESSION

5

A BILL

6 For an Act entitled: "An Act relating to the oil and gas properties pro-
7 duction tax; and providing for an effective date."

8 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

9 * Section 1. AS 43.55.013(b) is repealed and reenacted to read:

10 (b) The economic limit factor for oil production of a lease or
11 property shall be computed according to the following formula:

12 $(1 - [PEL/TP]) \exp ([55,000,000 \times WD] / [PEL \times TP/Days])$

13 where: PEL = the monthly production rate at the economic limit;

14 TP = the total production during the month for which the tax
15 is to be paid;

16 WD = the total number of well days in the month for which
17 the tax is to be paid;

18 Days = the number of days in the month for which the tax is to
19 be paid; and

20 where "exp" indicates that the expression following it is an exponent.

21 * Sec. 2. AS 43.55.013(d) is amended to read:

22 (d) The monthly production rate at the economic limit for a
23 lease or property is [PRESUMED TO BE] 300 barrels times the number of
24 well days for the lease or property during the month for which the tax
25 is to be paid. [THE TAXPAYER MAY REBUT THIS PRESUMPTION AT A FORMAL
26 HEARING UNDER AS 43.05.240 BY PROVIDING CLEAR AND CONVINCING EVIDENCE
27 OF A DIFFERENT MONTHLY PRODUCTION RATE AT THE ECONOMIC LIMIT FOR THE
28 LEASE OR PROPERTY. THE HEARING SHALL BE HELD BEFORE FEBRUARY 15 OF
29 THE YEAR OR WITHIN SIX MONTHS AFTER COMMENCEMENT OF OIL PRODUCTION FOR

1 A LEASE OR PROPERTY. THE MONTHLY PRODUCTION RATE AT THE ECONOMIC
2 LIMIT FOR THE LEASE OR PROPERTY BASED UPON THE CLEAR AND CONVINCING
3 EVIDENCE OF THE TAXPAYER SHALL BE CALCULATED BY DIVIDING THE VALUE
4 DETERMINED UNDER (f) OF THIS SECTION INTO THE AVERAGE MONTHLY DIRECT
5 OPERATING COST DETERMINED UNDER (e) OF THIS SECTION AND SHALL BE USED
6 FOR PURPOSES OF THIS SECTION FOR ALL OIL PRODUCTION DURING THAT CALEN-
7 DAR YEAR FROM THE LEASE OR PROPERTY.]

8 * Sec. 3. AS 43.55.013(e) and (f) are repealed.

9 * Sec. 4. This Act is retroactive to January 1, 1989, and applies to
10 oil produced after December 31, 1988.

11 * Sec. 5. This Act takes effect immediately under AS 01.10.070(c).

Testimony of the
Alaska Oil and Gas Association
before the
Alaska State Senate
Special Committee on Oil & Gas
on
SB 97, An Act Relating to the
Oil and Gas Properties Production Tax/Changes in ELF

March 17, 1989

My name is Gerald Serena and I am a tax lawyer with Exxon Company, U.S.A. I am here today to present testimony of the Alaska Oil and Gas Association (AOGA). AOGA is a trade association whose member companies account for the majority of oil and gas exploration, production and transportation activities in Alaska.

AOGA believes that it is in Alaska's best interest to encourage responsible exploration and development of its hydrocarbon resources. We oppose the tax increases included in SB 97 since its passage would act to discourage continued development in Alaska's larger fields. In general, marginal developments in these fields that are already at risk due to soft crude price forecasts would be further hardened by the proposed tax increases. Increasing taxes on existing fields, after significant investment decisions have been made under the existing tax structure, is counterproductive to the complete development of these vast resources. In general, changes in the tax structure will require different risk analysis techniques, which could be a hindrance to future exploration and development.

Alaska's current tax structure has our industry paying higher taxes in this state than in any other. As you are probably aware, the production tax rate is the highest in the country, peaking at 15 per cent on gross production value. Taxes and royalties have provided 80 to 90 per cent of the state's unrestricted revenues in recent years and created the \$10 billion Permanent Fund. Surely oil and gas is paying its fair share by any measure.

Turning to the oil industry for more tax revenues would not be an effective approach to solving revenue problems brought on by crude price volatility, and which will be exacerbated in the near future with production declines from the major fields. This would only increase the State's enormous dependence on oil revenues while not addressing the long term problem of state spending levels.

In conclusion, AOGA strongly opposes the increased taxes in SB 97. Passage would unreasonably increase an already high tax burden, and would increase the state's dependence on volatile crude price swings.

ds:T14

Testimony, ELF
Senate Resources Committee
Juneau, AK
March 17, 1989

B. L. Odom
ARCO Alaska, Inc.

Good morning. My name is Ben Odom. I am Senior Vice President of Operations of ARCO Alaska, Inc. I appreciate the opportunity to offer testimony today concerning yet another proposed modification to the Economic Limit Factor of the Alaska Oil and Gas Properties Production Tax.

I feel certain that it will come as no surprise to you that ARCO Alaska opposes any changes to the Economic Limit Factor (ELF) which would have the effect of increasing the oil and gas industry's tax burden. We certainly identify with your problems concerning the potential budget deficit generated by the drop in crude oil prices. We have had to make a number of difficult decisions because of lower crude prices, including organizational restructuring and substantial reductions in costs, because our revenues, like yours, were and are, tied to the price of crude oil.

Our economics for making investment decisions contain two principal components. Estimated prices and estimated costs. We know we can't control prices, and we have learned we don't have the ability to predict them very well either. That leaves only cost. Other than the actual costs of transporting the crude oil, the largest single cost we have in Alaska is not the result of the remoteness of the fields or even the cold. The largest single item of cost we face in Alaska is taxes. Higher costs or lower prices result in exactly the same thing -- more oil left in the ground -- more oil that could be recovered becomes uneconomic to recover. That oil which is left in the ground because it is uneconomic will not return any royalties to the State, and it's from these royalties that the contributions are made to the Permanent Fund. It will not result in the payment of any production tax nor generate any income tax. Oil left in the ground will not create jobs. It will not utilize the facilities already available for its production, therefore, those facilities will generate less ad valorem tax revenues. The ELF helps to reduce the regressive effect of a gross production tax and prevent the premature cessation of oil production. Short-term fixes resulting in higher costs today have the result of removing jobs today and revenue from the future.

High crude prices have meant more tax and more royalty for the state. Those high prices have also equated to more crude oil reserves and more jobs to produce those reserves. However, reserves are not the equivalent of the total amount of crude oil in a reservoir. There is also an economic consideration. Reserves are instead only equal to the amount of crude oil that can be economically produced. Added crude reserves come when prices have been high enough to provide the economic incentive to pay for the technology specific to each reservoir and to pay for workers and equipment to implement that technology in each reservoir. Low prices mean reduced crude reserves; high costs likewise mean reduced crude reserves.

I want to show you this afternoon some information about the Kuparuk River Unit which should give you cause to move carefully in considering changes to the ELF. It is my understanding that the administration has prepared the 1990 budget based on a \$14 Gulf Coast North Slope crude price. I would like to call your attention to Exhibit I, which indicates the impact on the Kuparuk River Unit of a \$14.01 crude oil price. Kuparuk is the second largest oil field in North America with a current daily production rate of around 300,000 barrels. Our studies indicate nearly a billion barrels of oil can be produced with the existing wells and facilities. Half as much again is recoverable with additional capital spending. One might suppose that this field is an extremely profitable investment. But contrary to what you read in the papers or see on television, at \$14 a barrel, Kuparuk is anything but profitable. As the exhibit so clearly shows, the State already, with the current ELF, receives more than 100% of the available net revenue on each incremental barrel of crude.

Even at its current peak production rate, only the State of Alaska, not the Kuparuk investors, receives a profit. These numbers paint a rather bleak picture at \$14 a barrel. How can increasing the production tax burden by 50% over the next ten years, as SB-97 would do, be justified when you look at the economics? The State would certainly appear to be receiving a great deal more than a fair share of the available revenue.

The producer's return on each incremental barrel of oil will determine whether additional investments are made to produce more oil. Kuparuk has no natural

gas cap to force the oil from the ground. From the day the first barrel was lifted, pressure has been decreasing, and production on a per-well basis would decline without extensive additional investment in enhanced recovery projects. These new investments are very costly and can only provide for a slower decline in production than would otherwise occur. The loss per barrel that you see is the amount that must support the economic decision of whether we continue to create additional crude oil reserves in the Kuparuk River Unit. Do we operate a drilling rig to do well workovers to produce more barrels when we lose \$.14 on each barrel? Does it look better to double the production tax and increase the loss to \$.28? There is not a multiplier or an exponent which will convert this loss to an economic incentive to spend more money, to generate more barrels at a loss. What is at issue is the one half billion barrels in the ground that require additional wells and investment to produce.

We are currently looking at a long-range plan for Kuparuk involving what we hope to be a continuing development package. As attached Exhibit II shows, there are many development projects left to be done at Kuparuk, and they would require additional capital of almost \$1.6 billion and would create additional Alaskan jobs amounting to nearly 4000 man years of construction. Many of those projects will stay on the drawing board unless we have higher crude oil prices or lower costs -- or both. We can't do it without your help. The industry can't live with low prices and higher taxes. Among these projects, for example, is a drill site on the periphery of the Kuparuk field. Our plans call for a project consisting of 12 wells to be drilled on the site, providing an additional 12 million barrels of new oil reserves. Under the State's price forecasts and the present tax laws, this project is only marginally economic. If SB-97 is enacted, this project won't happen. Twelve million barrels of oil and effectively \$35 million in State revenue will be left in the ground. Of the \$35 million, \$7 million would go into the Permanent Fund.

The importance of tax burden in a project evaluation cannot be overstated. The ELF plays a pivotal role in mitigating the regressive nature of the Alaska production tax by taking into account the economic realities of oil field operations. Those realities are that it doesn't matter how large or small the field is, what does matter is that each new project must stand on its own by showing a positive net present worth. Although prices are still very low, the current ELF

provides a small but measurable incentive to help reduce some of the costs associated with producing more oil.

When I initially came to Alaska in 1968, the severance tax rate was 1%. A step production tax was introduced in 1974 to help mitigate the production tax burden on wells whose production was at certain low levels. This step methodology was modified in 1977 with the introduction of the ELF, and the maximum statutory rate was increased to 12.25%. Again in 1981 the statutory rate was increased to 15%, the highest production or severance tax rate in the nation. In addition, the application of the ELF was limited during the first ten years of production. As the curves in Exhibit III indicate for the Kuparuk Field, the burden on the production tax has not only changed by calculation method, but it has continually increased. Kuparuk would clearly be paying less production tax under prior laws than it would be paying under SB-97. As the top line of the graph plainly shows, SB-97 does not provide a slowly declining tax rate, or even a step decline, as production drops off. SB-97 is more on the nature of a cliff, where the production of the wells in the field must be so low before any reduction in tax is realized that under North Slope economic realities, the wells could not be operated at these production levels. This can be restated by saying that the Kuparuk Field will shut down before the ELF in SB-97 mitigates anything but an insignificant amount of the production tax.

