HB

545

STATE OF ALASKA
THE LEGISLATURE

POUCH Y · STATE CAPITOL
JUNEAU, ALASKA 99811
907·465·3800

LEGISLATIVE AFFAIRS AGENCY

LEGISLATIVE REFERENCE LIBRARY

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Mary Van Nimwegen

Joint House Finance / Resources

3-16-87

(9)

HOUSE COMMITTEE REPORT

Date referred: 3/4/87 FURTHER REFERRALS: Finance

DATE: _____

The Resources Committee has considered HB 164

"An Act relating to the oil and gas properties production tax; and providing for an effective date."

RECOMMENDS:

[ ] replace with _____ [ ] the same title

[ ] attached amendment(s) [ ] a new title

[ ] do pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

[ ] additional referral to the _____ Committee

ADOPTS: [ ] _____ letter of intent

ATTACHES NEW FISCAL NOTE(s):

[ ] fiscal impact

[ ] zero fiscal note

[ ] zero with analysis

[ ] same as previous fiscal note published _____

[ ] same as previous zero fiscal note published _____

SIGNING DO PASS:

Mike Navarre

Sam Cox

Cliff Davidson

SIGNING OTHER RECOMMENDATIONS:

Adelheid Herrmann No Rec

Heinrich Springer No Rec

Do Not Pass

Chairman's signature

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Bill Version: CS HB 164
REQUEST — Publish Date:

Revision Date:
Agency Affected: Revenue
Title: An act relating to the oil and gas production tax.
BRU: Audit
Sponsor: Rules/Goverror
Components: Oil & Gas
Requestor: House Resources

EXPENDITURES/REVENUES: (Millions of Dollars)

	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
OPERATING						
PERSONAL SERVICES	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-
CONTRACTUAL	-	-	-	-	-	-
SUPPLIES	-	-	-	-	-	-
EQUIPMENT	-	-	-	-	-	-
LANDS & STRUCTURES	-	-	-	-	-	-
GRANTS, CLAIMS	-	-	-	-	-	-
MISCELLANEOUS	-	-	-	-	-	-
TOTAL OPERATING	-	-	-	-	-	-
CAPITAL	-	-	-	-	-	-
REVENUE	-	88.7	108.5	117.6	112.9	117.8

FUNDING: (Thousands of Dollars)

GENERAL FUND	-	-	-	-	-	-
FEDERAL FUNDS	-	-	-	-	-	-
OTHER	-	-	-	-	-	-
TOTAL	-	-	-	-	-	-

POSITIONS:

FULL-TIME	-	-	-	-	-	-
PART-TIME	-	-	-	-	-	-
TEMPORAPY	-	-	-	-	-	-

ANALYSIS: The above numbers represent the increase in general fund revenues if this bill becomes law. The key assumptions are introduction of a 55,000,000 scaling factor into the exponent of the current ELF formula and fixing the value of the Production at the Economic Limit (PEL) at 300 barrels per well per day. The production impact from FY88 through FY2005 represents a cumulative total loss of 20.9 million barrels.

Prepared By: Chuck Logsdon — Phone: 276-5364
Division: Office of the Commissioner — Date: 3/19/87

Approved by Commissioner: [signature] — Date: 3/19/87
Agency: Revenue

Distribution (by Agency preparing fiscal note):
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)
- Senate Secretary

Current Law (-MM $)

	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	Total
Sohio	262.915268	4.917486	0	2.594634	2.115	272.54[illegible]
Arco	113.[illegible]	20.571051	0	.000750	[illegible]	[illegible]
Exxon	113.[illegible]	.154476	0	.[illegible]	[illegible]	[illegible]
Mobil	[illegible]	.150105	0	0	0	[illegible]
Phillips	[illegible]	.107075	0	0	0	9.760335
Chevron	[illegible]	.047201	.105212	0	0	[illegible]
Texaco	2.802492	0	0	0	0	2.802492
A. Hess	2.750594	0	0	0	0	2.750594
Shell	.726572	0	0	0	0	.726572
Marathon	.25949	0	0	0	0	.25949
BP	.051098	14.765[illegible]	0	0	0	14.817229
LL & E	.207592	0	0	0	0	.207592
Union	0	2.196992	0	.39795	0	2.594942
Conoco	0	0	.474780	0	0	.474780
CIRI	0	0	0	.024635	0	.024635
Total	513.98	42.91	.58	3.814635	10.58	576.[illegible]4635

COMPANY FIELD EFFECT ADMIN. PROPOSAL

	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	Total	Delta Base
Sohio	310.718044	4.97364	0	2.847936	2.132	320.72162	48.17[illegible]
Arco	133.585452	20.80596	0	.000832	4.364	158.756244	20.918580
Exxon	133.585452	.15624	0	.874432	4.364	138.980124	20.765146
Mobil	11.65346	.1519	0	0	0	11.80536	1.794555
Phillips	11.408124	.1085	0	0	0	11.516624	1.756321
Chevron	4.354714	.04774	.25396	0	0	4.656414	.819243
Texaco	3.312036	0	0	0	0	3.312036	.509544
A. Hess	3.250702	0	0	0	0	3.250702	.500108
Shell	.858676	0	0	0	0	.858676	.132104
Marathon	.30667	0	0	0	0	.30667	.04718
BP	.061334	14.[illegible]	0	0	0	14.995274	.178045
LL & E	.245336	0	0	0	0	.245336	.037744
Union	0	2.22208	0	.4368	0	2.65888	.063938
Conoco	0	0	1.14604	0	0	1.14604	.671252
CIRI	0	0	0	.02704	0	.02704	.002405
Total	613.34	43.4	1.4	4.18704	10.91	673.23704	96.372405

COMPANY FIELD EFFECT FIELD ELF

	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	Total	Delta Base
Sohio	305.[illegible]	9.258954	0	.708444	.794	315.167516	42.[illegible]
Arco	131.274594	34.51200[illegible]	0	.000209	1.500	167.374920	27.[illegible]
Exxon	131.274594	.259164	0	.239620	1.500	133.[illegible]	15.1[illegible]
Mobil	11.45187	.251965	0	0	0	11.703835	1.69303
Phillips	11.210778	.179975	0	0	0	11.390753	1.63845
Chevron	4.279383	.079189	.003628	0	0	4.3622	.525029
Texaco	3.254742	0	0	0	0	3.254742	.45225
A. Hess	3.194469	0	0	0	0	3.194469	.443875
Shell	.843822	0	0	0	0	.843822	.11725
Marathon	.301365	0	0	0	0	.301365	.041875
BP	.060273	24.771759	0	0	0	24.832032	10.014803
LL & E	.241092	0	0	0	0	.241092	.0335
Union	0	3.685[illegible]	0	.1197	0	3.805563	1.210646
Conoco	0	0	.016372	0	0	.016372	-.458416
CIRI	0	0	0	.00741	0	.00741	-.017225
Total	602.73	71.[illegible]	.02	1.[illegible]	[illegible]	[illegible]	[illegible]

STEVE COWPER
GOVERNOR

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

March 3, 1987

The Honorable Pen Grussendorf
Speaker of the House
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Dear Representative Grussendorf:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill relating to the oil and gas properties production tax. The primary effect of the bill is to postpone the application of the "true" economic limit factor (ELF) to the Prudhoe Bay field. The bill also amends the economic limit factor provisions applying to all oil fields so that the ELF is not sensitive to changes in the value of oil.

Existing AS 43.55.011(e) provides that an oil producer must calculate its production (severance) tax by multiplying the nominal rate calculated under AS 43.55.011(b) and (c) by the economic limit factor determined under AS 43.55.013. The ELF is a formula that has the effect of reducing the severance tax rate. In 1981, the legislature made several changes in oil and gas taxes: the income tax was changed to substitute modified apportionment for separate accounting; the nominal rate of the severance tax was increased for some fields; and the application of the ELF to a lease or property with an ELF of more than .7 was suspended until after that lease or property had been in commercial production for 10 years. Ch. 116, SLA 1981. Suspension of application of the ELF was accomplished by providing that, if the ELF was more than .7, then the ELF was considered to be "one." AS 43.55.011(b)(3). Thus, when multiplying the severance tax rate by the ELF, the full amount of the tax is the product.

Only the Prudhoe Bay and Lisburne fields currently have an ELF greater than .7. The Lisburne ELF is expected to fall below .7 after fiscal year 1988, but the Prudhoe Bay ELF is expected to remain about .7 for a number of years. Prudhoe Bay will have been in production for 10 years in June, 1987; thus, absent an amendment to AS 43.55.013(b)(3), the "true" ELF, as calculated under AS 43.55.013(b)(1), will begin to apply to that field at that time.

The fiscal note on the 1981 legislation did not include projections beyond FY 1985, but an analysis by the Legislative Finance Division showed that application of the "true" ELF provision would cause state revenue to fall precipitously in FY 1988. Governor Hammond noted this possibility, but expressed "full confidence in the ability of the legislature to deal at that time" with adverse revenue consequences, should they prove to be serious. Statement of Governor Hammond on signing FCCSSB 524 (ch. 110, SLA 1981); see July 27, 1981 press release on oil and gas legislation, fourth page.

Application of the "true" ELF to Prudhoe Bay would result in serious consequences for the state in the coming fiscal year: state severance collections would be reduced by over 15 percent, and FY 1990 revenue would fall by $93,000,000 (already accounted for in the official "mean" forecast). Section 1 of the attached bill would prevent this precipitous decline in revenue by amending AS 43.55.011(h)(2) to delay the applicability of the true ELF to Prudhoe Bay for an additional five years. Section 2 of the bill also makes a conforming amendment to AS 43.55.011(h)(3) and (4). So long as the "true" ELF does not apply, the severance tax rate will be the full 15 percent of value, or $.80 a barrel, whichever is greater, subject to the adjustment in AS 43.55.011.

The bill also changes the ELF provisions for all oil fields to remove the sensitivity of the ELF to price fluctuations. An element of the ELF calculation is the "PEL," or "production at the economic limit." The PEL represents the number of barrels a producer must produce in order to recover the costs of production. Currently, the PEL is presumed to be 300 barrels per well per day, but the taxpayer may rebut this presumption at a hearing before the Department of Revenue. At the hearing, the PEL would be calculated by dividing the cost of production into the value of the oil. AS 43.55.013(d). If the price of oil drops, the producer may be able to prove an entitlement to a PEL in excess of 300 barrels; if so, the ELF for that producer will go down. Thus, if prices fall drastically, the state loses severance tax revenue not only because the severance tax is applied against a lower value of oil, but also because the severance tax rate itself goes down as the result of a PEL hearing. Earlier in 1986, because of low prices, we were faced with the possibility that the state might suffer from this double reduction in severance tax revenue.

Section 2 of the attached bill deals with that problem by repealing the portion of existing law that provides for a hearing to change the PEL. The PEL is then simply set at 300 barrels per day. As a result, the PIF will be sensitive to changes in the amount of production, but will no longer be sensitive to fluctuations in price or the costs of production. Section 3 of the bill repeals two subsections in AS 43.55.011 dealing with the two elements of the hearing: costs and values. These changes do not apply to the production of gas.

I urge your early consideration and passage of this bill.

Sincerely,

Steve Cowper
Governor

M E M O R A N D U M

STATE OF ALASKA

Department of Revenue

Petroleum Research Section

February 27, 1987

To: Vincent D. Wright, Chief of Research

From: Charles Logsdon, Petroleum Economist

Subject: More ELF

Per your request, I have examined the revenue and production impact of extending the 10 year period during which the ELF is subject to the .7 or greater test to 15 years and fixing the value of the Production at the Economic Limit (PEL) at 300 barrels per well per day. Prudhoe Bay and Lisburne are the fields currently producing with a calculated ELF greater than .7 and thus would be directly impacted by this change in the State severance tax law. On average, the calculated ELF for Prudhoe is not expected to fall below 0.7 over the next 5 years. We expect the Lisburne ELF to fall below 0.7 in FY 1989 and subsequent years.

By setting the PEL at 300, the ELF no longer would be sensitive to the price of oil or the cost of producing oil and would be totally dependent on per barrel productivity for a producing lease or property. Over the next 5 years as Prudhoe Bay production begins to decline the only reason for an ELF less than 0.7 would be if a significantly greater than expected number of additional wells were drilled. For example we currently expect Prudhoe to produce on average, 0.984 million barrels per day in 1992 from 465 wells providing an ELF of.7911. If this same amount of oil were produced from 705 wells, the ELF would be equal to .6906.

The following tables illustrate the revenue impact and production impact of extending the ELF time line to 15 years and fixing the value of PEL at 300. These results are generated by the DOR revenue simulation model using the December 1986 input assumptions. The most significant result other than the revenues generated is that there is almost no average expected effect on North Slope production.

STATE OF ALASKA
THE LEGISLATURE

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Mary Van Nimwegen

Joint Meeting of: House Finance Cmte. - March 18, 1987
House Resources Cmte.

State of Alaska
MEMORANDUM

Office of the Governor

Division of Policy

P.O. Box AM, Juneau, AK, 99811
Tel. 465-3568 / Mail Stop 0164

TO: Rep. Drew Pearce DATE: 19 March 1987

FROM: Gregg Erickson
Senior Economist

SUBJECT: Shares of Alaska Oil Revenue.

I have enclosed OMB's most recent (April 11, 1986) analysis of the shares of net revenue from oil production and transportation in Alaska during the FY 82-85 period. Oil industry Alaska profits over this 4-year period (net of capital charges, costs, royalties and taxes) totaled $22,103 million.

The profits earned in Alaska can be compared with the $6 billion in oil industry invested in Alaska over the same period. Testimony of Harold Heinze, House Finance transcript, April 12, 1985, p. 130.