An increase in taxes also has the direct effect of reducing the amount of capital available for exploration and production in the state. The modification of the ELF embodied in SB-97 is an increase in taxes. This bill provides only a short term revenue boost to cover excessive current government spending. It will not solve the fiscal difficulties the state now faces, and if it is enacted, it will be at the expense of long-term stability and growth. Too much of the oil industry's resources are being drained out of resource development and into government. It is time for the Legislature to set the pace for Alaska by putting into place policies that attract new investment and provide incentives to increase current investments. The current ELF formula does help to provide incentives to increase production, while SB-97 severely limits those incentives and effectively reinstates the regressive inequities of the gross production tax.

In closing, I would like to state that ARCO Alaska believes that SB-97 will not be advantageous to the economy or the citizens of Alaska. Its enactment would place an onerous additional tax burden on the oil industry that would remove to other states or countries funds that could otherwise be spent on additional investment in Alaska. SB-97 would create a disincentive to future Alaska exploration and development and will not maximize the recovery of Alaska's oil resources. ARCO Alaska strongly opposes Senate Bill 97.

**ANS Net Revenue
Kuparuk River Field**

	Current Law \$/bbl	SB-97 \$/bbl
Assumed Crude Price	14.01	14.01
Tanker Freight	2.70	2.70
Quality Differential	0.40	0.40
TAPS Tariff	3.11	3.11
Kuparuk Pipeline	0.70	0.70
Pipeline Loss	0.10	0.10
Wellhead Price	7.00	7.00
Production Cost and Capital Recovery	5.43	5.43
Total Net Revenue	1.58	1.58
State Royalty	0.82	0.82
Severance Tax	0.54	0.75
Property Tax	0.44	0.44
State Income Tax	-0.01	-0.01
Total State	1.79	1.99
Federal Income Tax	-0.07	-0.14
Producer Profit	-0.14	-0.28

Source:

Barclays de Zoete Wedd, September 1988

Alaska Department of Revenue October 1988

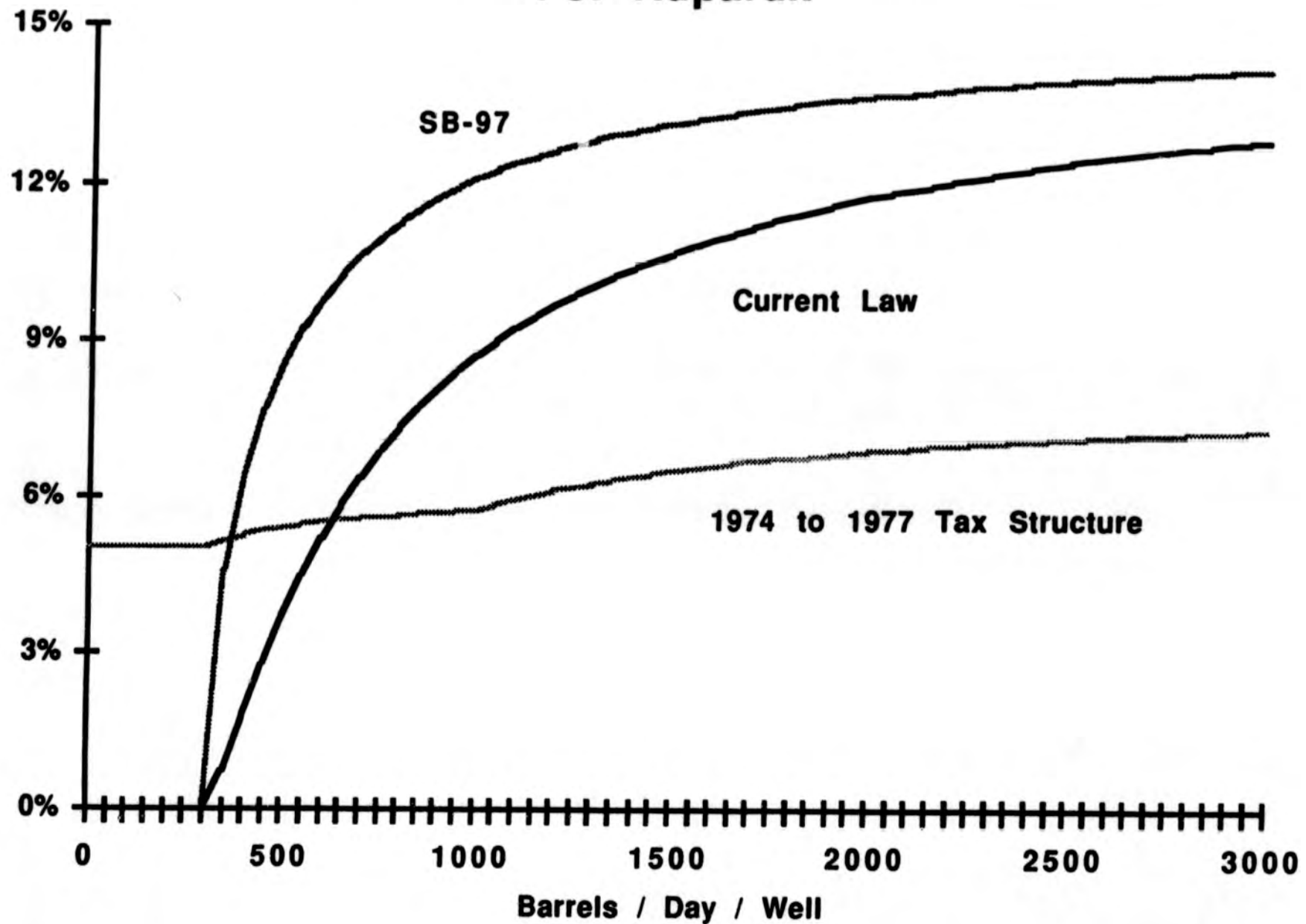
State of Alaska Royalty and Severance Methodology

PROJECT PORTFOLIO

KUPARUK

<u>Project</u>	<u>Description</u>	<u>Timing</u>
<u>Drilling</u>		
• Peripheral Drillsite 2K	Selective peripheral DS development on 160 acre spacing. Total of 98 additional wells	1989 SU
• Peripheral Drillsite 3R		1989 SU
• Peripheral Drillsite 2M		1990 SU
• Peripheral Drillsite 2L		1990 SU
• Peripheral Drillsite 3G		1990 SU
• Flem. Peripheral Dev.	14 drillsite expansions, 6 new drillsites, 180 additional wells 1 rig 1989, 2 rigs thereafter	1990===>
<u>Waterflood/EOR</u>		
• LIP-3 Expansion	Additional water handling capacity @ CPF-3 22 new wells. Improve EOR efficiency 16 wells. Seed for Phase I Infill 160 + 80 acre accelerate reserves 19 drillsites staged over 4 years	1990 SL
• Infill Drill @ DS 1Y/2Z		1989===>
• Infill Drill @ DS 1A		1989 SU
• Phase I Infill Drilling		1991 SU
• Fullfield EOR		1991 SU

Effective Severance Tax Rates For Kuparuk



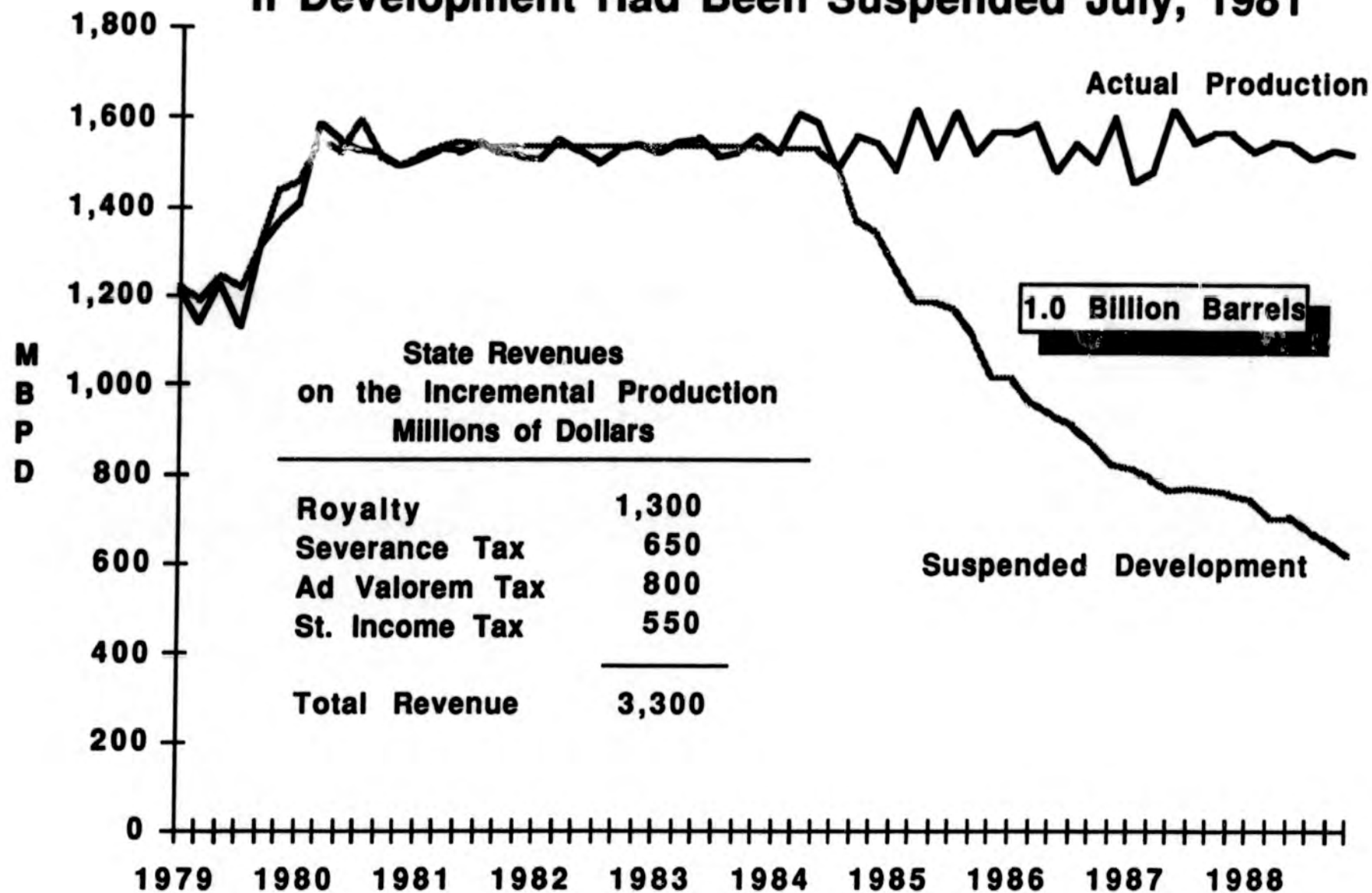
The Rest of the Story on the ARCO Drilling Example

	Without Royalty	Including Royalty	Royalty
Original Kuparuk bbl / Yr.	90,168,000	103,049,143	12,881,143
With New Well	90,277,000	103,173,714	12,896,714
Additional Royalty			15,571
x \$9.00 / bbl			\$140,143
+ Ad Valorem Tax			\$20,000
- ELF Impact			(\$37,846)
Total State Revenue Impact			\$122,297