I have also provided copies of our correspondence with Exxon regarding the "shares" analysis.

cc: Rep. Cotten
Mary Halloran

STATE, FEDERAL AND INDUSTRY SHARES OF ALASKA OIL RESOURCE INCOME: FISCAL 1982-1985

(millions of dollars except as noted)

Fiscal year	[1] Total Revenue	[2] State Royalty	[3] Sever. Conser. tax	[4] Total Prop. tax	[5] Total Oper. Costs	[6] Total Deprec.	[7] Total Acquis. Costs	[8] Windfall Profits Tax
1982	$16,456	$1,553	$1,581	$276	$940	$602	$1	$2,018
1983	$15,470	$1,448	$1,494	$307	$1,101	$780	$1	$1,018
1984	$14,955	$1,409	$1,393	$358	$1,259	$998	$1	$412
1985	$15,136	$1,390	$1,389	$397	$1,449	$1,093	$1	$70

Fiscal Year	[9] Uncap. Interest Expense	[10] Explore. Costs	[11] Admin. Costs	[12] Other Deducs.	[13] Total Deducs.	[14] State Taxable Net Income	[15] Corp. Petrol Income Tax	[16] Federal Taxable Income
1982	$721	$191	$236	$149	$8,268	$8,188	$669	$7,519
1983	$676	$204	$252	$142	$7,423	$8,047	$236	$7,811
1984	$614	$219	$265	$136	$7,064	$7,891	$265	$7,626
1985	$566	$234	$278	$130	$6,997	$8,139	$169	$7,970

Fiscal Year	[17] Federal Corp. Income Tax	[18] Oil Industry Alaska Profits	[19] Total Federal Tax	[20] Total State Tax & Royalty	[21] ----Share of Oil Income---- State	[22] Federal	[23] Industry
1982	$2,098	$5,421	$4,116	$4,079	30%	30%	40%
1983	$2,140	$5,671	$3,158	$3,485	28%	26%	46%
1984	$2,242	$5,384	$2,654	$3,425	30%	23%	47%
1985	$2,343	$5,627	$2,413	$3,345	29%	21%	49%

SOURCES AND FORMULAS --

Column [1]: Vincent Wright, chief of research, to Mary Nordale, Commissioner of Revenue, Memorandum of October 31, 1985, Table 3.

Columns [2] & [3]: January 1986 DOR Revenue Sources, p. 39.

Columns [4] to [12]: Vincent Wright, loc. cit.

Column [13]: sum of columns [2] through [12]

Column [14]: column [1] - column [13]

Column [15]: Revenue Sources, p. 39.

Column [16]: column [14] - column [15].

Column [17]: column [16] * (production-weighted average tax rate -- 1982 = .279; 1983 = .274; 1984 = .294; 1985 = .294). Company effective rates for '82-84 from R. McIntire and R. Folen, "Corporate Income Taxes in the Reagan Years," Oct. 1984, pp. 32-36; '85 estimated by OMB.

Column [18]: column [16] - column [17].

Column [19]: column [8] + column [17].

Column [20]: sum of columns [2], [3], [4], and [15].

Column [21]: (column [18])/(sum of columns [18], [19], and [20]).

Column [22]: (column [19])/(sum of columns [18], [19], and [20]).

Column [23]: (column [20])/(sum of columns [18], [19], and [20]).

Office of Management and Budget
Division of Strategic Planning
revised April 11, 1986

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Bill Version : HB 164
Publish Date : HOUSE 3/4/87

REQUEST:

Revision Date:
Title : An Act Relating to the Oil and Gas Properties Production Tax
Sponsor : Rules/Governor
Requestor : Rules

Agency Affected : Revenue
BRU :
Components :

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING						
CAPITAL						
REVENUE		76,730.0	91,950.0	98,480.0	99,850.0	105,610.0

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART TIME						
TEMPORARY						

ANALYSIS : (Attach a separate page if necessary)

SEE ATTACHTED ANALYSIS

Vincent Wright

Prepared by : Chuck Logsdon
Division : Revenue/Research
Phone : 276-5364
Date : March 2, 1987

Approved by Commissioner : Hugh Malone
Agency : Department of Revenue
Date : 3/2/87

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)
Senate Secretary

Revenue Impact of Extend5 (Million $)

Fiscal Year	Delta 30%	Delta Mean
1987	0	0
1988	76.73	96.26
1989	91.95	118.06
1990	98.48	128.33
1991	99.85	132.92
1992	105.61	139.09
1993	5.73	7.3
1994	3.9	7.64
1995	3.66	6.56
1996	4.55	5.28
1997	3.67	5.55
1998	2.01	3.91
1999	2.53	2.62
2000	-.16	2.08
2001	-.1	2.79
2002	-.82	2.68
2003	-.73	2.28
2004	.53	2.1
2005	.49	1.87

No. 1
HB 164
3/4/87

Production Impact of Extend5 (Million bbls/yr)

Fiscal Year	Prudhoe Bay	Kuparuk	Milne Point	Endicott	Lisburne	West Sak	Other Onshore	Other Offshore	Total
1987	0	0	0	0	-.01	0	0	0	-.01
1988	-.77	-.12	-.04	-.02	-.02	0	0	0	-.97
1989	-.69	-.12	-.07	-.04	-.03	0	0	0	-.95
1990	-.6	-.12	-.11	0	.03	0	0	0	-.86
1991	-.57	-.11	-.15	-.03	-.05	0	0	0	-.91
1992	-.52	-.1	-.15	-.06	-.05	0	0	0	-.88
1993	-.49	-.09	-.14	-.06	-.06	0	0	0	-.84
1994	-.44	-.11	-.14	-.04	-.07	0	0	0	-.8
1995	-.39	-.07	-.09	-.05	-.05	0	0	0	-.65
1996	-.35	-.06	-.12	-.05	-.05	0	0	0	-.63
1997	-.32	-.08	.01	-.04	-.06	0	0	0	-.49
1998	-.43	-.05	.03	-.03	-.09	0	0	0	-.57
1999	-.25	-.04	.02	-.01	-.02	0	-.02	0	-.32
2000	-.22	-.03	-.02	-.01	-.03	0	-.02	0	-.33
2001	-.2	-.03	.02	0	-.02	0	-.02	0	-.25
2002	-.18	-.02	.01	0	-.02	0	-.02	0	-.23
2003	-.16	-.01	-.01	0	-.01	0	-.01	0	-.2
2004	-.19	0	.04	0	-.01	0	-.01	0	-.17
2005	-.13	.01	.04	0	0	0	-.01	0	-.09
									0
									0
Total	-6.9	-1.15	-.87	-.44	-.68	0	-.11	0	-10.15

M E M O R A N D U M

STATE OF ALASKA

Department of Revenue

Petroleum Research Section

4164

February 27, 1987

To: Vincent D. Wright, Chief of Research

From: Charles Logsdon, Petroleum Economist

Subject: More ELF

Per your request, I have examined the revenue and production impact of extending the 10 year period during which the ELF is subject to the .7 or greater test to 15 years and fixing the value of the Production at the Economic Limit (PEL) at 300 barrels per well per day. Prudhoe Bay and Lisburne are the fields currently producing with a calculated ELF greater than .7 and thus would be directly impacted by this change in the State severance tax law. On average, the calculated ELF for Prudhoe is not expected to fall below 0.7 over the next 5 years. We expect the Lisburne ELF to fall below 0.7 in FY 1989 and subsequent years.

By setting the PEL at 300, the ELF no longer would be sensitive to the price of oil or the cost of producing oil and would be totally dependent on per barrel productivity for a producing lease or property. Over the next 5 years as Prudhoe Bay production begins to decline the only reason for an ELF less than 0.7 would be if a significantly greater than expected number of additional wells were drilled. For example we currently expect Prudhoe to produce on average, 0.984 million barrels per day in 1992 from 465 wells providing an ELF of.7911. If this same amount of oil were produced from 705 wells, the ELF would be equal to .6906.

The following tables illustrate the revenue impact and production impact of extending the ELF time line to 15 year and fixing the value of PEL at 300. These results are generated by the DOR revenue simulation model using the December 1986 input assumptions. The most significant result other than the revenues generated is that there is almost no average expected effect on North Slope production.

STATE OF ALASKA 1986 LEGISLATIVE SESSION
FISCAL NOTE

Revision Date : _____

REQUEST

Bill/Resolution No. : HB 545
Title : An Act Relating to the Oil Production Tax

Sponsor : House Finance Committee
Requestor : House Finance Committee
Date of Request : 2/3/86

FISCAL DETAIL

Agency Affected : _____
BRU : _____

Components : _____

EXPENDITURES/REVENUES : (Thousands of Dollars)

OPERATING	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING						
CAPITAL						
REVENUE			155,720	143,140	155,310	138,410

FUNDING : (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS :

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS : Attach a separate page if necessary

See attached.

Prepared by : Chuck Logsdon — Phone : 465-2173
Division : Research — Date : 2/20/86

Approved by Commissioner : [signature] — Date : 2/20/86
Agency : _____

Distribution (by Agency preparing fiscal note) :
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

10/25/85

Analysis

This bill would change the oil production tax by altering the formula for calculating the economic limit factor (ELF) and making the calculated value of ELF apply to the tax rate in all instances. The change in formula results in a value for ELF which is higher or lower than currently calculated depending upon whether an oil field produces more or less than 80,436 Bbls/Day. Applying the calculated value of ELF in all instances results in a lower effective tax rate for fields producing less than 80,436 bbls/day and for fields which have an ELF equal to or greater than .7 and which will have been in production less than 10 years upon the effective date of the bill. The effective tax rate will increase for those fields which produce more than 80,436 b/d, and which have been in production more than 10 years. Under current law, the ELF is set to 1.0 when a field has been in production less than 10 years and has a calculated ELF greater than or equal to .7, otherwise the calculated ELF applies. Prudhoe Bay because of its immense size and productivity is in this category of oil fields. Prudhoe Bay began production in 1977 so under current law the production tax rate is scheduled to fall in FY 1988 since an ELF less than 1.0 will be applied to the nominal tax rate. This bill would apply an ELF much greater than that calculated under the current formula. As a result the tax rate on Prudhoe Bay will decrease only a small amount in FY 1988 and beyond, so that tax revenues for Prudhoe Bay will increase over the current projections.

The Revenue impacts estimated in this fiscal note are for the 30 percent case. The effect of this bill was analyzed using the Petrev model. The production effect is based on the change in the average expected production from the North Slope oil fields using the economic feasibility subroutine of that model. The actual realized production impact could be much larger or smaller if assumptions other than tax rate were changed i.e. price, however several issues are suggested by these results. The first is that the effect of the tax on feasibility given the Petrev December oil price assumptions does not appear large since Prudhoe Bay produces 45 million bbls. every month. Second the major impacts on production would occur in Prudhoe Bay, Kuparuk and West Sak Sands. This occurs because of the impact on enhanced recovery for Prudhoe and Kuparuk, and because of the marginal economics and production characteristics of West Sak (significant production but a very large number of wells).

Production Effect

FY 1987 - FY 2000

Field		Average Expected Production Effect
Prudhoe Bay	*	-22.37 million bbls.
Kuparuk	*	-15.72 million bbls.
Milne Pt.		3.3 million bbls.
Endicott		-1.45 million bbls.
Lisburne		-.67 million bbls.
West Sak		-15.97 million bbls.
Other Onshore		6.85 million bbls.
Other Offshore		.47 million bbls.
TOTAL		-45.56 million bbls.

*Enhanced Recovery Effect

MEMORANDUM State of Alaska

TO: Vincent Wright, VW
Chief of Research

DATE: December 3, 1986

FILE NO.:

THRU:

TELEPHONE NO.:

SUBJECT: ELF presentation for the Tax Committee

FROM: Charles Logsdon, CL
Petroleum Economist

Per your request, enclosed is the latest draft of my presentation on the ELF for the joint Tax Committee meeting December 4, 1986. We have essentially updated the analysis prepared for the cancelled October 15, 1986 meeting using the assumptions underlying the December petroleum production revenue forecast. Unfortunately, due to the severe time constraint in preparing this updated analysis, "minor" revisions in the numbers may be necessary. As you will notice, the new input assumptions do not materially change the original analysis.

from Joint Special Committee on Tax Policy, Supplement to preliminary report February 1987

ANALYSIS OF ELF ALTERNATIVES

State of Alaska
Department of Revenue
December 4, 1986

The Effect of Four Possible Changes in the ELF on State of Alaska Severance Tax Revenues

The purpose of this brief note is to examine the effect of changing the relationship of the Economic Limit Factor (ELF) to State of Alaska Severance taxes. The ELF is a number with a value of between zero and one which is multiplied by the nominal severance tax rate or the cents per barrel tax floor to reduce the severance taxes paid as an oil or gas producing lease approaches its economic breakeven point. This analysis will specifically examine how changes in the application of the ELF and in the ELF itself impact oil revenues and production. The focus will be on the North Slope. Cook Inlet production will be considered seperately since the economics of these producing fields are dominated by costs associated with the shutdown and abandonment of older low productivity oil wells located on expensive offshore production facilities.

Specifically the following four possible changes are investigated.

1. Eliminate application of the ELF to the current $.80 per barrel tax floor.

2. Change the ELF formula to one similiar to that proposed in HB545 and modified by OMB in which the exponent is modified to raise the tax rate on fields with total field productivity in excess of roughly 100,000 barrels per day and lower the tax rate on fields with production less than this amount.

3. Establish a new severance tax floor at $1.50 not subject to the ELF and index it for inflation.

4. Eliminate the ELF entirely.

These hypothetical changes in the severance tax law are analysed using the Department of Revenue Petroleum Revenue Forecasting Simulation Model. All assumptions concerning oil prices, transportation costs, and market deliveries are the same as were used in preparing the Department's December 1986 forecast of petroleum production revenues.

The simulation model is used because it can show the changes in average expected revenues and oil production due to a change in the tax law over a wide range of price and transportation cost assumptions. Further, since it is the model used to make the official State forecast of severance tax revenues it conveniently illustrates how the current forecast would change if the severance tax law were changed.

As a general principle, any of the changes in the severance tax mentioned above will increase the average expected taxes levied on the oil producers in the State. Since higher taxes make producing oil a more costly enterprise it is likely that in some instances this higher cost will make production unprofitable. In a broad sense then, it would be nice to know the tradeoff between the increased tax revenue to the State and the reduced investment in oil production and consequently reduced tax base due to the increased cost of producing oil.

Such an investigation is possible but since so many assumptions have to be made, the results will always be subject to dispute. As a practical matter oil producing companies are not a homogenous group with respect to risk preference or financial capacity. One has only to look at the companies producing on Alaska's North Slope to appreciate this distinction i.e. Amerada Hess as compared to Exxon. It is also important to stress that the companies are the one's who make the decisions affecting production and any financial model such as the one used in this analysis can only make reasonable assumptions about the parameter values the companies themselves would choose (price, discount rate, or capital outlay). Further this analysis can only examine the relative merits of oil production in the State of Alaska, since we do not have accurate data on oil production prospects globally. Finally this analysis is done without examining the issue of budget constraints which obviously all in the oil business are facing given the current depressed price situation.

There too many unknowns for this analysis to delve in depth into the relative regional economic impact of public expenditure vs.

private expenditure in the State of Alaska so the discussion will be limited to the effect of changes in ELF on State petroleum revenues and barrels of oil and not on whether those changes make sense for the Alaskan economy.

Eliminate the application of the ELF to the cents per barrel tax floor

This would essentially guarantee the State a minimum severance tax payment for every barrel of oil produced in the State (currently $. 80 per barrel). Tables 1 and 2 show the change in average expected revenues and production for each of the North Slope oil fields assumed to be in production between the present and 2005. Fixing the severance tax floor would increase average expected revenues between 1987 and 2005 by $135.42 million in nominal dollar terms or $95.98 million discounted at 8%. The disincentive to produce created by the fixed floor results in a decrease in average expected production of over 19 million barrels of oil. One way of looking at it is that the State gains an average of roughly $7.00 for every barrel of oil production foregone.

Prudhoe Bay production is effected the most by this change in the severance tax. This is primarily because after primary recovery Prudhoe will still have a tremendous amount of oil in the ground which may be recoverable with additional investment. On the other hand Kuparuk and some of the other more marginal fields can be seen to provide the lion's share of the average expected revenue increase. This is because these fields currently have calculated ELF's which are much lower than Prudhoe so that at prices which trigger the cents per barrel tax these fields will experience a relatively larger increase in their tax bill.

Modify the ELF Exponent to Reflect Total Field Production

This proposed change in the ELF is contained in a bill submitted in the Alaska House of Representatives in the Spring of 1986. In

Table 1

Production Impact of Fixed Severance Tax Floor = $.80/bbl
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.04	0	0	0	-.04
1988	-.77	-1.01	-.08	-.08	-.08	0	0	0	-2.02
1989	-.68	-.12	-.11	-.26	-.10	0	0	0	-1.27
1990	-.60	-.12	-.16	-.29	-.13	0	0	0	-1.30
1991	-.56	-.12	-.11	-.31	-.20	0	0	0	-1.30
1992	-.52	-.09	-.11	-.27	-.20	0	0	0	-1.19
1993	-.48	-.09	-.12	-.26	-.24	0	0	0	-1.19
1994	-.45	2.22	-.21	-.19	-.24	0	0	0	1.13
1995	-.40	1.42	-.22	-.11	-.23	0	0	0	.46
1996	-.50	1.18	-.17	-.04	-.26	0	0	0	.21
1997	-.34	-.73	-.11	-.01	-.31	0	0	-2.99	-4.49
1998	-.64	-.72	-.05	.02	-.44	0	0	-1.50	-3.33
1999	-.59	-.49	-.03	.05	-.25	0	0	-.03	-1.34
2000	-.42	-.38	0	.05	-.16	0	0	-.20	-1.11
2001	-.40	-.31	0	.06	-.06	0	0	-.15	-.86
2002	-.02	-.32	0	.05	-.04	-.02	0	-.03	-.38
2003	-.02	-.25	0	.03	-.03	0	0	-.09	-.36
2004	-.01	-.23	0	.03	-.02	-.03	0	-.57	-.83
2005	-.01	-.20	0	.01	-.01	-.02	0	-.02	-.25
Total	-7.41	-.36	-1.48	-1.52	-3.04	-.07	0	-5.58	-19.16

Table 2

Revenue Impact of Fixed Severance Tax Floor = $.80/bbl
(Millions $)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	.10	29.66	1.70	0	.50	0	0	0	31.96
1988	9.50	8.92	.11	1.38	.27	0	0	0	20.18
1989	5.16	5.37	0	2.66	.64	0	0	0	13.83
1990	2.74	3.83	-.03	1.51	.30	0	0	0	8.35
1991	3.35	4.37	-.02	1.45	.58	0	0	0	9.73
1992	2.21	4.14	-.03	.84	.38	0	.01	0	7.55
1993	2.71	3.53	-.03	-.01	.66	0	.02	0	6.88
1994	3.12	19.80	.13	-.05	.96	0	.07	0	24.03
1995	2.70	17.43	.10	-.02	1.02	.09	.03	0	21.35
1996	1.75	15.58	.05	.04	.87	.09	.02	0	18.10
1997	1.34	-1.42	.03	.07	.66	-.01	0	0	.67
1998	.30	-2.50	.03	.09	.34	-.02	-.01	0	-1.77
1999	-.53	-3.17	.05	.14	.22	-.02	0	0	-3.31
2000	-.13	-3.51	.07	.13	.13	-.03	-.01	0	-3.35
2001	.13	-3.76	.06	.13	.13	-.06	-.01	0	-3.38
2002	.05	-3.95	.05	.10	.07	-.13	-.01	0	-3.82
2003	.01	-4.09	.05	.08	.05	-.10	0	0	-4.00
2004	-.07	-3.97	.04	.05	.04	-.14	-.01	0	-4.06
2005	-.08	-3.68	.04	.03	.03	-.16	0	0	-3.82
Total Revenue									
Nominal	34.36	82.58	2.40	8.62	7.85	-.49	.10	0	135.12
10% disc	20.07	57.69	1.63	5.21	3.64	-.06	.05	0	88.24
8% disc	22.15	62.23	1.73	5.71	4.18	-.09	.06	0	95.98

this example the formula specification is the one used in the presentation by Dr. Tom Chester at the Tax Committee's September meeting. The formula used in HB545 raises the tax rate on fields with production in excess of roughly 80,000 barrels per day and lowers the rate for lower production rates. The modification presented by Dr. Chester changes the trigger to roughly 100,000 barrels. The purpose of this change is to increase the effective tax rate over current law for "large oil fields" while at the same time keeping severance taxes from discouraging investment in smaller oil fields. Practically speaking it effectively increases revenues to the State through the impact on the prolific Prudhoe Bay field.

Tables 3 and 4 illustrate the field by field impact on revenue and production of this change in the severance tax law. Average expected revenues through the year 2005 increase $2270.52 million in nominal dollar terms ($1073.67 million discounted at 8%). As might be expected because of the upside potential of the higher effective tax rate on large fields, should oil prices grow over time the large reserves of Prudhoe contribute the most to this revenue increase. Average expected production would decrease by 28.41 million barrels under this tax regime. Once again the disincentive to produce additional barrels from the large Prudhoe Bay field accounts for the largest share of estimated production decrease. However because the tax burden is lowered for some fields, West Sak and Seal Island actually show greater average expected production. This ELF alternative increases State revenues by roughly $80 for every barrel of oil production foregone.

<u>Establish a New Severance Tax Floor at $1.50 Not Subject to the ELF and Index it for Inflation.</u>

Tables 5 and 6 show the field by field effect of this alternative on average expected production and average expected revenues. Indexing the severance tax floor from a $1.50 base results in an increase of revenues of $1797.17 million through 2005 in nominal dollar terms ($1195.04 discounted at 8 percent). This alternative has a devastating impact on average expected

Table 3

Production Impact of OMB Altered Exponent
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.01	-.01	0	0	-.02
1988	-.71	-.05	0	-.02	-.01	0	0	0	-.79
1989	-.63	-.12	0	-.04	-.01	0	0	0	-.8
1990	-.57	-.12	-.01	-.04	-.01	0	0	0	-.75
1991	-.55	-.11	-.01	-.05	-.02	0	0	0	-.74
1992	-.47	-.09	-.01	-.07	-.02	0	-.13	0	-.79
1993	-.45	.09	-.02	-.07	-.03	0	-.23	0	-.71
1994	-2	.23	-.43	-.06	-1.31	0	-.24	0	-3.81
1995	-1.73	.17	-.35	-.06	-1.09	.79	-.3	0	-2.57
1996	-2.37	.15	-.28	-.05	-.9	.72	-.31	0	-3.04
1997	-3.05	-.33	.05	-.05	-.86	.77	-.29	2.99	-.77
1998	-3.19	-.2	.04	-.04	-.68	.7	-.24	1.4	-2.21
1999	-2.72	-.21	.05	-.04	-.57	.62	-.32	-.09	-3.28
2000	-2.18	-.16	.05	-.03	-.49	.61	-.26	.01	-2.45
2001	-2.04	-.13	.06	-.02	-.39	.61	-.2	.05	-2.06
2002	-1.62	-.09	.05	-.02	-.28	.77	-.17	-.07	-1.43
2003	-1.32	-.07	.03	-.01	-.22	.81	-.09	-.03	-.9
2004	-1.06	-.09	.03	-.02	-.2	.73	-.06	.45	-.22
2005	-1.17	-.08	.02	-.01	-.15	.48	-.03	-.13	-1.07
Total	-27.83	-1.21	-.73	-.7	-7.25	7.6	-2.87	4.58	-28.41

Table 4

Revenue Impact of OMB Altered Exponent
(Millions $)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	5.94	29.29	-.35	0	-3.35	0	0	0	31.53
1988	93.85	38.51	-.7	-2.18	-5.84	0	0	0	123.64
1989	106.32	49.2	-1.92	1.06	-4.8	0	0	0	149.86
1990	114.56	55.31	-2.31	1.08	-5.18	0	0	0	163.46
1991	117.43	40.61	-2.38	1.14	-1.45	0	0	0	155.35
1992	121.4	21.83	-3.43	1.26	-1.61	0	-2.76	0	136.69
1993	124.53	17.32	-4.07	1.71	2.49	0	-3.42	0	138.56
1994	124.27	14.59	-7.22	-3.66	8.69	0	-3.35	0	133.32
1995	122.99	11.42	-7.32	-2.74	6	2.56	-3.53	0	129.38
1996	121.97	5.22	-7.15	-5.63	.76	5.32	-3.83	0	116.66
1997	121.16	2.47	-4.86	-6.91	1.21	15.03	-5.19	0	122.91
1998	123.22	-2.01	-4.39	-6.67	-6.63	17.42	-5.89	-2.87	112.18
1999	123.31	-5.48	-3.66	-5.19	-13.47	20.38	-6.2	-1.7	107.99
2000	123.55	-8.42	-2.85	-3.65	-17.84	27.9	-8.1	-1.26	109.33
2001	118.02	-9.7	-1.81	-2.21	-18.53	31.67	-8.17	-2.3	106.97
2002	112.28	-7.83	-1.49	-1.19	-16.1	41.71	-8.97	-2.37	116.04
2003	106.24	-5.79	-.61	-.45	-12.2	46.2	-10.48	-3.11	119.80
2004	99.26	-4.25	-.2	-.02	-7.99	34.3	-10.51	-4.04	106.55
2005	91.89	-3.1	.17	.06	-5.27	17.56	-9.72	-1.29	90.30
Total Revenue									
Nominal	2072.19	239.19	-56.55	-34.19	-101.11	260.05	-90.12	-18.94	2270.52
10% disc	781.96	166.60	-22.23	-9.90	-28.72	56.40	-22.67	-3.96	917.48
8% disc	927.72	179.68	-26.39	-12.54	-35.58	75.37	-29.26	-5.33	1073.67

Table 5

Production Impact of Indexed Fixed Floor
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.21	0	0	0	-.21
1988	-15.79	-2.93	-.32	-.69	-.44	0	0	0	-20.17
1989	-14.15	-2.4	-.45	-2.18	-.61	0	0	0	-19.79
1990	-12.48	-2.4	-.49	-1.97	-.79	0	0	0	-18.13
1991	-11.77	-2.17	-.44	-1.87	-1.18	0	0	0	-17.43
1992	-10.74	-1.9	-.44	-1.84	-1.18	0	.25	0	-15.85
1993	-9.35	1.68	-.45	-1.86	-1.42	0	.43	0	-10.97
1994	-8.24	-.77	-.47	-1.34	-1.44	0	.42	0	-11.84
1995	-7.15	.04	-.51	1.09	-1.43	.06	.46	0	-7.44
1996	-7.23	.1	-.45	.82	-1.45	.03	.49	0	-7.69
1997	-6.87	-1.95	-.29	.63	-1.64	0	.5	2.99	-6.63
1998	-5.93	-1.65	-.27	.47	-1.28	-.01	.52	1.5	-6.65
1999	-5.46	-1.02	-.31	.37	-.79	-.04	.54	.03	-6.68
2000	-4.12	-.93	-.21	.36	-.57	-.04	.43	.2	-4.88
2001	-3.43	-.91	-.18	.35	-.37	-.06	.36	.15	-4.09
2002	-1.93	-.79	-.08	.08	-.23	.02	.32	.03	-2.58
2003	-1.84	-.91	-.04	-.02	-.25	.03	.27	.09	-2.67
2004	-2.12	-.94	0	-.02	-.32	.06	.2	.57	-2.57
2005	-1.88	-.67	0	-.01	-.36	.06	.16	.02	-2.68
Total	-130.18	-20.52	-5.4	-7.63	-15.96	.11	5.35	5.58	-168.95

Table 6

Revenue Impact of Fixed Indexed Floor
(Millions $)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	223.91	80.84	5.87	0	2.27	0	0	0	312.89
1988	180.5	58.65	2.31	8.56	7.33	0	0	0	257.25
1989	109.65	44.29	6.21	32.07	14.94	0	0	0	207.16
1990	77.65	37.84	7.34	32.63	16.36	0	0	0	171.82
1991	76.29	36.51	7.13	34.7	26.88	0	0	0	181.51
1992	55.19	30.8	5.4	33.15	25.8	0	4.68	0	155.02
1993	43.17	24.46	5.27	23.42	29.17	0	5.72	0	131.21
1994	34.04	36.88	4.44	17.49	27.57	0	4.36	0	124.78
1995	24.57	30.63	3.56	13.49	25.57	5.28	3.4	0	106.50
1996	15.6	25.97	2.67	9.99	22.87	5.05	2.43	0	84.58
1997	10.22	6.09	2.04	7.53	20.46	5.51	0	0	51.85
1998	1.43	2.25	1.39	5.39	14.16	3.78	-.71	.07	27.76
1999	-2.09	.32	.8	3.76	10.22	2.46	-1.18	.04	14.33
2000	-1.79	-1.03	.42	2.2	7.62	.98	-.92	.04	7.52
2001	-1.61	-2.26	.02	-.1	5.84	.86	-.87	.02	1.90
2002	-2.19	-3.08	-.05	-.15	4.29	.39	-.98	.01	-1.76
2003	-5.34	-4.78	-.07	.1	2.71	.2	-.95	0	-8.13
2004	-8.9	-5.29	.03	.07	.61	.01	-.76	-.01	-14.24
2005	-8.95	-4.84	.05	.04	-.33	-.12	-.63	0	-14.78
Total Revenue									
Nominal	821.35	394.25	54.73	224.34	264.34	24.4	13.59	.17	1797.17
10% disc	562.83	247.88	30.11	117.70	117.13	7.82	7.57	.05	1091.10
8% disc	604.33	270.22	33.57	132.65	135.90	9.72	8.60	.06	1195.04

production which is reduced by nearly 179 million barrels. This impact on production is a direct result of the increased liklihood that such a tax would cause a premature shutdown in the already producing oil fields or would make additional investment uneconomic. This alternative has a most dramatic effect on Prudhoe Bay production because it significantly increases the probability that Prudhoe Bay shuts down prematurely. As will be seen, eliminating the ELF entirely results in much greater expected revenue without as severe an effect on production. This is because with the percent of value tax the State shares in the high oil price value cases and also shares the loss in the low oil price case (down to the current $.20/bbl floor). The fixed indexed floor fails to reflect the relative change in profitability of falling oil prices. The indexed floor increases State revenue by roughly $10 for every barrel of production foregone.