ARCO Kuparuk Example

	<u>Current Law</u>	<u>Proposed Law</u>
Change in Annual Gross Revenue	\$981,000	\$981,000
Change in Annual Severance Tax	(\$37,846)	\$58,611
Tax Rate on Incremental Production	-3.9%	6.0%
Average Tax Rate Before Drilling	7.820%	10.944%
Average Tax Rate After Drilling	7.806%	10.938%
Percent Change in Average Tax Rate Due to Drilling	-0.180%	-0.055%

Prudhoe Bay Production **If Development Had Been Suspended July, 1981**



Prudhoe Bay

1981-1988 Industry Investment

		<u>\$ MM</u>
Additional Wells		2,550
Producing Wells	450	
Injection Wells	123	
Other Wells	23	
Waterflood		2,099
Production Facilities		1,475
Gas Handling		470
Enhanced Oil Recovery		620
Other		820
Total		\$8,040

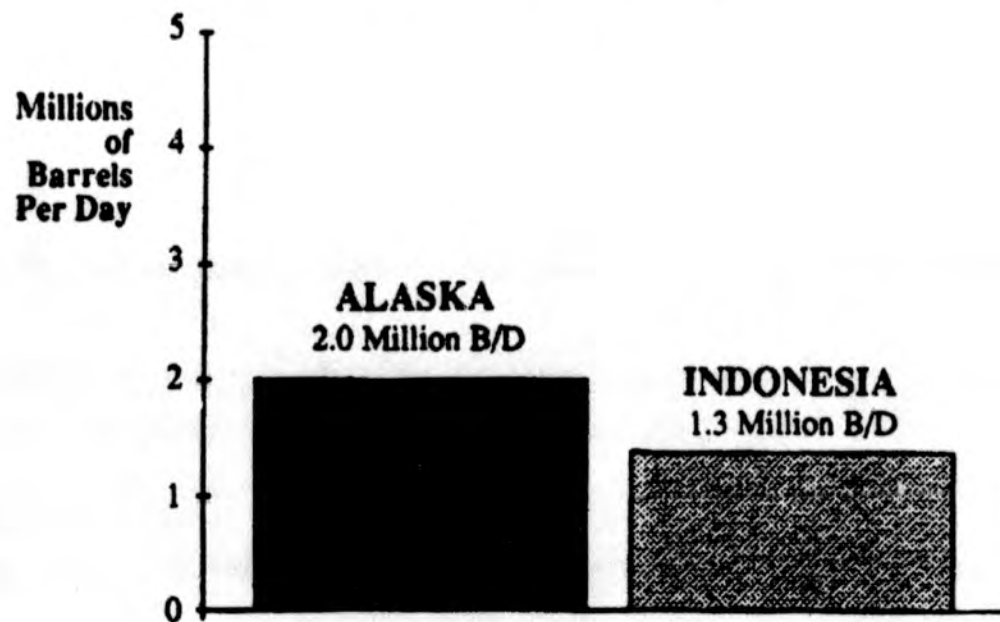
PETROLEUM INDUSTRY CAPITAL INVESTMENT IN ALASKA

\$ Billions
1960 through 1988

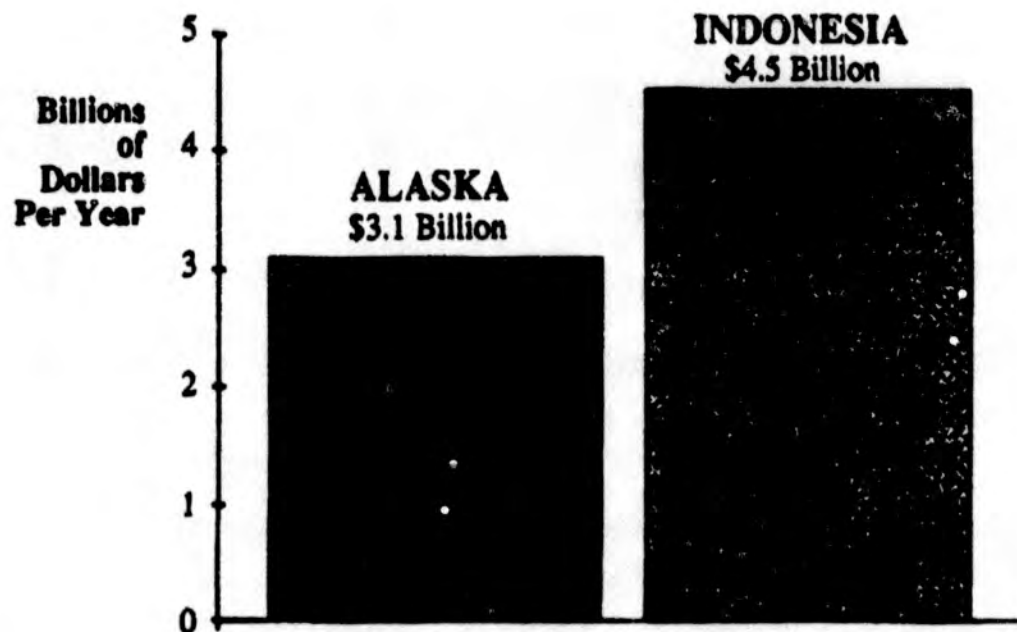
	<u>ARCO</u> <u>Investment</u>	<u>Industry</u> <u>Investment</u>
Prudhoe Bay	3.1	14.3
Kuparuk River	2.3	3.6
Lisburne	.4	1.0
Endicott		1.2
Milne Point		.3
Cook Inlet	.2	.7
Seal Island, Mukluk #1		.2
TAPS	2.0	9.3
Lease Purchases	.6	7.6
Exploratory Drilling	.5	3.6
Seismic/Other Exploration	.4	2.6
COST Wells		.5
Refineries		.4
Marketing/Distribution Assets		.1
Office Buildings/Other	<u>.1</u>	<u>.3</u>
TOTAL	<u>9.6</u>	<u>45.7</u>

PRODUCTION

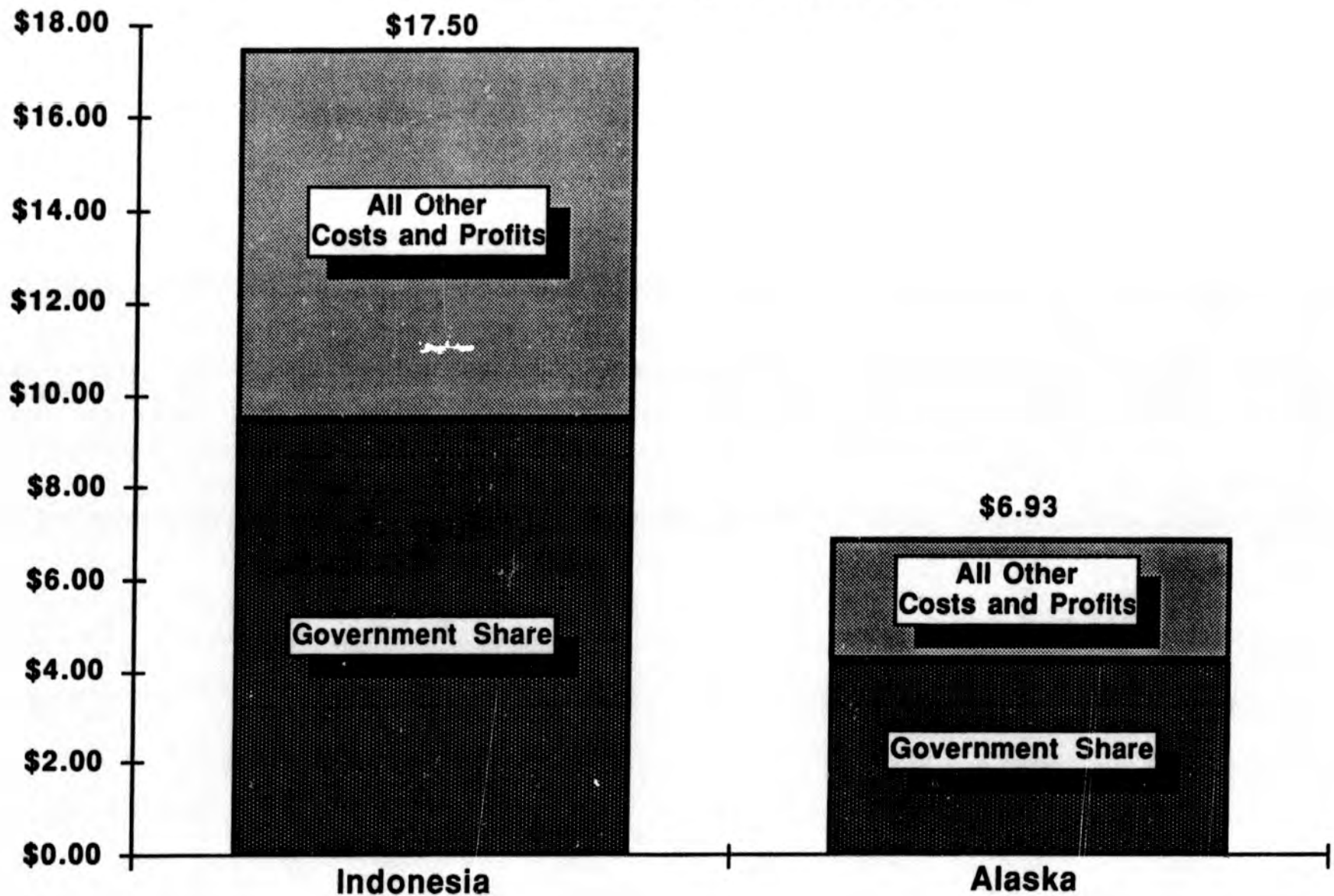
(Calendar Year 1987)



GOVERNMENT REVENUE



**Administration's Indonesia Comparison
On a Dollar per Barrel Basis**



Note: Refer to Administration's testimony; (\$3.1 Billion+2.0 MMBPD, compared to the ADOR wellhead value)

ARCO Alaska, Inc.

ARCO Alaska, Inc.

	1988	1987	1986
Earnings - millions of dollars	\$ 382	\$ 487	\$ 124
Total assets - millions of dollars	\$3,977	\$4,221	\$4,615
Additions to fixed assets - millions of dollars	\$ 214	\$ 136	\$ 506
Liquids production - thousand barrels/day - net	487.3	470.4	429.9
Natural gas sales - million cubic feet/day - net	30	28	35
Average crude price - dollars/barrel	\$ 8.51	\$10.95	\$ 6.43
Average natural gas price - dollars/thousand cubic feet	\$ 1.36	\$ 1.14	\$ 1.16
State taxes - millions of dollars*	\$ 474	\$ 328	\$ 483
Exploration expense - millions of dollars	\$ 56	\$ 45	\$ 44
Net exploratory wells completed	2	0	1
Proved liquids reserves - million barrels	2,064	2,136	2,046
Proved natural gas reserves - billion cubic feet	2,484	2,207	1,985

* Includes production, property and income taxes paid in the State of Alaska, as well as lump sum settlement payments made to the state in 1988 and 1986 for income and production taxes. Does not include the state's approximately 12.5 percent share of production.

During 1988, ARCO Alaska, Inc., achieved record liquids production from the North Slope of Alaska for the third consecutive year. The Company generated net income of \$382 million, despite a significant reduction in crude oil prices.

ARCO Alaska operates the eastern half of the Prudhoe Bay field, the largest oil field in North America, and is the sole operator of the Kuparuk and Lisburne fields. These assets represent the foundation of ARCO's integrated West Coast operations and are among ARCO's most valuable resources for the future.

ARCO Alaska took steps in 1988 to improve its longer term reserve position and production outlook by reactivating an exploration drilling program and working with other Prudhoe

Bay Unit Owners to relieve gas handling capacity constraints in the field. These efforts were very successful. In the exploration program, ARCO Alaska identified a new oil accumulation in the Point McIntyre area near Prudhoe Bay. To address the gas handling issue, the Owners agreed to initiate a gas handling expansion program that will boost Prudhoe Bay field recovery and production.

Prudhoe Bay

Total liquids production was about level with 1987. Gross condensate production increased to 80,000 barrels per day from 64,000 barrels per day in 1987. The Central Gas Facility produced 52,500 gross barrels of natural gas liquids per day compared with 41,000 barrels per day in 1987. Gross crude

Alaska — Major Field Statistics at December 31, 1988

	Prudhoe Bay	Kuparuk	Lisburne
1988 Liquids production* — thousand barrels/day	Gross 1,581	302	43
	Net 321	147	15
Cumulative liquids production — millions of barrels	Gross 6,066	508	38
	Net 1,184	250	13
Cumulative field investment — billions of dollars	Gross \$14.7	\$ 3.7	\$ 1.1
	Net \$ 3.2	\$ 2.3	\$.4
Producing oil wells	Gross 711	333	53
	Net 155	187	21
Remaining proved liquids reserves — millions of barrels	Net 1,398	578	64

* Includes crude oil, condensate and natural gas liquids.

oil production averaged 1.45 million barrels per day in 1988, versus 1.50 million barrels per day in 1987. The decrease in crude production was due to natural field decline, facility downtime and transportation-related delays. ARCO Alaska has a 21.78 percent working interest in the oil produced at the Prudhoe Bay field and a 42.56 percent working interest in the condensate produced.

The agreement to proceed with a gas handling expansion project was an important decision in 1988. As Prudhoe Bay continues to mature, increasing amounts of gas are produced with every barrel of oil. In order to optimize oil production and increase reserves, the operation needs to increase gas handling capacity. The project, known as GHX-1, is scheduled for startup in late 1990 and will expand the field's gas handling capacity from about 3.7 billion cubic feet per day to 5.1 billion cubic feet per day and boost field production by approximately 90,000 gross barrels per day. Ultimate recovery over the life of the field will increase by some 400 million gross barrels. The project has an estimated total cost of \$400 million, of which ARCO's share is approximately \$88 million.

Alaska Liquids Production thousand barrels/day net

■ Other Alaska
■ Lisburne
■ Kuparuk
■ Prudhoe Bay

Prudhoe Bay Unit Owners are already studying the feasibility of a second gas handling expansion project (GHX-2) which could further increase gas handling capacity to approximately 7.5 billion cubic feet per day.

In addition, a total of 57 new development wells were drilled at Prudhoe Bay in 1988, and major efforts continued to optimize well productivity.

Initial development is also under way in two peripheral parts of the field. Production

from the Eileen West End area began as planned in mid-1988 and exceeded 36,000 gross barrels per day by year end. Production from the Hurl State area is slated to start up in late 1989.

Kuparuk

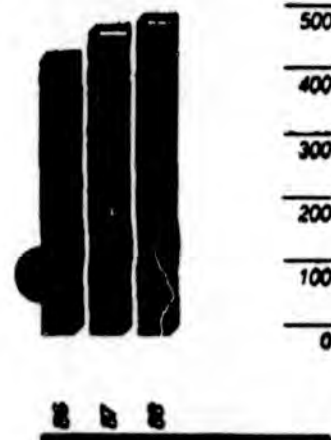
ARCO Alaska has a 56.3 percent working interest in the Kuparuk River field, located 30 miles west of Prudhoe Bay. Kuparuk averaged record crude oil production of 302,000 gross barrels per day in 1988, a 7 percent increase over 1987. ARCO's net production rose by about 18 percent over 1987, partially due to the production payback of 14,000 barrels a day from the Company to other Kuparuk owners which came to an end in the first quarter of 1988.

Some of the major operational factors contributing to the record production were the startup of a clarifier unit at the Seawater Treatment Plant, the drilling of an additional 36 development wells, the initiation of the third phase of immiscible water-alternating-gas injection and 47 well stimulations. Additional drilling at Kuparuk is expected to result in even higher crude oil production in 1989.

Waterflooding, a secondary recovery method, has been in full-field operation at Kuparuk since 1983. In 1988, the Company initiated another step in improving recovery from the Kuparuk field. This involves a small scale enhanced oil recovery project using miscible gas injectant. This process is already in use at Prudhoe Bay. It is envisioned that this enhanced recovery method could ultimately be expanded fieldwide at Kuparuk, enabling production to continue at or above current levels through the early to mid-1990s.

Lisburne

ARCO Alaska has a 40 percent working interest in Lisburne a complex carbonate reservoir underlying the Prudhoe Bay field. Gross liquids production from Lisburne was slightly below 1987 levels, due to expected declines in well productivity. The current outlook is for near-term production to remain at about 40,000 to 50,000 barrels per day.



Exploration

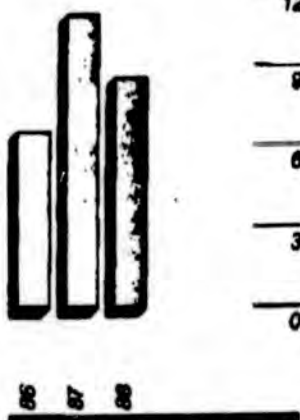
During 1988, ARCO Alaska completed two exploratory wells (one on the North Slope and one in the Cook Inlet) and participated in five major lease sales.

Another exploration well was drilled just outside the Prudhoe Bay participating area in the Point McIntyre area. Preliminary results of this well indicate the presence of a new oil accumulation. In order to evaluate the potential of this accumulation, three additional wells and a three-dimensional seismic program are planned in 1989.

In the lease sales, ARCO Alaska acquired more than 480,000 net exploratory acres at an average cost of about \$43 per acre. Of particular interest is acreage acquired in the Chukchi Sea, a large, high-risk, high-potential area located in the Arctic offshore. The Company is in the initial stages of a long-term exploration plan for this area and is preparing for a follow-up sale in 1991.

The Coastal Plain of the Arctic National Wildlife Refuge (ANWR) remained a focal point for ARCO Alaska in 1988. Congress is continuing to consider legislation that would allow oil and gas exploration and development in the ANWR Coastal Plain, which ARCO and others believe to be a very high-potential area for a significant discovery. ARCO Alaska will have an important strategic position in ANWR development if options which the Company previously negotiated with two Alaska Native Corporations are approved by Congress. During 1988, ARCO Alaska acquired several key tracts in shallow marine waters to the north and east of ANWR through state and federal lease sales. The Company participated in one well drilled in federal waters near ANWR in 1988 and is supporting another well that is currently being drilled.

Average Sales Price — Alaska Crude and Condensate
dollars/barrel



Reserves

In 1988, ARCO Alaska added proved liquids reserves totaling 106 million barrels, which only partially replaced production of 178 million barrels. Reserve additions came primarily from revisions associated with the ongoing development of Prudhoe Bay and Kuparuk. Gas reserve additions of 355 billion cubic feet were associated with projected fuel requirements for North Slope operations.

The startup of a small-scale enhanced recovery project in 1988 has important implications for the future production profile of the Kuparuk River field. Key figures in the project were (left to right) ARCO Alaska Engineers Mike Ingraham, Tuan Ma and Janet Weiss.

West Sak

ARCO Alaska is continuing to move toward development of the West Sak reservoir, a large accumulation of relatively viscous oil overlying the Kuparuk River field. Although the area is not expected to be developed before the mid-1990s, the Company plans to initiate a small scale waterflood and an enhanced oil recovery pilot

project at West Sak in the early 1990s. The study of advanced technology in well completions and reservoir recovery processes is continuing and a test well will be drilled in 1989.

Cook Inlet

ARCO Alaska's 1988 net production from Cook Inlet amounted to 20 million cubic feet of natural gas and 4,800 barrels of oil per day. Production in 1989 is expected to be level with these results. The Company sold its 33 percent working interest in the Middle Ground Shoals field during 1988.

A year-by-year comparison of TAPS profit is shown in Table 9.

Table 9
Annual TAPS Profit
(millions of dollars)

1983 through 1987:

	1987	1986	1985	1984	1983
Revenue	\$2,765	\$3,080	\$3,578	\$3,926	\$3,899
Expenses:					
Depreciation	299	310	309	431	475
Operating and Administrative	255	343	247	387	483
Interest	150	440	411	570	579
Property Taxes	147	164	168	171	165
State Income Taxes	57	55	73	71	66
Federal Income Taxes	<u>631</u>	<u>0</u>	<u>984</u>	<u>610</u>	<u>674</u>
Profit	<u>\$1,226</u>	<u>\$1,768</u>	<u>\$1,386</u>	<u>\$1,686</u>	<u>\$1,457</u>
Profit per barrel:	<u>\$2.08</u>	<u>\$3.07</u>	<u>\$2.44</u>	<u>\$3.17</u>	<u>\$2.77</u>
MMBL	716,662	665,435	649,887		
\$/bbl	1.71	2.66	2.13		

1978 to 1982:

	1982	1981	1980	1979	1978
Revenue	\$3,896	\$3,605	\$3,554	\$2,963	\$2,394
Expenses:					
Depreciation	467	431	503	421	355
Operating and Administrative	498	474	435	330	381
Interest	648	681	720	771	846
Property Taxes	168	171	168	174	174
State Income Taxes	63	203	162	119	60
Federal Income Taxes	<u>802</u>	<u>599</u>	<u>617</u>	<u>129</u>	<u>8</u>
Profit	<u>\$1,250</u>	<u>\$1,046</u>	<u>\$ 949</u>	<u>\$1,019</u>	<u>\$ 570</u>
Profit per barrel:	<u>\$2.42</u>	<u>\$2.15</u>	<u>\$1.95</u>	<u>\$2.49</u>	<u>\$1.64</u>

ADDITIONAL BENEFITS OF ANS OIL

ANS producers receive profits from Alaska oil outside of Alaska which provides an additional bonus beyond what it would cost if they had to purchase imported oil. An additional profit of approximately \$0.7 billion went to the producers through the operation of the U.S. Department of Energy crude oil entitlements program. Producers are believed to earn additional profit through the refining of ANS crude because, among other things, they have access to a secure source of crude oil. If they did not have the ANS crude, it would be necessary for them to acquire crude from foreign sources.

Others estimate that profits on tanker operations and trans-Panama shipment activities added between \$.25 and \$1.00 profit per barrel of ANS crude produced. These additional profits would have been received on the nearly 6 billion barrels of ANS production. These added profits are not included in the \$42.6 billion of total oil industry profit in Alaska covered in this report.