Eliminate the ELF Entirely

This alternative would remove entirely the severance tax relief given to low productive oil wells.

Tables 7 and 8 show the revenue and production effect on a field by field basis. Total average expected revenues through the year 2005 increase by $5082.43 million, $2111.87 million discounted at 8 percent, while average expected production falls by 84.67 million barrels. Prudhoe Bay because it dominates North Slope production over the next ten years accounts for over half of the increased revenue. Kuparuk one of North America's largest fields because its current ELF is roughly .6 accounts for the largest relative increase.

Prudhoe Bay with its large reserves accounts for a 28 million barrels of the production loss, while the West Sak field with its relatively low productive high cost wells accounts for another 21 million barrels of the average expected decline in production. Eliminating the ELF increases State revenue by roughly $49 for every barrel of oil production foregone.

Table 7

Production Impact of Eliminating the ELF
(Millions Bbls.)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	-.05	0	0	0	-.05
1988	-1.1	-1.01	-.08	-.15	-.09	0	0	0	-2.43
1989	-.96	-.18	-.11	-.51	-.12	0	0	0	-1.88
1990	-.85	-.18	-.16	-.55	-.15	0	0	0	-1.89
1991	-.8	-.17	-.12	-.58	-.22	0	0	0	-1.89
1992	-.72	-.14	-.12	-.6	-.22	0	-.3	0	-2.1
1993	-.67	-.13	-.13	-.62	-.27	0	-.5	0	-2.32
1994	-1.19	-.52	-.67	-.49	-4.76	0	-.5	0	-8.13
1995	-.99	-.87	-.61	-2.49	-3.9	-1.41	-.55	0	-10.82
1996	-3.2	-.73	-.5	-1.98	-3.23	-1.71	-.57	0	-11.92
1997	-2.97	-.8	-.14	-1.56	-.48	-2.13	-.58	-2.99	-11.65
1998	-2.65	-.7	-.08	-.19	-.44	-1.97	-.6	-1.92	-8.55
1999	-1.63	-.47	-.09	-.07	-.2	-1.69	-1.75	-.64	-6.54
2000	-.79	-.39	-.08	-.16	-.09	-1.55	-1.45	-.74	-5.25
2001	-1.01	-.37	-.1	-.21	.06	-1.3	-1.23	-.69	-4.85
2002	-1.75	-.39	-.08	-.1	.19	-2.93	-.34	-.55	-5.95
2003	-2.61	-.5	-.06	-.02	.17	-2.63	-.27	-.62	-6.54
2004	-2.15	-.64	-.03	.01	.05	-2.49	-.2	-1.06	-6.51
2005	-2.04	-.58	-.05	-.08	-.06	-1.15	-.14	-.8	-4.9
Total	-28.08	-8.77	-3.21	-10.35	-13.81	-20.96	-8.98	-10.01	-104.17

Table 8

Revenue Impact of Eliminating the ELF
(Millions $)

Year	Prudhoe	Kuparuk	Milne	Endicott	Lisburne	West Sak	Pt. Thomson	Seal Island	Total North Slope
1986	0	0	0	0	0	0	0	0	0
1987	5.76	30.42	2.03	0	.58	0	0	0	38.79
1988	100.15	38.53	1.17	3.19	.57	0	0	0	143.91
1989	114.81	49.32	3.08	13.28	7.21	0	0	0	187.7
1990	125.23	55.31	3.9	14.88	13.53	0	0	0	212.85
1991	129.21	56.02	4.01	15.87	21.39	0	0	0	226.5
1992	134.94	59.97	5.59	17.84	23.66	0	3.2	0	245.2
1993	110.42	59.92	6.48	24.57	33.16	0	4.07	0	268.62
1994	148.74	62.93	3.18	24.04	3.76	0	3.93	0	246.58
1995	148.9	59.93	2.92	9.4	13.16	10.7	4.29	0	249.3
1996	152.12	63.71	2.91	11.01	21.54	14.22	4.86	0	270.37
1997	162.67	60.9	5.07	11.81	46.78	28.35	6.7	0	322.28
1998	167.04	60.34	4.95	22.4	47.85	33.54	7.66	-2.04	341.74
1999	169.48	58.82	4.63	22.23	47.02	39.63	-6.57	3.12	338.36
2000	171.87	57.33	4.11	20.46	46.3	55.66	-2.08	4.45	358.1
2001	167.58	54.07	3.56	15.26	45.39	64.29	2.72	5.41	358.28
2002	163.87	50.23	3.11	11.19	44.26	48.56	14.08	6.66	341.96
2003	159.23	30.89	2.54	10.03	41.89	60.19	13.48	9.99	328.24
2004	154.36	19.41	1.87	7.3	37.3	72.01	13.56	11.64	317.45
2005	147.21	12.71	.32	4.91	33.15	67.92	13.51	6.47	286.2
Total Revenue									
Nominal	2663.89	940.76	65.43	259.67	528.5	495.07	83.41	45.7	5082.43
10% disc	948.54	383.01	26.18	98.23	157.56	107.91	20.72	8.45	1750.61
8% disc	1137.24	448.57	30.79	116.89	196.10	143.89	26.70	11.68	2111.87

Summary and Analysis

All four of the proposed changes in the severance tax result on average in increased State revenues. Average expected oil production, however, is lower due to the negative impact of potentially higher taxes on expected profitability.

The effect of each of these proposed changes is analysed using the Monte Carlo simulation model. This type of model evaluates many possible combinations of variables effecting oil production revenues including high prices where taxes are not so important in determining development feasibility and low prices where taxes may be an important consideration in deciding whether or not a project is viable. The output of the model is determined not only by the scenarios of the prices and costs and quantities entered as input into the model but also by the probability assigned to each scenario. The model results, in this case State petroleum production revenue by year to the year 2005, are depicted as the probability distribution of possible outcome. Another way of looking at the output is to say many possible outcomes are evaluated and this is what to expect on average will occur. The analysis of these changes in severance tax law is of course only as good as the input into this model. Department of Revenue analysts have weighted the inputs into the model which may or may not correspond to the way in which the different producing oil companies would weight them. Further the feasibility part of the model uses a hurdle rate 8% real and assumes no budget constraints and no competing global investment alternatives. Those caveats aside the results of this analysis are summarized as follows.

1. Fixing the severance tax floor at $0.80 per barrel has the least impact on expected State revenues and has the least negative impact on expected North Slope production.

2. Eliminating the ELF entirely, generates the largest average expected increase in State revenue.

3. Increasing the fixed floor to $1.50 and indexing it to account for inflation has the greatest negative effect on average expected production.

4. Because the real upside potential for State revenue continues to depend on the share of the value of Prudhoe Bay production taken by the State, modifying the ELF to reflect total field productivity is the most efficient alternative in terms of dollars gained for every barrel foregone ($80 per barrel as opposed to $7 per barrel for the fixed $.80 per barrel ELF alternative). This is because this tax increases revenues while at the same time mitigating the negative effect on average expected production. The ranking of ELF alternatives using this type of revenue maximizing criteria is as follows.

1) Modified Exponent ELF	$80/bbl
2) Eliminate ELF	$49/bbl
3) Indexed Floor	$10/bbl
4) Fixed $.80/bbl Floor	$7/bbl

5. The production disincentives are generally associated with development of the so called marginal fields, and enhanced recovery investment in Prudhoe Bay and Kuparuk although in some very low price cases no doubt potentially higher taxes cause even these already producing fields to be shut-in.

The above analysis says nothing about the impact of any of these hypothetical tax changes on Cook Inlet. Currently Cook Inlet production is roughly 50 thousand barrels per day. Because much of current production is from a large number of wells with average daily production less 300 barrels, the ELF under current law is zero or nearly zero for most oil producing leases. As a result FY 1986 oil severance collections are estimated to be less than $2 million or roughly $.12 per barrel. If a minimum tax of $.80 per barrel were levied, assuming no fields were abandoned,

severance taxes would increase to $12.78 million. Although there is a considerable difference in terms of well productivity and profitability among the Cook Inlet fields, given the economics of field abandonment it is likely that the bulk of production would continue even with higher taxes burden. On the other hand additional investment in further production would no doubt be much much lower than it would be under the current tax regime. It may be important to note that Cook Inlet oil production is an integral part of the regional economic base on the Kenai Pennisula. Eliminating the ELF would probably shutin Cook Inlet production. The modified exponent ELF would have no negative impact on Cook Inlet because all these fields produce much less than 100,000 bbls/day.

TRANSCRIPT OF PRESENTATION ON ELF
given by Gregg Erickson
TAX POLICY COMMITTEE MEETING - September 11, 1986

TAPE 2, SIDE 1, COUNTER #238

The ELF was established in 1977 and as Mr. Monkman told you, the ELF is a tax break. The purpose of the ELF as it was established in 1977 was to reduce the tax rate. Oil producers like the ELF. Any proposal to [increase] the ELF is [not] going to win favor with the oil producers and give them more money, allow them to keep more of the proceeds of the production of oil than they keep now.

The ELF can reduce the tax rate by a lot or it can reduce the tax rate by a little depending on one major factor. And that is the average per well productivity. If the average well in a field produces 300 B per day, that field will pay a lower tax rate under the ELF, other things being equal, than if the average per well productivity in the field is 1000 B per day. The average per well productivity is always the major factor in establishing the ELF and it needs to be kept in mind. We'll be coming back to that again later.

The ELF is always a number, and the number is always between zero and one. If you like, you can think of the ELF as a percentage that's applied to the regular nominal percentage tax rate. That's another important concept.... Right now, Alaska has a nominal percentage severance tax rate of 15% for some fields and 12.25% for some fields, and some fields change around from 15 to 12.25% because of amendments to the severance tax law that were adopted in 1981 and we'll talk about those later. That nominal tax rate gets reduced by the ELF by multiplication of this number (between zero and one, remember) times the nominal percentage rate. So, if the ELF is .5 (one-half) then the nominal tax rate is reduced by a half. So, [if] the ELF is .5 and our nominal percentage rate is 15%, the effective percentage rate is half of 15%, or 7.5%. Oil companies like the ELF, it reduces their tax rate.

I think that we can understand how this works best now by taking you to the never-never land of charts and graphs.(*) I know that it's a hard thing for some people to grasp the kind of geometric concepts we are going to be dealing with, so, Mr. Chairman, if it's alright with you, I'd be appreciative if people would interrupt me and say that they don't understand a particular concept that I'm trying to get across.

This is a picture of the Economic Limit Factor. Start out by looking at the two axes here, the two lines. The lower axis right here is...daily output per well. [It] starts out here at 50, but you can imagine it going even further down here, to zero. That means 50 B of oil per day, per well. It goes way on up here to 2500, 2800 B per day per well. The other axis on this chart is the ELF. And as I told you before, if you recall, it's a number between zero and one. [Y]ou see those numbers here, starting at 0 at the bottom, .5 in the middle and 1 at the top. If you have an oil field and the ELF is 1.0, you get no tax reduction because your nominal tax rate is multiplied times 1 which means it's not changed at all. If your ELF is .5, it's multiplied by one-half, it means you pay half of the nominal tax rate. If your ELF is 0, you pay no tax at all. Oil companies like the ELF.

You notice that fields have different average daily production, some fields have very high productivity in comparison to others. Prudhoe Bay field has, or had, because this graph was originally made about nine months ago, an average

(* Refer to charts attached to transcript.)

daily productivity as calculated for the ELF of around 2500 B per day per well. Milne Point, on the other hand, has a lower productivity and Kuparuk has a lower productivity still. If we applied the ELF in exactly the same manner to Prudhoe Bay, to Milne Point, and Kuparuk, it affects them differently. Prudhoe Bay, because it has the highest productivity, gets the least tax break. Kuparuk, because it has the lowest per well productivity, gets the biggest tax break from the ELF. And if we had a field down in this region, it would get an even bigger tax break from the ELF.

Now we say that the ELF is a function. [T]hat means it depends on the daily output per well. That means that if you know the daily output per well you can, or at least you have been able to in the past, determine what the ELF is going to be, what number between zero and one gets multiplied times that nominal tax rate to produce the effective tax rate, which is what Mr. Nelson and his oil company people are really concerned about, the effective tax rate. And it's really what the State of Alaska is concerned about too. In terms of all the factors that we're concerned about on severance taxes, it's the effective rate that people have to pay that makes the difference, not whether the nominal rate is 15% or 30% or 2%.

Now, you'll notice that this curve has a shape that puts every point out here as we move to the right along this lower axis, we also move at every point up on the fractions of the ELF axis. Except for this region down here at the bottom, we'll be coming back to this as we calculate the ELF, but that region is the economic limit region.

The framers of the legislation in 1977, that christened the ELF, that created the ELF, decided that they wanted to insure that fields of relatively low productivity such as they expected to develop among the Cook Inlet fields at that time, would not be forced to shut down before the cost of [operating] the fields exceeded the value of the oil that was being produced. And there was a problem that Milton Lipton and many others spoke to the Legislature about and they called it the premature shut-down effect. If you had too high a tax burden at these low productivity, and presumably low profitability fields,...those fields would shut down, even though they could continue to make profits if the taxes were reduced and continue to make, at least if not profits, at least enough money to bear their operating costs and to keep the jobs and keep the economic activity represented by those fields. Economist and experts and business people alike agreed that it didn't make much sense to shut a field down before the actual cost of production exceeded the value of the oil. Taxes, and royalties too, were dead weight that had to be carried by the production of those fields and so this device was created to, at least as far as the severance tax is concerned, eliminate that dead weight drag on those fields that might otherwise shut [them] down.

We'll come back to that concept so it's not necessary that everybody grasp that in its entirety. But, I'd like to stop right now while we've got this graph in front of us and ask any member of the committee, with your permission, Mr. Chairman, if they have any questions or if there's anything I've covered so far that doesn't compute.

COUNTER #377

(QUESTION from Sen. Eliason: Just a general question, the lower level of production, there, and in fact what they're paying is only 7½% or is it the 15%, is that what we're saying.)

We're saying that Prudhoe Bay, under these assumptions, which are a little bit out of date right now, is paying 83% of, in the case of Prudhoe Bay, 15%. And Tom Chester, our expert, or maybe Mr. Nelson who probably knows a lot about Prudhoe Bay too, can give you the exact number.

(QUESTION from Sen. Eliason: The question of course, or the point was, in other words, that's the 7½%, that low production field is paying 7½% rather than the 15.)

If the nominal rate on Kuparuk was 15% that would be true. However, the nominal rate on Kuparuk is, if I am correct, 12.25%. [They're] paying half of that, that's correct.

(COMMENT from George Nelson: I want to make one correction because in Prudhoe Bay we're paying, based on one, 15% simply because of the fact that for the first ten years, by the law, the factor cannot, if it calculates out above .7, it's always going to be 1. So it's July 1987 before Prudhoe Bay can really use ELF to the advantage of reducing that percent.)

Mr. Nelson is absolutely correct. The reason, and I'm sorry I gave the misrepresentation if I did, that Prudhoe Bay's actual tax rate was reflected by this calculation, because as he says, there's a special exception in the law for Prudhoe Bay which was established in the 1981 tax amendments. But, the ELF by itself works this way, and if the ELF applies, which it does not right now to Prudhoe Bay, Prudhoe Bay would be paying 83% of whatever its nominal rate would be.

(QUESTION from Rep. Grussendorf: The ELF is based on the output per well, or site. What are advantages or disadvantages if we went by field?)

The output per well was chosen, it's my opinion anyhow, that in 1977, it was chosen by the legislature as the factor to determine the ELF because they believed that that was the most readily measurable indicator of field profitability and they wanted to have lower taxes for fields that had lower profits and higher taxes for fields that had a higher profit. But they wanted to retain the concept of a severance tax, as Mr. Monkman mentioned to you. They didn't want to create an income tax here and call it a severance tax, although, they in effect got a little bit close to that perhaps at times.

They chose this one factor recognizing, I think, that there were a lot of other factors that affect profits as well. And for example, we have here Kuparuk, which may well be a more profitable field than Milne Point, and yet the Milne Point has a very small number of relatively high productivity wells, or at least was anticipated to have that situation. And Kuparuk has a relatively larger number of lower productivity wells. As a consequence, Kuparuk gets a bigger tax break than Milne Point. That shows in effect, the arbitrariness, if you will, of just using daily output per well as the indicator of relative profitability. Because if the situation I just described is true, if Kuparuk is a more profitable field than Milne Point, then this ELF factor has not produced the results that I think the framers of the legislation in 1977 wanted to produce. And it might well be that that problem is a consequence of the failure of this ELF factor to reflect total field size. [T]here are a number of factors, indeed, besides daily output per well and total field size, that could be taken account of in an ELF kind of calculation. And the framers chose daily output per well.

(QUESTION from Rep. Sund: How is the curve generated?)

We're going to take you all through that, in excruciating detail, I'm afraid.

(QUESTION from Sen. Eliason: Could also the ELF be construed as an incentive to put more wells in a field?)

Indeed, it could be. However, there are technical provisions in the law which say that you really don't look at number of wells, you look at the number of days that a well operates multiplied. So, it's really well days that are used to try to prevent the incentive, or eliminate any incentive for gold-plating or over-drilling a field. Now, I don't know that any studies have been made to indicate whether or not there is any residual incentive or not. My

suspicion is that its minor if it is. You'll see those technical provisions when we go through the actual translation of the ELF which is coming next.

(QUESTION from Bart Garber: On your graph, the figures on the bottom line, those are constants for the formula, they don't ever change?)

The figures on the bottom line change for every field, from day to day.

(QUESTION from Bart Garber: No, I understand that, what I'm saying is as far as the formula itself goes, to determine the ELF rate, the number of barrels pumped per well don't change?)

[I don't] know if I understand your question correctly. Let me rephrase it and tell me if I'm getting back to you. Does a well this year pumping at 1300/bbl per day get exactly the same ELF this year as it will five years from now if the law doesn't change?

(QUESTION from Bart Garber: No, that's not what I meant. My question is are those figures constant there. Will you always use those figures. In other words, if a well is pumping at 1300/bbl daily output per day, I'm not saying will that well remain constant, I'm saying will that figure remain constant at wherever you're at on ELF?)

Like at .7. If you'd asked me that question last year, or 13-14 months ago, I would have said yes, absolutely. But, I would have been wrong because, as Mr. Monkman mentioned, there is a provision in the law which [was never] really thought [much about], to change this production-at-the-economic-limit number. You'll see how that enters into it later on. And it's nobody's fault but my own that I would have misanswered your question, but I think there were a lot people who would have made the same mistake a year and a half ago.

(QUESTION from Gordon Harrison: I see a question, Gregg, to follow up on, Sen. Eliason's question about the number of wells. Is well spacing regulated, the number of wells that is, by the Oil and Gas Conservation Commission?)

Yes it is. Indeed, the Alaska Oil and Gas Conservation Commission establishes regulations and when the oil companies wish to change the average spacing, they need to get permission. However, the Commission grants or withholds that permission based on generally a reference to engineering practice rather than economic analysis. Or at least that is to my understanding.

COUNTER #523

(QUESTION from Rep. Grussendorf: Gregg, that was the concept of the formula?)

We go from the general, and that can be called general, to the formula itself. Now folks, don't automatically assume that you can't figure this out. This is the formula, the ELF here equals this mathematical construction. We're going to take you through this mathematical construction and it's not nearly as complicated as it seems. The only thing that you may find unfamiliar, and I think most of you will have had some familiarity with it, is the use of the exponent. This little 'exp' in the formula means that the expression following it is, taken together, an exponent. If you recall what any...exponent says, you raise the number to a power, and if the exponent is two, that means you multiply the number by itself. So, four squared ([a four] with a little two above it] means four times four, and that's all we're doing here, but a little more complex than that because we use fractional exponents. But, that's the principle.

The formula has in it abbreviations because if you wrote the whole thing out it would just be too long. And one of those abbreviations, the first one,... ELF,...is an abbreviation [that] stands for Economic Limit Factor. The second abbreviation is PEL. It stands for Production at the Economic Limit. Now you recall the graph we showed you just a moment ago, had a zero tax rate at [an] average daily per well production of from zero to 300 B. The concept

behind that was that it would probably take about, it's a real rough and arbitrary kind of number, but nevertheless, take about 300 B a day for an average well in the average field to make its expenses. Now there's all sorts of things that vary. [O]bviously the cost of the well can vary enormously. [A]s we've discovered, the amount of money you get from the oil can vary enormously, and all these affect how many barrels you have to produce to just cover your operating expenses. Incidentally, the operating expenses in the statute were defined very, very narrowly. But, as a rough approximation...the law says you will take 300 B unless a showing is made otherwise. And up to now, everyone has calculated their ELF using 300 B, so we use it here today in our calculation. [I]t's defined in the law as times the number of wells and times the number of days the well is operating, actually defined as well days. So that the production at the economic limit for this month for this hypothetical field which is similar to Prudhoe Bay,...would be 4,869,000 B. The concept there is that if the Prudhoe Bay owners could get 4,869,000 barrels [per month], they would at least make their expenses. So we plug that number, 4,869,000, into the formula at this point, and at the bottom down here....

The second factor in the formula is the total production for the field for the month. Since we're talking about 300 B per day, and yet the tax gets paid on a monthly basis, we have to calculate in the total number of barrels in the field per the whole month. And that's just simply the monthly production, but we've also shown it here as the result of multiplying the average number of operating wells during the month times the number of days of production for the month times the average daily production per well. And in the example here, we show 541 wells, assuming each of them operated for 30 days, and the average per well productivity was 2,477 B per well, that means they actually produced forty million barrels in that month. So, they actually produced, if this example is correct, roughly 20-25 times as much oil as is necessary under this very rough calculation to meet their operating expenses that we calculated up here in this calculation.... Remember this may not actually be enough to meet their operating expenses, or maybe much more. [It's] what the statute says you use, and I'm explaining not anything that's in the statute when I say operating expenses, but the concept. Well, actually it is in the statute elsewhere, but it's the concept here that we're talking about.

Then we have to plug in the number of well days in the exponent, and that's calculated simply as the number of operating wells during the month times the number of days each well operates. For example, in our case here,...541 wells [times] thirty days gives us [about] 16,000 well days.

Now we come to the calculation. But let me stop right here and talk about these definitions.... Does anybody have anything that they don't understand about these definitions so far?

END OF TAPE 2, SIDE 1, COUNTER #638

TAPE 2, SIDE 2, COUNTER #001

(Beginning of tape unintelligible.)

...show us that it should be more. Up to now, it has been 300 B a day because the operators have either not come in, or if they have, have not satisfied the requirements that they satisfy.

(QUESTION from Sen. Abood: Where do the numbers (tape unintelligible) to break even?)

Three hundred. It's in the statute itself. It says "it shall be presumed to be 300/bbl per day per well, unless..." etc.

(QUESTION from Rep. Martin: Is it possible to look at this formula as a disincentive for oil production. To me, the more they produce, the more tax burden that they have. In a way, it may be worthwhile for production companies

to say let's keep it at a certain level, and therefore we know that our tax factor will be decreased.)

That's entirely possible. The formula is based, however, on the assumption that these more productive fields are more profitable. Now if that assumption doesn't hold or the higher profits are not more than enough to counterbalance the higher taxes, then your supposition could be correct.

(QUESTION from Rep. Martin: Especially at the lower price market, I can see where they want to produce as much as they want at the high prices, because they get more and more percentage of the profit. But in this flexibility we have now, what's to say that a company won't say hey, now it's our turn to pay less taxes and get more profit at the lower price market?)

Well, if I was an oil company, I [c]ould certainly say that.

Now, we have to go and plug these numbers in where...these acronyms [were]. Let's go back up and look at the formula again one more time.

* * * *

[There are] two parts to the ELF formula: the exponent, which is everything within these parentheses starting here and going over to here, and the inverse function, which is everything within these parentheses starting here and going over to here.

In calculating, let's go through the inverse function first. We plug in the PEL right here, the Production at the Economic Limit, which we calculated up here, and that's 4,800,000 some barrels. We plug in the Total Production here, and that's 40 million, and we divide 40 million into 4,800,000. Now, 4,800,000 is a lot smaller number that 40 million, so the result is less than 1. It's a fraction and in this case it's .12, a little over 1/10th. After we make this division, we plug that number in right there.

Now the formula says that you take that little fraction and subtract it from 1. So we do that here, and we get the result of .8789. Now if there was no exponent, that would be the ELF. And indeed, as you will see, as we go back over the history of the 1977 session, that as originally proposed...was all there was to the ELF, was just that calculation we just made. And if that had been the case, and the ELF applied to this particular field, then the nominal tax rate would be multiplied times .8789 to produce the effective tax rate. The effective tax rate would be 88 percent, roughly, [of] the nominal rate. But for reasons that we'll come back to later, the exponent got added.

The exponent is calculated by a constant here, which is 460 (that's a dimensionless constant, it's in the formula, it's in the statute, it's plugged into anything you do with the ELF under this current law) times the number of well days, and that's 16,230, so we plug that in right there, times the PEL, which we calculated up here as some 4,800,000. We can multiply or divide these in any order we want. And [when] we do that,...divide the 16,000 by the formula, and you get a very small number, and you multiply it by 460, it gets large enough so it's always generally over 1. And the results here, if you'd want to take a calculator and do it, multiply 460 times 16,000, and divide the results by some 4,800,000, you get this number. Let me stop right there and see if people have followed me so far.

COUNTER #59

(QUESTION from Rep. Sund: Where does the 460 come in and what's the theory behind it?)

I'd like to defer that until we get into the discussions in the free conference committee in 1977, because I think that's the easiest place to bring that in, but I'll tell you right now that it was a means of...changing the shape of this curve, and it was a means basically of pushing this curve this way. We'll get back to that.

So we've got now this inverse function which has been reduced down to .87, and if it wasn't for the exponent, that would be the ELF, and we've got this exponent. Now normally, this exponent is written just a little bit above the number to which it applies, but because the exponent is so large, we use this different notation, this 'exp'. And if you look in the statute, 43.55, you will find that formula just exactly as we've written it here. The number comes out to 1.5 and probably most of you are not familiar with raising a number to a fractional power, but you can think of it like this. Suppose this exponent was 2, that would look a lot more familiar. It would say .87 squared, with a little tiny 2 right above here and that would be the same thing as we've got written here, except with this being a 2 instead of a 1.5.

Well now what happens when you multiply, usually you think when you square a number it gets bigger, like 4 squared, raised to the second power is 16, that's a bigger number than 4. Now if the number being raised to the power is less than 1 however, you're multiplying a fraction times a fraction and when you multiply a fraction times a fraction you get a number that is smaller. And, in fact, if you multiplied, if the number here was just .8, and the exponent here was 2, you would be multiplying 8 times 8, which is 64, which would make this number here not 64, but .64. In other words, it would reduce it. And that's indeed what happens here. Because this exponent is greater than one, and so if the exponent was one, it would have no effect on this number, and if it was smaller than this number it would make it bigger. But we don't have to worry about that. Basically, if you've got a calculator, plug it in and press the exponent button and it will do it for you.

The result of raising .8789 to the 1.5 power is .82. It's higher than it would be if we were raising .8 to, squaring it, and you can see how that relationship goes, I hope. This is the one part that involves mathematics that most people probably aren't familiar with, but fortunately we have calculators now [so] we [don't] have to be familiar with it.

Does anybody have any questions about the basic calculation about the ELF.

Okay, what happens when we change some of these numbers. Well I ran through three examples here just to show you quickly the results of some adjustments to this ELF calculation. [I]n this case we've increased the exponential constant. It was 460, [and] it is 460 in the statute. What if that number were 1000. Well, we've run through here, and I won't take you through it at any length because you have in front of you the printed copy of this. I've highlighted with bold numbers every number that has changed from our previous example. This number is changed, this number is changed, and this number is changed.

The result of an increase in the exponential constant is a decrease in the tax. The exponent gets larger, you take a larger exponent and apply it to the same basic ELF and the result is a smaller number. Like raising a number to the third power instead of to the second power. So, just to go over it again, if the exponential constant is increased, the tax gets decreased, and in 1977, as you'll see, this was one of things that the free conference committee which met for almost two weeks argued and argued and argued about.

COUNTER #119

(QUESTION from Sen. Abood: Was that where your 460 came in?)

The 460 was the number that previously took the place of 1000. Yes, the answer to your question is yes.

(QUESTION from Sen. Abood: I understand that. In the free conference they argued this 1000 to 460?)

Well, 1000 wasn't one of their options, but they argued the difference between 750 and 300.

(QUESTION from Sen. Abood: This was an arbitrary figure that they were trying to work out?)

They wanted this curve, as you'll see, to look the way they wanted it to. And that number, this 1000 or 460 or 300, makes a significant difference on how that curve looks and who gets hit with a tax jab and who doesn't.

(COMMENT from Sen. Abood: So more is less.)