INVESTMENTS MADE ON THE ALASKA NORTH SLOPE

Figure 9 shows the relative amounts of money invested in projects to produce ANS crude. The greatest investment was \$9.4 billion in TAPS. The total investment to date in Prudhoe Bay was \$8.7 billion. This includes the waterflood project and the miscible gas injection project as well as infield drilling. The investment in Kuparuk was \$4.3 billion which includes amounts for the newly installed waterflood project that had not been in operation during the period of this study. Milne Point cost \$575 million. Endicott and Lisburne each cost approximately one billion dollars. As of the end of 1987, Milne Point had been shut in, while Endicott and Lisburne had just begun operations too recently to have a significant impact on the revenue numbers reported here. The investments made in Cook Inlet during this period were not significant relative to the ANS investments during this period.

Figure 9
ANS Investments
(billions of dollars)

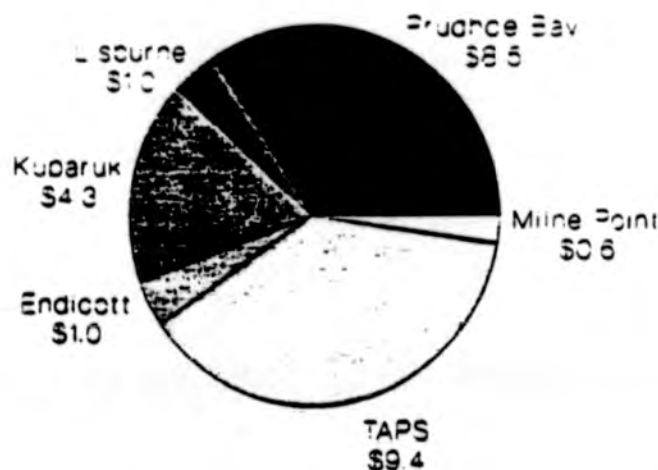


Table 10 shows the timing of the investments in Prudhoe Bay and other ANS projects together with an estimate of the timing of the investment in TAPS. These investment timings are based on information from the producers and may not be exact.

Table 10
ANS Investments
(millions of dollars)

Year	Project	Amount
1987	Prudhoe gas	\$ 720
1987	Kuparuk waterflood	900
1987	Endicott	1,000
1986	Lisburne	1,000
1985	Prudhoe gas plant	720
1984	Milne Point	570
1983	Prudhoe waterflood	2,000
1981	Kuparuk	3,400
1981	Prudhoe drilling	1,100
1980	Prudhoe drilling	250
1979	Prudhoe drilling	250
1977	Prudhoe*	1,850
1977	TAPS*	4,700
1976	Prudhoe*	1,850
1976	TAPS*	4,700
Total		\$ 25,015

1960 - 1988

45.7

*These amounts were spent over the period 1969 through 1977, with the majority of the funds spent later in the construction phase of the project.

ECONOMIC LIMIT FACTOR

G. N. NELSON TESTIMONY

Madam Chairman and Members of the Committee:

For the record, my name is George N. Nelson, and I am President of BP Exploration (Alaska) Inc.

In 1986, you knew us as Sohio Alaska Petroleum Company.

In 1987 and 88, you knew us as Standard Alaska Production Company.

And now in 1989, we are the same company with a new name. Now we're known as BP Exploration and I hope this will be the last name change, as I am sure you will agree. This is not what we think of as stability!

With me today is Tom Williams. Most of you already know him. I consider Tom to be the most knowledgeable person in the state on the subject of the ELF; he fathered it when he was Director of Petroleum Revenue.

You may be wondering why I'm here testifying when he knows more about the history of ELF and the formula. It's because this bill is about producing oil, and that's been my job for the past 30 years.

I started in the oil business in Venezuela in 1955. Back then, Venezuela was viewed a lot like Saudi Arabia is today -- its reserves seemed unlimited. But then a funny thing happened in 1957. The government increased taxes on the oil business retroactively to the tune of \$380 million. And there hasn't been another major oil field discovery since then.

I, like most others, moved on shortly after Venezuela's tax policy changed. I went to Libya, where I stayed from 1967 through 1975. Libya also has taken a high-tax, high-government-control approach. As a result, Libya's production hasn't met its potential, either.

Since 1975, I've worked on the Prudhoe Bay field. Our company has a 50% interest in Prudhoe, a 38% interest in Kuparuk, a 56% interest in Endicott and a 20% interest in Lisburne.

I mention this background because I think we can learn from the past. But we can't *live* in the past, and it appears to me after looking over the testimony in the House version of the most recent ELF bill that there's a dangerous emphasis on the past with no look to the future. Tom can answer your questions about what happened with ELF between 1977 and 1981, but I want to talk about the future.

How important are giant oil fields like Prudhoe Bay, and how much tax and royalty should they pay? Without Prudhoe, there would have been no \$10 billion investment in the Trans Alaska Pipeline. There would be no Kuparuk. No Endicott. No Lisburne.

Without a large, commercial field in ANWR, there will be no pipeline from ANWR to TAPS. Without the potential for a large commercial find in ANWR, there would be no incentive to spend hundreds of millions of dollars to explore there.

Over the next decade, the vast majority of the new oil reserves on the North Slope should come from Prudhoe Bay and Kuparuk. *Should* come from from Prudhoe Bay and Kuparuk. But it will only happen if there's a commercial incentive to fully develop these two giant oil fields.

Senate Bill 97 would accomplish exactly the opposite. We would pay a lower tax rate on Prudhoe production of 1.4 million barrels a day than on 1.5 million barrels a day. The bill is written to reward *less* production from large and small fields alike. The message: Don't invest money to boost recovery. Lower production will be rewarded with lower tax rates.

Is this really what you intended? I don't think so.

Prudhoe and Kuparuk have been characterized as extremely profitable oil fields that can -- and should -- pay as much tax now as they did when prices were twice what they are now. During the first half of the '80s, they *were* highly profitable. *And Alaska shared fully in that profit.* Between 1980 and 1986, the state collected nearly \$25 billion in taxes and royalties. That's more than \$7,000 per resident per year. Put another way, an Alaskan family of four had some \$200,000 in taxes and royalties paid on their behalf by the oil industry during this period.

But the heyday is over, and I, for one, don't think the state *or* the industry will see times like those again, at least not in this century.

Since 1986, our North Slope operations have been far less profitable. Based on our own experience, the oil industry's return on North Slope investment between 1986 and 1988 averaged about 10% a year. Compare that to the Alaska Permanent Fund, which, pursuing a conservative investment policy of avoiding risks, has generated a 12% average annual return over the same period.

During this three-year period, we've reported some \$540 million a year in after-tax profits from North Slope production. During the same period, we paid the State of Alaska and its municipalities some \$750 million a year in taxes and royalties on North Slope production. During the same period, we've reinvested 80% of our production profits in North Slope exploration and development -- an average of more than \$430 million a year.

When the state's oil and gas tax legislation was last overhauled in 1981, there was a consensus between the legislative leadership and the administration that the state's "fair share" of the oil wealth should never fall below 30%. This corresponded with roughly a third for the state, a third for the industry and a third for the federal government.

According to studies by the Alaska Department of Revenue, the state's share was always more than 30% between 1981 and June of 1987. We know, and administration statements confirm, that the state share is still above 30%.

Based on the state's current official price forecast of \$7.36 (wellhead value) for FY'89, the state is receiving almost *half* -- 49% -- of the wellhead value of oil after lifting costs and depreciation are taken out. The industry's share is roughly a third -- 34%. Even using the administration's numbers, which are based on a value at Valdez and include pipeline tariffs, the state's share is 36%.

Plenty of things besides oil prices have a significant impact on the profitability of Prudhoe and Kuparuk. Two of the most important are costs and the level of production.

Prudhoe has been producing oil for nearly 12 years now, and Kuparuk's been producing for more than seven. As you know, the North Slope has one of the harshest climates in the world. Because maintenance costs were higher than anticipated, our expenses surpassed our budget by some \$40 million last year alone. Now that our Prudhoe Bay facilities are operating at capacity, we can no longer make up for production lost due to maintenance, weather conditions or complications with tanker shipments. That means we're spreading higher costs over fewer barrels. Costs will continue to rise, and production will continue to decline.

So what exactly does this have to do with ELF? ELF takes into account the fact that oil production doesn't become marginal overnight. It's a gradual process, and that's how the ELF responds.

Prudhoe Bay currently pays about a 12% production tax. That's a very high rate -- far higher than the 4.9% rate in Texas and 7.1% in Oklahoma, but it's 3% lower than it was. Prudhoe was subject to the 10-year rounding rule until June of 1987. ELF links the payment of taxes to the ability to pay them, and that's good tax policy.

The ELF also contains an incentive to drill new wells and to maximize recovery from existing ones. This incentive will play a key role in slowing the decline in production at Prudhoe Bay and Kuparuk.

It's also creating private-sector jobs for Alaskans and millions of dollars in revenues for Alaskan contractors. Consider the example of our Hurl State development -- a small, marginal development within the huge Prudhoe Bay field.

Hurl State represents an investment of some \$80 million, and it will boost recovery at Prudhoe by 37 million barrels. That's 37 million barrels more for the state to tax and collect royalties.

Just as important, it means jobs for Alaskans. In all, Hurl State will create some 300 construction jobs over a two-year period. And we've already demonstrated our commitment to use Alaskan contractors to perform the work. We recently awarded some \$12 million in contracts to Alaskan firms to perform a portion of the work on Hurl State.

Union *and* non-union firms.

Anchorage *and* Fairbanks.

And there's more work to come -- drilling, installation and other projects.

We've also recently awarded a \$5 million contract to Doyon Drilling, a Native corporation joint venture, to design, build and operate a workover rig at Prudhoe Bay. Workover rigs are used to perform remedial work on older wells to increase recovery. Native firms play an important role in our development activities and in our day-to-day operations -- from catering to drilling, from materials handling to maintenance.

Senate Bill 97 would discourage projects like Hurl State and workovers. It encourages us not to drill. It encourages us not to maximize production. Under certain circumstances, adding production for new wells would increase taxes on all other production. Again, I do not believe that was your intention.

Over in the House, a lot of debate has centered on what the bill would do for small, marginal fields. Smaller North Slope fields should not be ignored, but there is no reason incentives for small fields have to be linked to major tax increases on large fields.

Our experience with Niakuk and Endicott -- two fields that would qualify as "small" and "marginal" under terms of Senate Bill 97 -- has been that permitting can be the biggest hurdle to development.

And I can't overemphasize the fact that the current ELF provides adequate relief from the high normal rate for small fields like Milne Point. Because of the current ELF, Milne Point paid no production tax for several months prior to its shutdown. NO production tax. I can't think of a bigger production tax incentive than paying no taxes at all.

What Milne Point did continue to pay was an effective royalty in excess of 18%. Senate Bill 97 doesn't provide any royalty relief.

Changes proposed in the ELF are not really designed to encourage development and production at small fields. They're intended to raise revenues to support state government spending.

And why does state government spending require so much support in Alaska? For one thing, the number of state employees is growing -- by 1,312 between November 1987 and November 1988, according to the administration's own numbers. And the state budget continues to grow.

Changing the ELF will harm the industry, and it will harm the state. It could force the industry to defer expenditures and investments. It would send a clear message to all potential private investors that this state is determined to tax at any rate necessary to maintain spending at 4-1/2 times the national per capita average.

We currently plan to spend \$2 billion to \$2.5 billion on North Slope development over the next five years. This five-year spending plan is expected to add 750 million barrels for BP alone to produce. And twice as much for the state to tax and collect royalty.

This committee, I'm sure, understands that most of our projects are close to the margin already. Cost increases could force us to forego some of them -- such as Hurl State.

Changing the ELF will also reinforce the industry's fears that every time the State of Alaska has a budget problem, we're going to get the bill for it.

\$30 oil is a thing of the past. It ended years ago. It's 1989 now, and we've got lower prices and higher costs. Soon we'll have less production as well.

But we've also got something else: a broader and stronger support industry, as our current minimodule fabrication and pipe insulation contract work in Fairbanks attests to.

There are many factors influence our decisions on whether to go forward with development projects.

We can't control the price of oil.

We can't control inflation.

We can't stop facilities from aging, and we can't stop reservoirs from declining.

But we *can* try to convince you not to increase our costs by imposing a new tax burden by changing the ELF formula, and that's why we're here. The ELF encourages development -- the kind that helps Alaska build a strong private sector to fuel its future.

TESTIMONY OF

D. E. CORNETT

FOR

EXXON COMPANY, U.S.A.

BEFORE THE

SENATE SPECIAL OIL AND GAS COMMITTEE

SB No. 97

MARCH 17, 1989

MY NAME IS DON CORNETT AND I AM ALASKA COORDINATOR FOR EXXON COMPANY, U.S.A. EXXON IS A WORKING INTEREST OWNER IN THE PRUDHOE BAY, KUPARUK, LISBURNE, AND ENDICOTT FIELDS. WE APPRECIATE THE OPPORTUNITY TO PRESENT OUR VIEWS ON SB 97 THIS MORNING.

SB 97 WOULD CAUSE A MAJOR CHANGE IN LONG-STANDING OIL PRODUCTION TAX POLICY IN ALASKA THAT COULD SERIOUSLY IMPACT CONTINUED DEVELOPMENT OF THE TWO LARGEST OIL FIELDS IN THE UNITED STATES, WITHOUT ADDING ANY MEANINGFUL OFFSETTING BENEFIT TO DEVELOPMENT OF OTHER SMALLER FIELDS IN ALASKA. IT WOULD DO THIS BY REVISING THE ECONOMIC LIMIT FACTOR ("ELF"), WHICH DETERMINES THE EFFECTIVE PRODUCTION TAX RATE, CHANGING THE CALCULATION FROM A WELL PRODUCTION RATE BASIS TO A FIELD PRODUCTION RATE BASIS. THIS WOULD RESULT IN IMMEDIATE INCREASES IN TAX RATE OF MORE THAN 20% AT PRUDHOE BAY AND ABOUT 40% AT KUPARUK. SB 97 DOES NOT CLOSE A "TAX LOOPHOLE"; IT DOES NOT CORRECT A "TAX GIVEAWAY". IT IS AN INCREASE IN THE PRODUCTION TAX RATE FOR MORE THAN 90% OF ALASKA'S OIL PRODUCTION. IT EFFECTIVELY ELIMINATES THE BENEFIT OF ELF, A PROVISION OF THE PRODUCTION TAX LAW THAT WAS DESIGNED BY A PREVIOUS LEGISLATURE TO REDUCE THE PRODUCTION TAX BURDEN ON A FIELD AS IT MATURES AND THE AVERAGE WELL RATE DROPS, A PROVISION THAT HAS BEEN AN ESSENTIAL PART OF ALASKA'S PRODUCTION TAX POLICY SINCE 1977.

LET'S LOOK AT THE HISTORY OF ELF. ELF WAS FIRST ADOPTED IN A MAJOR REVISION OF ALASKA'S PRODUCTION TAX LAWS IN 1977, AT THE TIME WHEN PRUDHOE BAY PRODUCTION BEGAN. PRIOR TO THAT TIME, THE MAXIMUM OIL TAX RATE WAS 8%. THE 1977 CHANGE IN THE LAW SIGNIFICANTLY INCREASED THE BASIC RATE TO 12.25%, BUT ALSO INCORPORATED THE ELF IN RECOGNITION THAT THE BASIC RATE SHOULD BE SCALED DOWN IN APPROPRIATE CASES. ELF RESULTED IN AN EFFECTIVE OIL TAX RATE FOR THE PRUDHOE BAY FIELD OF APPROXIMATELY 11.3% AS OF JUNE 1981.

IN JULY 1981, THE BASIC RATE WAS AGAIN INCREASED, FROM 12.25% TO 15%, AND THE ELF FACTOR WAS FIXED AT 1.0 FOR THE FIRST TEN YEARS OF PRODUCTION FROM THE PRUDHOE BAY FIELD. THIS SUSPENDED THE APPLICATION OF THE ELF FACTOR AT PRUDHOE BAY FOR SIX YEARS UNTIL THE SUMMER OF 1987, TEN YEARS AFTER PRUDHOE BAY PRODUCTION BEGAN. DURING THAT WHOLE TIME WE PAID PRODUCTION TAX AT A 15% RATE -- THE HIGHEST IN THE NATION. IN THE CASE OF THE PRUDHOE BAY FIELD TODAY, THE ELF FACTOR REDUCES THE BASIC TAX RATE OF 15% TO APPROXIMATELY 12.3%.

IN 1988, AVERAGE DAILY OIL PRODUCTION AT PRUDHOE BAY DECLINED TO 1.45MB FROM THE 1.50MB AVERAGE ACHIEVED IN PRIOR YEARS, AND WE ANTICIPATE THAT THIS DECLINE WILL CONTINUE. THIS IS A NORMAL PHYSICAL OCCURRENCE FOR AN

OIL FIELD, WHICH IS A DEPLETING NON-RENEWABLE DEPOSIT OF PETROLEUM. THE FACT OF DECLINE WAS INEVITABLE; THE OCCURRENCE, HOWEVER, WAS DELAYED SIGNIFICANTLY BY AN EFFICIENT AND OPTIMAL DEVELOPMENT PLAN IMPLEMENTED BY THE OWNERS. THAT DEVELOPMENT PLAN CONTINUES TO BE IMPLEMENTED AT PRUDHOE BAY TODAY, WITH FURTHER DEVELOPMENT DRILLING, EXPANDED GAS HANDLING FACILITIES, AND EXPANSION OF ENHANCED OIL RECOVERY ON THE DRAWING BOARD. THESE INVESTMENTS WILL INCREASE RECOVERABLE RESERVES AT PRUDHOE BAY AND WILL MAINTAIN HIGHER LEVELS OF PRODUCTION. THE TYPES OF PROJECTS THAT CONTRIBUTE TO THIS EFFORT ARE BOUNDED ONLY BY TECHNOLOGICAL INNOVATION AND ECONOMIC FEASIBILITY.

MANY FUTURE PROJECTS TO MAINTAIN PRODUCTION AND INCREASE RECOVERABLE RESERVES AT PRUDHOE BAY ARE MARGINAL INVESTMENTS, SIMILAR TO THE PROJECTS TO DEVELOP SMALLER FIELDS ON THE NORTH SLOPE. WHILE SB 97 MIGHT LOWER THE PRODUCTION TAX FOR SOME SMALLER FIELDS, IT WOULD DISCOURAGE MARGINAL PROJECTS AT PRUDHOE BAY. SUCH A TAX POLICY IS HARD TO UNDERSTAND, SINCE IT IS CONCEIVABLE THAT THE UNDEVELOPED MARGINAL RESERVES AT PRUDHOE BAY MIGHT EXCEED THE POTENTIAL RESERVES OF ALL THE SMALLER FIELD PROSPECTS IDENTIFIED TO DATE. THE RESULT WOULD BE LESS TOTAL OIL RECOVERY FROM PRUDHOE BAY AND CONSEQUENTLY LESS ROYALTY AND PRODUCTION TAXES FOR THE

STATE OF ALASKA AND FEWER JOBS FOR ALASKANS. THE ALASKA PERMANENT FUND WOULD SUFFER FROM THE LOWER ROYALTY PAYMENTS.

SINCE THE INITIAL DEVELOPMENT, EXXON HAS EVALUATED AND SUPPORTED SEVERAL PROJECTS TO INCREASE RECOVERY AT PRUDHOE BAY. THESE PROJECTS HAVE INCLUDED WELLS ON CLOSER SPACING, ENLARGEMENT OF FLUID HANDLING FACILITIES, ARTIFICIAL LIFT, AND WATER INJECTION. THE COST PER BARREL FOR THESE PROJECTS TO INCREASE RECOVERY WAS TWICE THE COST OF THE INITIAL DEVELOPMENT.

THIS TREND TOWARD LESS PROFITABLE PROJECTS WILL CONTINUE. FUTURE PROJECTS WHICH ARE BEING PLANNED INCLUDE WELLS ON EVEN CLOSER SPACING AND IN THINNER OIL COLUMNS, ADDITIONAL ENHANCED OIL RECOVERY, DEVELOPMENT OF SMALLER RESERVOIRS, AND NEW IDEAS SUCH AS HORIZONTAL DRILLING. THE COST PER BARREL FOR THESE PROJECTS WILL BE MORE THAN FIVE TIMES AS MUCH AS THE INITIAL DEVELOPMENT. IN THE FUTURE, OTHER MARGINAL PROJECTS WILL BE DEFINED AS RESEARCH CONTINUES.

JUST HOW MANY OF THESE MARGINAL PROJECTS WILL BE JUSTIFIED AT PRUDHOE BAY? HOW MANY OF THE MORE THAN 10 BILLION BARRELS TO BE LEFT AFTER CURRENT DEVELOPMENT IS COMPLETED CAN BE RECOVERED? NO ONE KNOWS FOR CERTAIN

BECAUSE THE ECONOMICS ARE MARGINAL AND A NUMBER OF FACTORS WILL HAVE AN IMPACT ON THE LIMIT TO WHICH SUCH PROJECTS CAN BE JUSTIFIED.

BUT ONE THING IS CERTAIN, SB 97 WOULD PLACE FUTURE MARGINAL PROJECTS AT PRUDHOE BAY IN JEOPARDY. THE PRODUCTION TAX INCREASE PROPOSED BY SB 97 SIGNIFICANTLY REDUCES THE INCENTIVE TO PRODUCE THESE MARGINAL BARRELS.

IT IS AN ECONOMIC FACT OF LIFE THAT COMPANIES LIKE EXXON ENDEAVOR TO COMMIT THEIR CAPITAL AND RESOURCES ONLY TO PRUDENT INVESTMENTS THAT PROVIDE THEIR SHAREHOLDERS WITH A REASONABLE RETURN. THEY ARE MOST SELECTIVE IN THIS PROCESS. TWO DECADES AGO THE QUALITY OF NORTH SLOPE INVESTMENT OPPORTUNITIES CAUSED EXXON TO COMMIT BILLIONS OF DOLLARS IN THE INITIAL DEVELOPMENT OF PRUDHOE BAY AND CONSTRUCTION OF TAPS. AS A RESULT, PETROLEUM DEVELOPMENT IN ALASKA HAS ACCOUNTED FOR ABOUT 85% OF STATE REVENUES DURING THE PAST 12 YEARS AND IN ADDITION HAS ESTABLISHED THE NEARLY \$10 BILLION ALASKA PERMANENT FUND.