In this case, more is less. An increase in the exponential constant means a decrease in the tax. And you may not be surprised to learn that the Senate, in 1977, wanted a bigger exponent and the House wanted a smaller one.

(COMMENT from Sen. Abood: I wasn't there at the time.)

(QUESTION from Sen. Eliason: Do you have the names of the free conference committee members?)

I certainly do. (Paus - Let's take a look here at the results if the exponential constant is reduced. [It's] just the opposite, I've run it here from 460 down to 300. I've run through the calculations in exactly the same way. The exponent here becomes 1. And if you recall our earlier discussion, an exponent of 1 means that the number to which it is applied is unchanged. The result is an increase in the taxes you would expect. What happens if, remember there's another constant in the calculation, and that was the PEL here, the 300/bbl per day in our other calculation, here I show in Case 4, the results of changing that 300 to 400. Now this change could come about as...a consequence of the law being changed. The law currently says the production at the economic limit is assumed to be this calculation right here with 300. If they change the law to make it 400, the result would be as we'll show you here now. It could also come about as a consequence of the oil companies petitioning and the Dept. of Revenue approving a higher PEL allowance for a particular field. The result, I won't carry you all the way through this, just go down to the bottom, is in this case, a very small decrease in the tax. Basically we're saying here this is the amount of oil you get for free, and naturally that reduces the tax.

Now if this had been, the result here is reduction from .822, I believe, to .816, a very small reduction. But if this had been a much smaller field, and if this factor in the calculation right here had been smaller, the result could have been much more significant in terms of a tax reduction. But the principle [still] holds, and that is when the PEL constant is increased, the tax decreases. And that tends to be more important for the smaller fields, but it holds true for all fields. And I won't show you another example, because it's just the other way around. If the PEL constant is decreased, the tax increases.

That is how the tax is calculated and now it seems like the best way is to run this sort of backwards to show you how [the legislature got to this point] ([though] nobody really knows what went through the collective collegial bodies' minds when they make a decision like this). [W]hat was in the minds of the legislators who grappled with these problems in 1976 and 1977, [what were] some of things that they were thinking about? [T]o do that, I'd like to start with the tax law as it existed in 1977. This chart is actually from the 1977 session, and the axes here are the average barrels per day, the same axes that we had on our other chart, and the percentage tax rates, not the ELF here, this is the total percentage tax paid. So it's similar to what the ELF is but in this case we didn't have an ELF at the time and we're looking at the effective tax rate which, in the case of the '77 law, was the same as the nominal rate.

Let's focus on this scalloped curve right here. This is the law as it existed in 1977. It had been adopted in the 1973 special session. Some people call it the pipeline session. The law provided that the first 300/bbl of oil produced from a well during a day were taxed at 5%. And with what's an increasing block structure, which is very similar to the kind of structure that

you pay [on] your electric bills in most areas, except reversed. With electric bills, you usually pay less for the higher consumption, and in this case, the more you produce, the higher was your tax rate. Now those blocks produced this kind of scalloped appearance when they're applied to the average daily production and the rate that you're actually paying. For the next 700 B the rate was 6%. So you paid 5% on the first 300 B and 6% on the next 700 B, which meant that the average rate, which is what we're talking about here, never quite got up to 6%, because you always had this low price block down here. The next block, the final block, which was everything over 1000 B was taxed at 8% flat tax. So that if you've got it way, way out here, you eventually got close to 8%, and it was about 7.5% here around 3,500 B per day. That was the tax as it stood, so the effective rate, if you had 4,000 B per day of production, was about 7.6%. The top marginal block was 8%. Nobody was taxed more than 8%. If you were very, very productive in terms of average daily per well production, your tax rate was approaching 8%.

COUNTER #206

Okay, what was wrong with that? Why did the legislature want to change it? Well, I think there were two things in the minds of this special oil and gas and pipeline impact committee when they proposed what became known as House Bill 144. They wanted to reduce the tax rate for low productivity fields. This is the same kind of declining block structure under the bill that was introduced by the special committee that was formed to study this. And that bill reduced the tax rate for fields with productivities of less than about 1200-1300 B per day and increased the tax rate, substantially increased the tax rate for the high productivity fields. It was a device, a proposal that would have increased the taxes for the fields that have high average daily production and would have decreased the taxes for fields with low average daily production. Why did they want to do that? Well, clearly one thing that was in their mind and that they said in their report was that they were fearful that a 5% rate on these low blocks would cause Cook Inlet fields to shut down in some future year. They were seeing the gradual decline in productivity of the Cook Inlet fields and there was concern that that was something that they didn't want to see, they didn't want to see those jobs lost, and they didn't want to see the dead weight economic loss of shutting down a field when it was actually producing enough oil to make its cost. So they proposed that the first 100 B of oil paid absolutely no tax at all, and the next 200 B pay tax at the rate of 3% and so on, on up, so that the maximum tax rate was, if I recall correctly, 12%, it may be 12½%, I don't recall the top block. But as you can see, this was a very hefty tax increase for these more productive fields.

The Dept. of Revenue had, through 1976 and 1977, been conducting a major study of oil and gas taxes and it to this day remains a very, very useful piece of work. I have a copy with me in my briefcase back there right today in case questions come up that I can't answer, because it is even now, though somewhat out of date, a very useful document. It is primarily authored by John Messenger and his associate Tom Williams. As a result of that study and discussions within the administration and the Dept. of Law and the Dept. of Revenue, and Governor Hammond at that time, they came forward and introduced a proposed legislation that would have looked, had it been adopted, like this curve shown here. It contained an Economic Limit Factor without the exponent. Remember, in most cases, the exponent was a factor that when raised, reduces the tax.

The problem, I think, that some people saw with that was that it created too high a tax, too soon. In other words, a field here with, let's say 300/bbl of productivity would be paying tax of around 7%. That was even higher than the existing tax here and it was exactly those kinds of fields that the special oil

and gas committee was concerned with in terms of providing some tax breaks for them. Their proposal provided substantial tax breaks for every field producing less than 1300/bbl per day, that is a break in comparison with the laws that stood at that time. So there were attempts made to adjust the Economic Limit Factor...in the administration's bill. And that intent, since there were really only two factors you could adjust in that bill, one was the Production at the Economic Limit, which in their bill was 100. They said well if you don't want to lower that, let's just increase it, and so here was a, this was never introduced as a bill but was discussed as a proposal, Economic Limit Factor of 1000. Well, without the exponent, what happens is that this curve gets pushed this way, it actually gets pushed, this point gets moved to here and this curved area gets pushed down to here. That didn't produce the result that people were comfortable with either because it was felt that the result was even too big a tax break for the fields that were in this region right here. And, as well, when you gave that tax break, the result was the depression of the curve over in this region here. You couldn't avoid it if the calculation of the formula was such that if you moved this over here, this part came down as well. So, I think the desire was, and this is my guess, there was some evidence in the written record to indicate that this was what in fact was in the minds of some legislators, they wanted to give this break here, but they didn't want to give this big a break out here, and they couldn't figure out a way to do it with the Economic Limit Factor that the Dept. of Revenue had presented. And legislators kept saying, well, I'd like to use the Dept. of Revenue's formula because it's always good to get the administration's bill passed and put your amendments on the administration's ideas rather than try to do it the other way around, but they were saying,"We want a curve that incorporates the administration's formula, but one that more closely approximates what we've got here in our own bill. Can you give us an ELF factor that produces this?" And the result was the exponent because the exponent allowed you to push this part of the curve this way, to push the curve inward without pushing this part down very much, pushing this outer edge down very much.

It's interesting, some people say that these kinds of complications in law wouldn't happen if the legislature and the administration didn't have a bloated bureaucracy to dream up crazy ideas like this. And I think that's absolutely true, but it wasn't the bureaucracy that dreamed up the idea because they wanted to complicate the law, it was because the legislators and the policy makers came and said I want to accomplish a result, how do we do it? And that's how it happened that the ELF got an exponent.

COUNTER #302

The two bills that...ended up in free conference committee then had three things that they could adjust. The nominal rate, the exponential constant and the Production at the Economic Limit, and they also had a cents-per-barrel factor which I can get into if you like. I think it's probably worthwhile covering, but I think I'd like to reserve it for a little bit later.

In terms of the nominal rate, the house bill suggested 12.5% of value, the Senate wanted 11.5% of value, two different nominal rates which meant that the senate bill's curve headed up towards 11.5, never quite got to it, and the house bill was above it, was headed up towards 12.5, also never quite reaching it. The presumed Production at the Economic Limit in the house bill was 300/bbl per day and in the senate bill was 100/bbl per day, which was to say that the house bill gave a bigger tax break under the PEL, than did the senate bill. I think that reflected the greater concern in the House with the production problems that might in the future occur in Cook Inlet, or that were seen as a potential future problem in 1977.

The final factor that the free conferees were arguing about for those two weeks was the exponential constant, and the Senate wanted 750 and the House wanted 300. And to make a long story short, they compromised. In the very last minutes, as often does, it came together very quickly with a compromise which was a very small reduction in the House's proposed nominal rate from 12.5 down to 12.25, and they got to the end where they were arguing about hundredths of a percentage point, and they compromised on the House's part, or really a willingness on the Senate's part to adjust that exponential constant downward and there was some disagreement among the various oil companies as to their reactions to that and I don't think any of that disagreement ever got on the record, but it least it was said that some of the smaller oil companies operating in Cook Inlet felt that some advantage for the larger oil companies had been gained at their expense. I don't know if that's true, but that was an interesting side light on the negotiations and discussions.

COUNTER #348

There were probably ten or, there were a multitude of curves of this nature drawn and I think that's about all I can tell you about what went on in 1977 free conference. But the formula we worked through today arose out of those kinds of political compromises and I think it's the fact that the free conferees had to get in to this material as deeply as they did and as we have done today that has persuaded Gordon Harrison to ask me to go into as deeply as I have.

There are a whole lot of additional things that probably should be talked about, including the cents-per-barrel differences in 1977. The House proposed a cents-per-barrel tax...with an annual adjustment to the cents-per-barrel, based on the GNP deflator, basically based on inflation. So, had the House provision in that regard been adopted, the cents-per-barrel floor would have risen each year to keep pace with inflation and we haven't calculated what it would have been. The House proposed 93¢ per barrel, so it clearly would have been somewhere well above $1.00 by now as a floor for the severance tax.

There's another interesting side light. The Dept. of Revenue initially proposed in 1977 and later retracted, or withdrew, a proposal to provide a royalty credit against severance tax, and it was a cute little device that would have, had it been legal, or had it been adopted, would have protected royalty revenues with a floor of sorts, in effect, using the severance tax as a means of providing a floor under royalty revenues as well. Senator Ferguson, who was around all this time, and Sen. Eliason haven't said anything about these, I hope that your memory ... accords with mine on these points.

The Senate had proposed a cents-per-barrel floor of 75¢ per barrel and had said that there would be no escalator. They compromised on that at 80¢ per barrel and that's where the 80¢ per barrel comes from that's in our law today. That's a good stopping place, I think, for the moment. There are a whole lot of other things to go into, but now is probably a good time to pause.

What comes next, if we want to go into it, Mr. Chairman, is the procedure for establishing the Production at the Economic Limit. The 1981 amendments, which of course gave us the tax system we have and which substantially changed the applicability of the ELF, as Mr. Nelson pointed out earlier, the ELF doesn't at this moment apply to Prudhoe Bay and that's because of what was done in 1981. Do you want to go on to those right now, Mr. Chairman, or do you want to pause at this point?

COUNTER #398

(QUESTION from Rep. Grussendorf: What would be your timing on that, Gregg?)

I think the 1981 amendments we could probably get through before lunch, and probably finish up this whole thing before lunch, unless you want to take an early lunch. I guess I'm getting a little hoarse, but that's alright.

(QUESTION from Rep. Grussendorf: Are there any objections to continuing?)

(QUESTION from Sen. Abood: One question, Mr. Chairman, I want to be sure it's straight. The only two fields that are affected are the Milne Point and the Kuparuk at this present time, is that correct?)

Affected by the ELF? I don't believe that's correct, but I would defer to my colleague, Tom Chester, who's probably looked into it. Cook Inlet fields, of course, are affected as well. And I think...

(QUESTION from Sen. Abood: But you were saying, if I may, Prudhoe Bay is not effected by it, but Kuparuk and Milne Point according to this graph, is affected by it?)

The Kuparuk field does have the ELF applied in calculation if its taxes, and the Milne Point field does as well, yes.

(QUESTION from Sen. Abood: So everything but Prudhoe Bay is affected by it?)

At this time, that's correct. (tape unintelligible) It appears that that would the case, yes, unless the law is altered.

In 1981, let me back up, because there's one thing I should really say that I am not really the expert to talk, or the person to profess any expertise on, and that is the procedures under which the Production at the Economic Limit can be modified. And I am going to defer to Mr. Monkman or Ms. Vogt or Dr. Logsdon, if you want to go into more detail on those procedures. They're dealing with them on a daily basis. But the 1977 law, both versions, the House version and the Senate version, had a provision that said if the oil companies came in and could show that the costs of their production, and the bill defined costs very narrowly, although it left some ambiguities which I think may be a matter of some concern, if the oil companies could come in, or any oil company, any producer, could come in and show that its costs or the revenue from the production of the given 300 B was not enough to cover its narrowly defined costs, then the company would be entitled to, and the Dept. of Revenue was directed to grant, a higher Production at the Economic Limit. That factor, that provision was, I must say in my memory, not particularly a matter of concern to either side in the negotiations. There was concern that the language be written very tightly and of course, as usually often happens in this case, the concern of those of us who were drafting at the direction of the committee was to define those costs very narrowly. It turns out that that wasn't the problem, and as is often the case, it's the problem you don't think about is the one that comes back and grabs [you]. So, if there are further questions on that, I think I'd like to defer and have them direct it to the Dept. of Revenue, since they're in administrative hearings and are thinking a lot about it, if it's alright with Mr. Monkman.

COUNTER #458

(QUESTION from Rep. Grussendorf: Any last questions of Gregg, here on PEL?)

Let's go on to 1981 then. In 1981, I don't think we want to go through the long history of the 1981 situation, but in brief, the state had been sued with respect to the constitutionality of its oil and gas corporate income tax. And as a result of the deliberations in the 1981 session, there were attempts to settle that lawsuit legislatively, that is to remove the provisions of the petroleum corporate income tax that was passed in '78, which offended the oil companies, and thus settle the law suit. Those efforts came to naught, but there were efforts and concern on the part of the administration of Governor

Hammond to limit the state's liability by substituting another kind of tax that would not be so legally, at least would not be subject to the legal vulnerabilities that some people thought the oil and gas corporate income tax, that was then called, by shorthand, separate accounting, was supposedly vulnerable to.