MAJOR DEVELOPMENT PROJECTS AT PRUDHOE BAY REQUIRE THE APPROVAL OF ALL THREE OF THE MAJOR OWNERS. EACH OF THE PRUDHOE BAY OWNERS EVALUATES THE ECONOMICS OF A NEW PROPOSED INVESTMENT BASED ON THE NEEDS OF ITS COMPANY, UNDER CRITERIA ESTABLISHED BY ITS MANAGEMENT. EXXON IS NOT PRIVY TO THE

DECISION-MAKING PROCESS AT AKCU OR BP, SINCE OUR COMPANIES ARE IN KEEN COMPETITION, AND I CANNOT COMMENT ON THEIR PROCEDURES. I CAN HOWEVER TELL YOU SOMETHING ABOUT HOW EXXON EVALUATES FUTURE DEVELOPMENT PROJECTS AT PRUDHOE BAY. THIS PROCESS INCLUDES THE EVALUATION OF VARIOUS TYPES OF RISK - GEOLOGIC RISK, RESERVOIR RISK, DRILLING RISK, AND POLITICAL/ECONOMIC RISK INCLUDING CRUDE OIL PRICES AND TAXES. THE INTRODUCTION OF SB 97 ADDS TO THE OVERALL RISK BY AFFECTING OUR PERCEPTION OF FUTURE TAX STABILITY IN ALASKA. UNDER SB 97, THE EFFECTIVE PRODUCTION TAX RATE AT PRUDHOE BAY DURING THE MID-1990'S IS PROJECTED TO BE ABOUT DOUBLE THAT UNDER CURRENT LAW.

EXXON OBVIOUSLY HAS GREAT INTEREST IN OPTIMIZING RECOVERY OF OIL AT PRUDHOE BAY IN VIEW OF THE ENORMOUS INVESTMENTS IT HAS MADE TO DATE. HOWEVER, FUTURE DEVELOPMENT PROJECTS MUST STAND ON THEIR OWN FEET AND THE METHODOLOGY FOR EVALUATING THE QUALITY OF THESE PROJECTS TODAY IS THE SAME AS THAT APPLIED AT THE TIME THE INITIAL INVESTMENT WAS MADE. THEY ARE EVALUATED PRIMARILY ON THE BASIS OF RETURN ON THE FUNDS INVESTED. WE DO A DISCOUNTED CASH FLOW ANALYSIS WHICH OFFSETS ALL PROJECT EXPENDITURES REQUIRED AGAINST ADDITIONAL REVENUES PROJECTED, BASED ON THE ADDITIONAL OIL RECOVERY OUR ENGINEERS PREDICT AND THE PRICE WE ANTICIPATE THAT OIL

WILL BRING IN THE MARKET WHEN PRODUCED. IF THE ECONOMICS ARE ATTRACTIVE,
THE PROJECT WILL BE APPROVED; IF NOT, THE PROJECT WILL LIKELY NOT PROCEED.

THERE ARE TWO ELEMENTS OF THIS FORMULA OVER WHICH EXXON HAS LITTLE CONTROL - CRUDE OIL PRICE FORECAST AND ALASKA TAXATION. WITH RESPECT TO CRUDE OIL PRICES, WE TRY TO FORECAST AS ACCURATELY AS POSSIBLE BASED ON ECONOMIC, POLITICAL, AND GEOLOGICAL INTELLIGENCE FROM AROUND THE WORLD. THIS HAS BEEN A LESS THAN PRECISE SCIENCE IN RECENT YEARS. THE VAGARIES OF THE WORLD PETROLEUM MARKETS ARE SURELY ONE OF THE REASONS WE ARE HERE TODAY TALKING ABOUT THIS PRODUCTION TAX INCREASE. WITH RESPECT TO ALASKA TAXATION, WE ASSUME A STABLE TAX POLICY BASED ON FAIRNESS AND UNIFORM ADMINISTRATION.

STATE TAX LIABILITY IS A CRITICAL FACTOR IN APPLYING THE ECONOMIC EVALUATION FORMULA I HAVE DESCRIBED. PRODUCTION TAXES ARE ESPECIALLY SIGNIFICANT SINCE THEY ARE BASED ON GROSS VALUE OF OIL PRODUCED IRRESPECTIVE OF THE PROFITABILITY OF THE PRODUCER. SB 97 SEEMS TO BE BASED ON THE PREMISE THAT PRODUCTION TAXES ARE, IN EFFECT, TAXES ON THE OIL FIELD, NOT ON THE OIL COMPANY, AND THAT LARGER OIL FIELDS SHOULD CONTRIBUTE AT A HIGHER RATE THAN SMALLER FIELDS. BUT, AS YOU KNOW OIL FIELDS DON'T PAY TAXES; OIL COMPANIES PAY TAXES. OIL COMPANIES, LIKE ALL

OTHER COMMERCIAL ENTERPRISES, REQUIRE PROFITS TO STAY IN BUSINESS. WHEN TAXES ARE INCREASED SO AS TO CUT TOO DEEPLY INTO THAT PROFIT, INVESTMENT ACTIVITY WILL INEVITABLY BE TRIMMED BACK.

TAX POLICY MAKERS SHOULD NOT CONFUSE THE PRODUCTION RATE OF A FIELD WITH ITS PROFITABILITY. SB 97 IMPOSES A HIGHER PRODUCTION TAX RATE ON LARGER FIELDS. THE AVERAGE PRODUCTION RATE PER WELL AT PRUDHOE BAY DURING THE MID-1990'S IS PROJECTED TO BE THE SAME AS AT LISBURNE TODAY. HOWEVER, SB 97 WOULD IMPOSE AN EFFECTIVE PRODUCTION TAX RATE ON PRUDHOE BAY AT THAT POINT IN TIME WHICH WOULD BE MORE THAN THREE TIMES HIGHER THAN ON LISBURNE TODAY. THIS DOESN'T MAKE SENSE.

PROJECTS UNDER CONSIDERATION TODAY TO INCREASE RECOVERABLE RESERVES AT PRUDHOE BAY REPRESENT STATE-OF-THE ART TECHNOLOGY, WITH COST PER BARREL SEVERAL TIMES HIGHER THAN THE INITIAL DEVELOPMENT PROJECTS AT PRUDHOE BAY. THE REDUCTION IN CRUDE OIL PRICES OVER THE LAST FEW YEARS HAS ALREADY CUT THE GO-AHEAD MARGIN SHORT. AN INCREASE IN PRODUCTION TAX AT THIS TIME WOULD ONLY FURTHER COMPOUND THE PROBLEM.

IT IS ESTIMATED THAT OVER 10 BILLION BARRELS OF OIL WILL BE LEFT IN THE PRUDHOE BAY RESERVOIR AFTER CURRENTLY PLANNED DEVELOPMENT HAS BEEN

COMPLETED. TO OBTAIN THE MAXIMUM RECOVERY, MORE AND MORE marginally PROFITABLE PROJECTS MUST BE IMPLEMENTED. FUTURE PROJECTS MAY INCLUDE:

DRILLING ON CLOSER SPACING,
DRILLING IN THINNER OIL COLUMNS,
EXPANDING ENHANCED OIL RECOVERY PROJECTS,
DEVELOPING SMALLER RESERVOIRS, AND
EXPANDING WORKOVER PROGRAMS.

IMPLEMENTING SUCH MARGINAL PROJECTS WILL ALLOW FOR PARTIAL RECOVERY OF THIS 10 BILLION BARRELS. HOW MUCH ADDITIONAL RECOVERY WE MAY EXPECT IS UNCERTAIN. HOWEVER, THESE PROJECTS HAVE TO BE JUSTIFIED BASED ON A SIMILAR RISK ASSESSMENT APPLIED TO EARLIER PRUDHOE BAY PROJECTS. THIS INCLUDES THE RISK OF A CHANGE IN THE TAX STRUCTURE.

WHILE THE CURRENT PRODUCTION TAX RATE IS HIGH COMPARED WITH OTHER STATES, IT HAS REPRESENTED A RELATIVELY STABLE PRODUCTION TAX POLICY, WHICH HAS ENCOURAGED ENORMOUS INVESTMENT. TO ELIMINATE ELF NOW, AT THE HISTORICAL TIME WHEN IT WAS INTENDED TO HAVE ITS IMPACT AND BENEFIT, WOULD BE A DEPARTURE FROM THIS STABLE TAX POLICY AND WOULD SEND A CLEAR MESSAGE TO OIL COMPANIES, AND OTHER INVESTORS, THAT STABILITY AND FAIRNESS ARE NOT

NECESSARILY CHARACTERISTICS OF ALASKA'S TAX POLICY. PLEASE CONSIDER THE LONG TERM IMPACT CAREFULLY BEFORE YOU SEND THAT MESSAGE. ELIMINATION OF ELF WILL MEAN THAT INVESTMENT DOLLARS AND JOBS SLATED FOR MARGINAL NORTH SLOPE PROJECTS ARE MORE LIKELY OVER THE LONG TERM TO GO TO LOWER RISK PROJECTS ELSEWHERE.

EXXON HAS TWO FINAL COMMENTS, ON SECTION 2 AND SECTION 4 OF SB 97.

SECTION 2 OF SB 97 WOULD REPEAL THE PROCEEDING UNDER CURRENT LAW WHEREBY A TAXPAYER CAN REBUT THE STATUTORY PRESUMPTION OF 300 BARRELS PER DAY AS PRODUCTION AT THE ECONOMIC LIMIT. THE TAXPAYER CAN DO THIS UNDER CURRENT LAW BY INTRODUCING EVIDENCE ON THE ECONOMICS OF THE PARTICULAR FIELD. SB 97 WOULD ARBITRARILY FIX THIS RATE AT 300 BARRELS PER DAY FOR ALL FIELDS. THE PROVISION IN CURRENT LAW WAS DESIGNED TO PROVIDE TAX RELIEF FOR MARGINAL FIELDS SO THAT THE PRODUCTION TAX BURDEN WOULD NOT BE A FACTOR IN SHUTTING DOWN THE FIELD. IT WORKS! THE OWNERS OF THE MILNE POINT FIELD APPLIED FOR RELIEF BEFORE THE DEPARTMENT OF REVENUE UNDER THIS PROVISION SUCCESSFULLY IN 1986. IN VIEW OF THE ADMINISTRATION'S DESIRE TO ENCOURAGE DEVELOPMENT OF MARGINAL FIELDS, IT MAKES NO SENSE TO REPEAL THIS PROVISION.

SECTION 4 OF SB 97 WOULD MAKE THE PROPOSED TAX INCREASES RETROACTIVE TO JANUARY 1, 1989. IN THE EVENT THAT SB 97 WERE TO BECOME LAW, IT WOULD BE UNDULY HARSH TO GIVE ITS TAX INCREASES ANY RETROACTIVE EFFECT. SB 97 WOULD EFFECT A MAJOR CHANGE IN ALASKA'S PRODUCTION TAX POLICY. TO APPLY SUCH A CHANGE TO OIL ALREADY PRODUCED, TRANSPORTED, AND MARKETING WOULD BE FUNDAMENTALLY UNFAIR. THE INDUSTRY'S PERCEPTION OF INSTABILITY IN ALASKA'S TAX POLICY WHICH WOULD RESULT FROM PASSAGE OF SB 97 WOULD ONLY BE COMPOUNDED BY RETROACTIVE APPLICATION. FURTHERMORE, RETROACTIVE APPLICATION WOULD RAISE SERIOUS CONSTITUTIONAL ISSUES.