The legislature decided to repeal the separate accounting tax and substitute a different tax which, it was felt, would be less subject to legal threat. The result of that change was a substantial reduction in revenue to the state. And to counterbalance that reduction, significant changes were made in the 1977 severance tax. The effect of those changes were to increase the tax rate at Prudhoe Bay from what was then about 11% up to 15%. This was done by establishing in the law, what I call in a shorthand way, the ten-year ELF trigger. And the ELF trigger says that any time a field has been in production for ten years, if that field began production before 1981, that it, the ELF goes into effect only after ten years of production. That is why Prudhoe Bay does not have the ELF applied in calculating its effective tax rate right now. Now there was also another trigger in the 1981 law and that's the .7 trigger. And I know this sounds very confusing and it is because the 1981 amendments were confusing. They were, in my opinion anyhow, kind of jury-rigged to produced the revenue result that was needed to balance the losses of revenue resulting from the change in the separate accounting to modified apportionment tax in the income tax side.

The theory behind it however, there was a theory behind those changes, and the theory behind the changes was that a field would be entitled in general (and this wasn't in the law this was sort of the theory behind it) to five years of production with a tax rate of 12.25% and that thereafter the tax rate would go up to 15%. Since Prudhoe Bay had already producing for five years in 1981, it meant that Prudhoe Bay had about five years to go without, actually in terms of the effective date about seven years to go, and with a tax rate that was not affected by the ELF. In addition, that unfortunately didn't get enough money to make up the difference, and so it was rather arbitrarily the law was designed so as to apply a 15% rate to Prudhoe Bay during the present time on the distinction that it came into production earlier and that they were going give a better tax situation to the smaller fields that were expected to come on after 1981. //

COUNTER #536

So the result is that Prudhoe Bay has a calculated ELF of about .8 right now, which being above .7, doesn't trigger the .7 trigger, which if it did would cause the ELF to be applied. As a result, Prudhoe Bay pays a full 15% tax and will do so until it has been in production for ten years, which happens next year. That change means that there will be a significant reduction in the amount of severance taxes that the Prudhoe Bay field will produce for the State of Alaska.

That reduction sometimes gets caught in a kind of semantic difficulty. [I]t certainly is a reduction from the tax that is currently being paid by the oil companies on their Prudhoe Bay properties and their Prudhoe Bay production. It is not, however, a reduction from the current tax law, so I think it's useful in discussing this to remember that semantic distinction there. Usually we can say current tax and compare it with something else, in this case the word current tax can have two quite different meanings. So that is...one kind of ELF legacy, if you will, that is left over from the 1981 session: he ten years is running out and Prudhoe Bay is waiting to get its ELF.

The second legacy, and one that really works the other way, is that the five years that fields are allowed to produce at 12.25%, and this only applies to the newer fields, means that in the 1990's or late 1980's some of these newer

fields are going, actually they'll all be in the 1990's, are going to have a significant tax increase. Endicott for example, is going to be subjected to about an increase from, I don't know what the effective rates are, but it's about a 20% severance tax increase in about 1991-1993 (I don't have that sheet in front of me, but Tom Chester will talk to you later about the revenue effects of these things and show that to you) because the nominal rate changes from 12.25 to 15% in that year. Now if those fields are marginal, it's probably [not] something you want to hit with an extra tax burden at that time. That is another legacy left by the 1981 amendments.

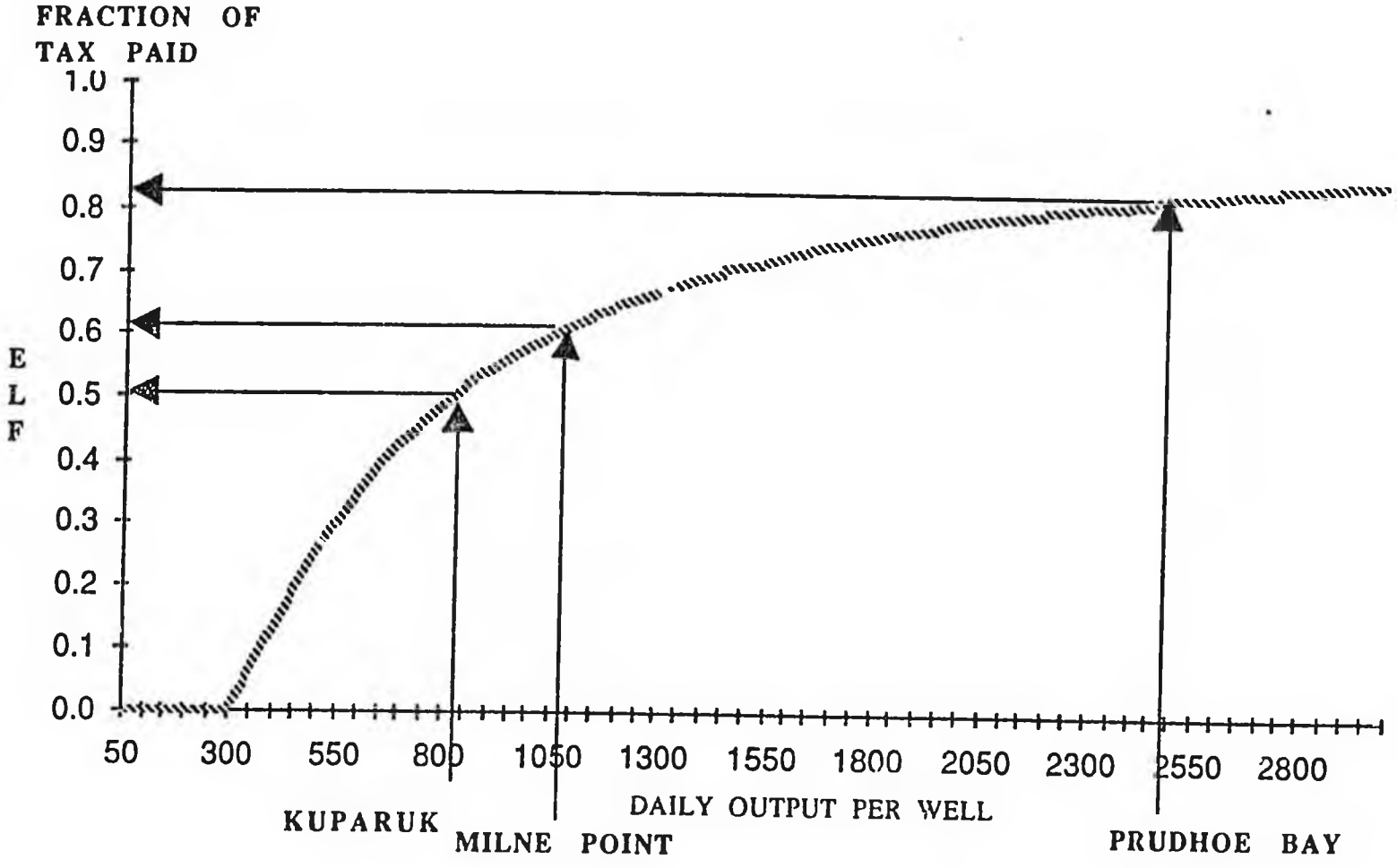
There is, of course, the legacy of the 1977 session, in what Mr. Monkman has descriptively called the "trap door in the floor." That is the application of the ELF to the cents-per-barrel which means that the tax rate could in fact fall to zero. Something that I don't think was contemplated or thought about one way or the other very much at the time the bill was drafted, although others may have a different opinion on that. So there are at least these two legacies from the 1981 amendments, and those may or may not be something you'll be interested in looking at further.

That concludes my presentation, and I am to be followed, presumably this afternoon, by my colleague, Tom Chester, who will discuss with you the revenue implications of these legacies, if you will, and the ways that those revenue implications could be altered, some of the ways that those revenue implications could be changed.

(QUESTION from Rep. Grussendorf: Before we break, do we have any questions of Gregg? When we come back, we'll be dealing with revenue effects of ELF and then the previous proposals to change ELF. Will coming back at 1:00 be acceptable with you? Let's recess until 1:00.)

END OF TAPE 2, SIDE 2, COUNTER #633

ECONOMIC LIMIT FACTOR



CASE 1

HOW THE ELF IS CALCULATED

ELF = (1 - [PEL/TP])exp(460*WD/PEL)

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = 300 barrels * 541 wells * 30 days = 4,869,000 barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(460* WD / PEL)

ELF = (1 - [4,869,000/40,201,710])exp(460*16,230/4,869,000)

ELF = (1 - .1211) exp (1.533)

ELF = (.8789) exp (1.533)

ELF = .82

CASE 2

WHAT HAPPENS WHEN THE EXPONENTIAL CONSTANT IS INCREASED?

$$ELF = (1 - [PEL/TP])\exp(1000*WD/PEL)$$

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = 300 barrels * 541 wells * 30 days = 4,869,000 barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(1000* WD / PEL)

ELF = (1 - [4,869,000/40,201,710])exp(1000*16,230/4,869,000)

ELF = (1 - .1211) exp (3.333)

ELF = (.8789) exp (3.333)

ELF = .65 **RESULT: A DECREASE IN THE TAX**

CASE 3

WHAT HAPPENS IF THE EXPONENTIAL CONSTANT IS REDUCED?

ELF = (1 - [PEL/TP])exp(**300***WD/PEL)

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = 300 barrels * 541 wells * 30 days = 4,869,000 barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(**300*** WD / PEL)

ELF = (1 - [4,869,000/40,201,710])exp(**300***16,230/4,869,000)

ELF = (1 - .1211) exp (1)

ELF = (.8789) exp (1)

ELF = .8789 **RESULT: AN INCREASE IN THE TAX**

CASE 4

WHAT HAPPENS WHEN THE PEL CONSTANT IS INCREASED?

ELF = (1 - [PEL/TP])exp(460*WD/PEL)

PEL = (Production at the Economic Limit) =
(**400** barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = **400** barrels * 541 wells * 30 days = **6,492,000** barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(460* WD / PEL)

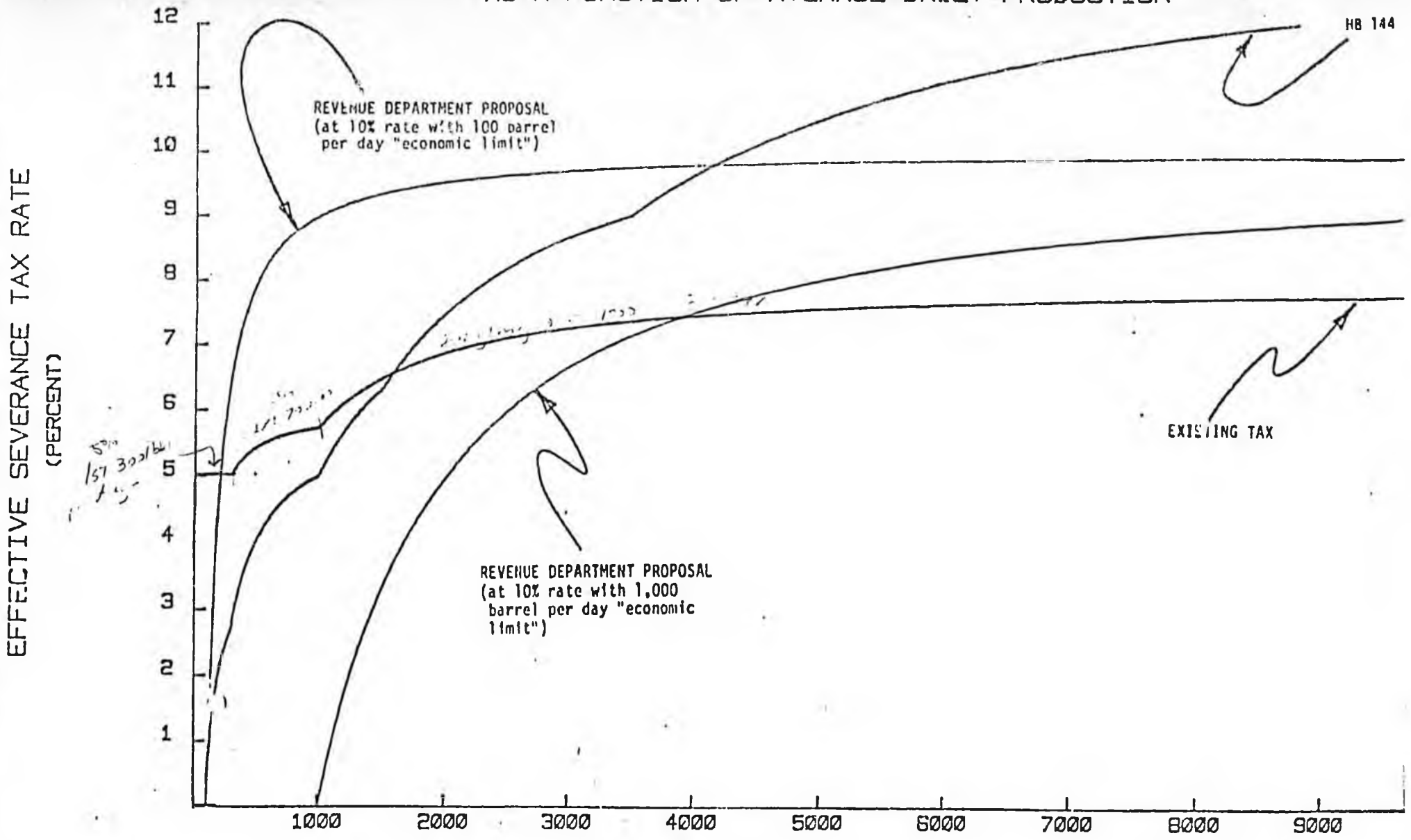
ELF = (1 - [**6,492,000**/40,201,710])exp(460*16,230/**6,492,000**)

ELF = (1 - **.1615**) exp **(1.150)**

ELF = **(.8385)** exp **(1.150)**

ELF = **.816** **RESULT: A DECREASE IN THE TAX**

EFFECTIVE SEVERANCE TAX RATE
AS A FUNCTION OF AVERAGE DAILY PRODUCTION



DOR Y=10*(X-100)/X: INTEGRAL F(X)=05114.05

DOR Y=10*(X-1000)/X: INTEGRAL F(X)=07005.65

LEGISLATIVE AFFAIRS AGENC
RESEARCH DIVISION
15 February 1977

Office Correspondence

STANDARD
ALASKA PRODUCTION

TO: G. N. Nelson

DATE: October 16, 1986

FROM: G. J. Abraham

CC NO:

SUBJECT: Proposed Severance Tax Changes

YOUR REF:

I have some serious concerns with the proposals before the Joint Special Committee on State's Tax Policy (Committee) to alter the Economic Limit Factor (ELF). Implementation of the proposals to amend or eliminate the ELF presented by OMB at the September 11, 1986 meeting could result in decreased recovery at Prudhoe Bay and could significantly impact future exploration and production activities in Alaska.