TO SUMMARIZE, EXXON URGES YOU NOT TO SUPPORT SB 97. IT COULD HAVE A PROFOUND EFFECT ON FUTURE DEVELOPMENT INVESTMENT AT PRUDHOE BAY, COMPOUNDING THE ALREADY SERIOUS SITUATION BROUGHT ABOUT BY LOWER CRUDE PRICES. ANY BENEFITS TO ALASKA FROM MARGINAL FIELD DEVELOPMENT PROVIDED BY SB 97 WOULD BE MORE THAN OFFSET BY THE IMPACT ON ROYALTY AND TAX COLLECTIONS FROM MARGINAL PROJECTS AT PRUDHOE BAY AND KUPARUK. TO PASS SB 97 INTO LAW WOULD BE ILL-ADVISED AND SHORT-SIGHTED. CONTINUED STABILITY IN PRODUCTION TAX POLICY WILL STRIKE THE BEST BALANCE BETWEEN FUTURE DEVELOPMENT AND STATE REVENUE COLLECTION. ABOVE ALL, ALASKA MUST REMAIN COMPETITIVE IN THE QUEST FOR FUTURE INVESTMENT DOLLARS.

THANK YOU, THIS CONCLUDES MY TESTIMONY.

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1 IN THE SENATE

BY ADAMS

2

SENATE BILL NO. 97

3

IN THE LEGISLATURE OF THE STATE OF ALASKA

4

SIXTEENTH LEGISLATURE - FIRST SESSION

5

A BILL

6 For an Act entitled: "An Act relating to the oil and gas properties pro-
7 duction tax; and providing for an effective date."

8 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

9 * Section 1. AS 43.55.013(b) is repealed and reenacted to read:

10 (b) The economic limit factor for oil production of a lease or
11 property shall be computed according to the following formula:

12
$$(1 - [PEL/TP]) \exp ([55,000,000 \times WD] / [PEL \times TP/Days])$$

13 where: PEL = the monthly production rate at the economic limit;

14 TP = the total production during the month for which the tax
15 is to be paid;

16 WD = the total number of well days in the month for which
17 the tax is to be paid;

18 Days = the number of days in the month for which the tax is to
19 be paid; and

20 where "exp" indicates that the expression following it is an exponent.

21 * Sec. 2. AS 43.55.013(d) is amended to read:

22 (d) The monthly production rate at the economic limit for a
23 lease or property is [PRESUMED TO BE] 300 barrels times the number of
24 well days for the lease or property during the month for which the tax
25 is to be paid. [THE TAXPAYER MAY REBUT THIS PRESUMPTION AT A FORMAL
26 HEARING UNDER AS 43.05.240 BY PROVIDING CLEAR AND CONVINCING EVIDENCE
27 OF A DIFFERENT MONTHLY PRODUCTION RATE AT THE ECONOMIC LIMIT FOR THE
28 LEASE OR PROPERTY. THE HEARING SHALL BE HELD BEFORE FEBRUARY 15 OF
29 THE YEAR OR WITHIN SIX MONTHS AFTER COMMENCEMENT OF OIL PRODUCTION FOR

1 A LEASE OR PROPERTY. THE MONTHLY PRODUCTION RATE AT THE ECONOMIC
2 LIMIT FOR THE LEASE OR PROPERTY BASED UPON THE CLEAR AND CONVINCING
3 EVIDENCE OF THE TAXPAYER SHALL BE CALCULATED BY DIVIDING THE VALUE
4 DETERMINED UNDER (f) OF THIS SECTION INTO THE AVERAGE MONTHLY DIRECT
5 OPERATING COST DETERMINED UNDER (e) OF THIS SECTION AND SHALL BE USED
6 FOR PURPOSES OF THIS SECTION FOR ALL OIL PRODUCTION DURING THAT CALEN-
7 DAR YEAR FROM THE LEASE OR PROPERTY.]

8 * Sec. 3. AS 43.55.013(e) and (f) are repealed.

9 * Sec. 4. This Act is retroactive to January 1, 1989, and applies to
10 oil produced after December 31, 1988.

11 * Sec. 5. This Act takes effect immediately under AS 01.10.070(c).

STATE OF ALASKA
1989 LEGISLATIVE SESSION

Bill Version: SB 97
Publish Date: _____

FISCAL NOTE

REQUEST:

Revision Date: _____
Title: Act relating to the oil and gas
properties production tax
Sponsor: _____
Requestor: _____

Agency Affected: Department of Revenue
BRU: Oil & Gas Audit Division

Components: _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94
OPERATING						
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL	0	0	0	0	0	0
CONTRACTUAL	0	0	0	0	0	0
SUPPLIES	0	0	0	0	0	0
EQUIPMENT	0	0	0	0	0	0
LANDS & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE	43,000	111,000	126,000	141,000	164,000	155,000

FUNDING: (Thousands of Dollars)

GENERAL FUND	0	0	0	0	0	0
FEDERAL FUNDS	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS: See attached analysis.

Prepared By: Roger Marks

Division: Dept. of Revenue, Oil & Gas Audit Division

Phone: 277-5627

Date: February 10, 1989

Approved by Commissioner: Hugh Malone

Agency: Department of Revenue

Date: 2/15/89

Distribution (by preparer):

Legislative Finance

Legislative Sponsor

Requestor

Office of Management and Budget

Impacted Agency(ies)

Fiscal Analysis of SB 97

This bill modifies the economic limit factor (ELF) formula used in computing the production (severance) tax on oil.

The bill (1) introduces the rate of field production into the exponent of the current ELF formula; (2) repeals the so-called "rounding rule," the provision of current law which states that for any month during the first 10 years of commercial oil production for which the computed ELF of a lease or property exceeds 0.7 the ELF shall be considered to be one; and (3) fixes the production at the economic limit (PEL) at 300 barrels times the number of well days in the month.

Since the bill carries an effective date of January 1, 1989, this analysis has assumed that the bill will apply to oil produced after December 31, 1988. (Because the severance tax on oil for a given month is due during the following month, a tax change which takes effect on January 1 would not affect revenues until February.)

This fiscal note was calculated using the oil price and production assumptions of the Department of Revenue's Fall 1988 Petroleum Production Revenue Forecast mid-case scenario updated for actual data through November of 1988. ^{1/}

Additional revenues for future years in millions of dollars are as follows:

1995	148
1996	141
1997	133
1998	119
1999	115
2000	107
2001	101
2002	94
2003	85
2004	77
2005	72
2006	61
2007	52
2008	37
2009	26
2010	9

^{1/} Had the fiscal note used the oil price and volume assumptions of the "Consensus Revenue Analysis" of January 24, 1989, the FY 89 fiscal impact would be \$49 million and the FY 90 fiscal impact would be \$117 million.

Size of Field Where Taxes Will Increase or Decrease Under SB 97

SB 97 modifies the ELF statute in two ways which affect the relationship of field size to the tax rate for the field: (1) by modifying the formula; and (2) by repealing the "rounding rule." (Under current law if a field has an ELF of greater than 0.7 for the first ten years of the field, the ELF is elevated to 1.0. This is called the "rounding rule.") The combined effect of these two changes will increase the severance tax on fields producing an average of more than approximately 300,000 barrels per day, and will reduce the severance tax on fields producing an average of less than approximately 300,000 barrels per day. An analysis of these two changes and the underlying assumptions follows.

The change in the formula would raise taxes on fields which produce more than approximately 120,000 barrels per day and for which the rounding rule does not apply. (Only Prudhoe Bay and Kuparuk fit this description. The rounding rule does not apply to them now because Prudhoe Bay is older than ten years, and Kuparuk's current ELF is less than 0.7.) The Bill would cut taxes -- or leave them at zero -- for any field producing less than approximately 120,000 barrels per day. If a field produces an average of less than 300 barrels per well per day, their taxes are zero under current law and the new Bill.

The Bill also initially decreases the ELF for new higher-productivity (where average well productivity is greater than 1500 barrels per day) large fields (over the 120,000 barrel per day level). Under current law, fields producing more than an average of 1500 barrels per well per day will have an ELF of greater than 0.7, and would have an initial effective ELF of 1.0 because of the rounding rule. Since the first ten years of the field is when the greatest proportion of oil is produced (upwards of 75 percent), these large fields could have reduced weighted average severance taxes over the entire life of the field under the Bill since it eliminates the rounding rule. The exact size of field that will benefit over the entire life of the field will depend on its well productivity, decline profile, and the discount rate. We estimate that a field with the same well productivity and decline characteristics as Endicott, for example, (which produces 100,000 barrels per day and produces 2800 barrels per well per day average), but with peak production of 1,000,000 barrels per day, would have the same discounted (8%) weighted average effective ELF over the life of the field under the Bill as it would under current law. Fields producing less than that amount would have a lower ELF than under current law.

A weighted average of all field sizes and average per well productivities from all Alaska fields indicates that on average fields which produce less than approximately 300,000 barrels per day will have a reduced severance tax under SB 97.

SECTIONAL ANALYSIS OF SB 97: LEGISLATION REVISING

THE ECONOMIC LIMIT FACTOR

Section 1. This section modifies the severance tax's Economic Limit Factor (ELF) as it relates to oil production.

Under current law and under this section, the ELF statute reduces the effective severance tax rate on oil production by applying a formula which considers productivity. The ELF formula always produces a fraction between zero and one. That fraction is multiplied with the nominal tax rate to get the effective tax rate. This means that the higher the ELF, the higher the actual tax paid; the lower the ELF, the lower the actual tax paid. This also means that if the ELF is zero, the severance tax rate is zero.

This section changes the ELF statute in two ways.

First, this section modifies the formula for calculating the "economic limit" of oil production. The current law considers only average per-well productivity of the field. The formula here adds consideration of total field productivity to the current ELF formula. Second, this section repeals the provision of current law which states

that for any month during the first 10 years of commercial oil production for which a lease or property's computed ELF exceeds 0.7, the ELF shall be considered to be one. This section's repeal of this "rounding" rule of current law would result in initial lower taxes for any field in this situation.

Compared to current law, these two changes raise taxes on fields producing on average more than 300,000 barrels a day and reduce taxes on fields producing on average less than 300,000 barrels a day.

Section 2. This section fixes the monthly production at the economic limit (PEL) at 300 barrels per well per day. The PEL is a rough approximation of the number of barrels a well must produce to cover costs.

Under current law, the PEL is presumed to be 300 barrels a day, and the taxpayer may rebut this presumption at a hearing. This section repeals the provisions for rebutting the 300 barrel per day presumption.

Section 3. This section repeals two provisions of current law which are only necessary for setting a PEL in a hearing.

Section 4. This section makes the legislation apply to oil produced after December 31, 1988.

Section 5. This section sets an immediate effective date.

The ELF

A Policy Perspective

April 1988

**Division of Policy
Office of the Governor**

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will provide a more reliable incentive for marginal field development — the ELF's original purpose — by lowering tax rates on Alaska's smaller fields, such as Milne Point, Endicott, and Lisburne.

This paper attempts to fully discuss the reasons behind our perspective. We have tried to include all the relevant facts. We also have tried to avoid unnecessary complication. If others have additional information and perspectives, we welcome hearing from them.

Mary Halloran
Director, Division of Policy
Office of the Governor