Prudhoe Bay Development

Prudhoe Bay is a field of 10 billion barrels of recoverable liquids out of 22 billion barrels in place. Approximately five billion barrels have already been produced leaving a reserve of five billion barrels. Up to four billion barrels of that remainder could be recovered under current State tax law with the wells and facilities in place. Premised on these tax laws, over $5 billion has been spent in the last four years on the drilling of 285 new wells and projects such as Waterflood, Gas Lift, and Enhanced Oil Recovery/Natural Gas Liquids (EOR/NGL).

Recovering the remaining one billion barrels will require additional capital investment in facilities and drilling. Many of these future investment decisions are only marginally economic. This future development and some of the expected production from the current wells and facilities is jeopardized by the proposed changes to the ELF.

Additionally, Prudhoe Bay contains 12 billion barrels unrecoverable with current technology. Some of this currently unrecoverable oil could be recovered with improved technology and major capital investment. Significant increases in taxation will curtail the research necessary to pursue these thinly margined projects and further reduce potential future State revenues.

The ELF is important in decisions to continue development within the Prudhoe Bay Unit. Consider, for example, the decision to drill additional wells at Prudhoe. Removal of the ELF benefit will in many cases make additional wells uneconomic. Four hundred or more future wells will be required to realize the additional one billion barrels referenced. Preliminary studies show that elimination of the ELF could

reduce future drilling at Prudhoe Bay by over 25%, reducing ultimate recovery and industry and State revenues. From the State's perspective, direct losses accrue in the areas of royalty, production tax, income tax and annual property taxes as well as in the secondary areas of employment and economic stimulation.

An ELF modification which involves an additional total field production factor would eliminate some projects which increase field production by raising the severance tax rate on the whole field and thus making the incremental project unattractive. From a broader perspective, selectively penalizing large fields like Prudhoe will curtail their development short of their full potential as discussed above. Further, penalizing large fields discourages unitizations which are an efficient means of managing a reservoir for maximum benefit to the industry and the State.

Alaskan Development Impact

In addition to the Prudhoe Bay impacts, tax increases could have significant adverse effects on future Alaskan oil development. Decisions to proceed with exploration and development projects are based on after-tax economics. There are three tax related factors:

- Cash to finance the project,
- Competitive after-tax returns on investment, and
- Stable business environment.

Cash to Finance the Project

Standard has invested $12 billion on Alaskan exploration, development and transportation. This investment record for TAPS, Prudhoe Bay, Endicott, Kuparuk and Lukiuk, demonstrates the company's willingness to invest in Alaska when competitive after-tax returns are projected.

The oil industry, as well as the State of Alaska, has a severely constrained cash flow. Virtually all major oil companies have significantly reduced 1986 exploration and development budgets and workforce. Standard's 1986 original capital budget for Alaskan field development has been reduced from $923 million to $675 million. Standard's workforce was reduced in July by 172 people.

Increasing industry taxes through changes to the ELF will further reduce the industry's ability to continue to invest in Alaska.

Competitive After-Tax Returns On Investment

The future commitment of available exploration and development funds to Alaska will depend on whether the projected returns are competitive with alternative uses of the funds. The ELF is also critical in this regard.

Modification or elimination of the ELF which increases the effective tax rate on major fields will discourage exploration. Arctic exploration involves expensive, high risk ventures such as Mukluk. These risks are taken to find major, profitable fields such as Prudhoe Bay and Kuparuk. Smaller fields are generally a by-product of these efforts. Where the taxation system reduces significantly the profitability of a major field, the high cost exploration risks will not be taken and neither large nor small additional Alaskan fields will be found.

Stable Business Environment

A fair and stable taxation system is a critical component in any business environment. Under the current taxation system, production taxes can be reduced by the ELF where the wellhead value closely approaches the operating costs allowing continued production. Alaska's highest in the nation production tax rate of 15% and highest in the nation production tax floor of 80¢ per barrel will be reduced for Prudhoe by about 20% after ten years of production.

The large Alaskan development expenditures outlined above were determined to be economic based on existing tax laws. Changes in these laws - which result in tax increases - send several unwelcome messages to the oil industry. One message is that the industry could expect tax increases in major fields after the major capital outlays have been made. A second message is that during hard times for the industry and the State, oil industry tax increases will be considered regardless of their impact on the industry.

It is easy to estimate the State revenues to be generated by tax increases. It is difficult to quantify the very real lost future production and the consequent losses to State revenue and the overall Alaskan economy that will be incurred as a result of the enactment of a severance tax increase.

Recommendation

In light of the adverse impacts of increased severance taxes on the Prudhoe Bay Unit and other future industry exploration and development activities, I recommend that these comments be forwarded to the Committee. Hopefully they will provide the Committee with a more balanced perspective in which to consider tax policy and the resulting longer term implications.

G. J. Abraham

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John R. Kemp
Division Manager

Conoco Inc.
3201 'C' Street, Suite 200
Anchorage, AK 99503

September 4, 1986

Joint Special Committee on State's Tax Policy
Senator Frank Ferguson, Chairman
1024 W. 6th Street, Suite 203
Anchorage, Alaska 99501

Dear Senator Ferguson:

The high drilling and production costs and the decline in the value of crude oil significantly impacts the development of new fields in Alaska. It also impacts the decision to continue operating any fields in the State. One of the cost factors, the State's oil and gas production tax, is directly controlled by the State. The modifications and revisions to the present production tax statutes may be the deciding factor for future oil and gas development in Alaska.

The present production tax is based on a monthly production rate at the economic limit OF 300 barrels/day times the number of well days. This is called the economic limit factor (ELF). The statutory presumption is that the ELF represents the producer's break-even point. It is presumed that the producer is making profit from the production of oil and gas before reaching the ELF. The ELF, however, may be rebutted. Rebutting the presumption allows a producer to establish by clear and convincing evidence that the break-even point is higher than 300 barrels for the field or unit. Successfully rebutting the ELF and establishing a new ELF results in a downward adjustment of the production tax payable by the producer.

The legislators who enacted the production tax statutes were farsighted and concerned that a rigidly structured production tax would force producers of economically marginal fields or units to shut down wells prematurely. See, e.g., Governor's transmittal letter for S.B. 238, March 11, 1977, 7th Journal, at 540-41. Prior to 1977, production tax liability was calculated on a rigid stair-step approach with incremental increased taxes based on the amount of production.

This approach was insensitive to the problems of marginal fields and the geographic variation of cost and production.

Early in 1977 after the introduction of the Senate and House production tax bills which would have continued the stair-step approach, the Alaska Department of Revenue published an in-depth comprehensive report titled "Alaska's Oil and Gas Tax Structure", a study with recommendations for improvement. See testimony of Sterling Gallagher, Commissioner of the Department of Revenue, before the House Finance Committee, April 14, 1977. In developing the presumptive ELF factor, the legislature has provided a mechanism to allow production tax relief to producers of marginally economic fields. The present production tax allows the producers to establish their actual break-even point and to be assessed production tax from the point of the field or unit's production at a profit. In essence, the producer is not forced to pay taxes while in a negative profit or loss situation. The provisions for this production tax relief are not automatic. The producer must request a formal hearing and prove by clear and convincing evidence that its break-even point is different than that presumed by the statute. The economic sensitivity in the current production tax statutes allow the States to grant relief to producers of marginally economic fields and allows the production operations to continue, rather than to shut-in during times of unprofitability.

Proposals for new legislation to change the ELF provisions are now under consideration. Conoco urges the legislature to look to the future of Alaska. In the short run, the State may benefit by establishing a fixed minimum tax. It is anticipated that the minimum tax would approximate the current 80 cents per barrel resulting from the presumed ELF. A production tax at this rate could contribute to the shut-in of Milne Point Unit. Shut-ins of these types of units and the prohibitive effect of a fixed tax on the development of new fields means a reduction in the State's employment rate and a detriment to the local economy. It also means a reduction in both the State and local ad valorem taxes. Alaska's economy will stagnate.

Conoco urges the State to maintain the current tax structure. Careful and thoughtful analysis was used in the establishment of the production tax, with the ultimate goal of maximizing both income to the State and the conservation of the State's most valuable non-renewable resource. A panic-induced tampering with the existing law may produce deleterious effects in both near term and long term economic stability. In the alternative, if action on the production tax must be undertaken, Conoco strongly urges that the first 50,000 barrels per

day of production from a unit be exempted from any proposed changes in the tax structure. This provision would maintain the original intent of maximi ng resource utilization in economically vulner.ble units. This type of provision will encourage the continued operation of Milne Point and other small units. It is also farsighted enough not to require y arly amendments and changes and, thus, will encourage the continued development of the oil and gas fields of Alaska.

Yours very truly,

FOR John R. Kemp
Division Manager

vv
HG/AEH
520.0

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G.N. Nelson
President

STANDARD
ALASKA PRODUCTION

September 4, 1986

Senator Frank Ferguson
Co-Chairman
Joint Special Committee on the State's Tax Policy
PO Box 131
Kotzebue, Alaska 99752

Dear Senator Ferguson:

I recently received the enclosed paper on the Economic Limit Factor prepared by Tom Williams and I thought it would be of interest to you and perhaps other members of the Special Committee. The paper presents an overview of the ELF, explains how it functions and why it was originally written into Alaska's statutes.

Tom prepared the paper at the request of the Alaska Oil and Gas Association Tax Committee. I must emphasize, however, that it is not an official AOGA position paper and should not be taken as such.

A copy of this paper is being also sent to Rep. Grussendorf and I leave it to your discretion to distribute it to other committee members.

I look forward to seeing you on September 11.

Sincerely,

George N. Nelson

cc: Rep. Ben Grussendorf w/enclosure

THE ECONOMIC LIMIT FACTOR
IN ALASKA'S OIL AND GAS PROPERTIES
PRODUCTION TAX

By Thomas K. Williams

September 1986

About the Author

Thomas K. Williams may rightfully lay claim to being the "father of the ELF" since he was the one who first proposed the idea of an economic limit factor for the production tax in late 1976, when he was Director of Petroleum Revenue for the Alaska Department of Revenue. As director, he had immediate responsibility for administering the state's oil and gas tax laws, and he drafted many of the regulations that are still in effect for those taxes. Mr. Williams was director from September 1975 until April 1979, when he became Commissioner of Revenue for the remainder of Governor Hammond's second term. Prior to joining Revenue Mr. Williams was an Assistant Attorney General for the state, specializing in oil and gas matters. He is currently Vice President and General Counsel of Cook Inlet Region, Inc. Mr. Williams received bachelor's and master's degrees in history from Princeton and Harvard, respectively, and earned his law degree at Stanford. He has lived in Alaska since 1973.

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WHAT IS THE ELF?

The Economic Limit Factor, or ELF, is a mathematical formula that changes the rate of tax on oil and gas production under Alaska's Oil and Gas Properties Production Tax (the "Production Tax"), AS 43.55. Without the ELF, these rates would be the nominal rates set out in the statute -- 15 percent 1/ of the value of taxable oil production 2/ (12.25% during the first five years of production from a lease or property 3/) or $0.80 per barrel, 4/ whichever is greater. 5/ The $0.80 cents-per-barrel amount is for oil having an API gravity of 27 degrees, and it is increased or decreased by half a cent for each degree above or below 27 degrees, respectively, in the API gravity of the actual oil produced. 6/ This adjustment to the cents-per-barrel amount

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1/ AS 43.55.011(b) (15 percent rate for oil produced after June 30, 1981).

2/ AS 43.55.011(a) excludes "any oil the ownership or right to which is exempt from taxation". Such exempt oil almost invariably is state or federal royalty oil.

3/ AS 43.55.011(b) ("for a lease or property coming into commercial production after June 30, 1981, the percentage-of-value amount equals 12.25 percent of the gross value . . . of taxable oil produced from the lease or property in the first five years after the start of commercial production and equals 15 percent . . . thereafter").

4/ AS 43.55.011(c). This statute also specifies a cents-per-barrel rate of $0.60 for "taxable old crude oil", referring to "old oil" under former federal oil price controls. With the expiration of those controls, there is no longer any current production to which the $0.60 rate applies.

5/ AS 43.55.011(a) requires payment of the Production Tax on the basis of the greater amount, with the percentage-of-value amount deemed to be the greater if both amounts happen to be equal. It used to be necessary to establish which amount was being used when both amounts were equal because former AS 43.55.011(d) (repealed by § 18, ch. 116, SLA 1981) called for certain payments into the Alaska Native Fund when the Production Tax was paid on the cents-per-barrel basis.

6/ AS 43.55.012(b).

for API gravity is made before the ELF is applied. 7/ For taxable gas, the nominal tax rate is greater of ten percent of its value or $0.064 per thousand cubic feet (Mcf) 8/ before applying the ELF.

The ELF ranges in value from zero to one, although the way the formula is set up, it could approach, but never actually reach, one. However, by statute, if the calculated value of the ELF under the formula is greater than 0.7 for oil during the first ten years of production from a lease or property, then the ELF is defined to have a value of one; 9/ after ten years of production, the ELF equals its calculated amount under the formula, whether it is above or below 0.7. 10/ There is no corresponding rule changing the value of the ELF for gas from its calculated value under the gas ELF formula. 11/

The actual tax rate for taxable production from a lease or property equals the nominal tax rate multiplied by the ELF for that lease or property. Thus for instance, with oil, as the ELF varies from one down to zero, the effective

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7/ Under AS 43.55.011(a) "[t]he tax is equal to either the percentage-of-value amount calculated under (b) of this section or the cents-per-barrel amount calculated under (c) of this section, whichever is greater, multiplied by the economic limit factor". AS 43.44.011(c) states "[t]he cents-per-barrel amount equals . . . $0.80 per barrel . . . as adjusted by AS 43.55.012 [providing for the API gravity adjustment]". Thus, the API gravity adjustment applies in determining the cents-per-barrel amount under "(c) of this section", and then, if that amount is greater than the percentage-of-value amount, it is multiplied by the ELF.

8/ AS 43.55.016. The reference in AS 43.55.016(c) to an "adjust[ment] by AS 43.55.012" in the $0.064 cents-per-Mcf rate refers to provisions in AS 43.55.012 that have since been repealed. AS 43.55.012(b), the only portion of AS 43.55.012 currently remaining in effect, is applicable only to oil. The reference to AS 43.55.012 is therefore an artifact from prior versions of the statute and no longer has any application; the cents-per-Mcf rate is uniformly $0.064 per Mcf (before applying the ELF).

9/ AS 43.55.013(b)(3).

10/ AS 43.55.013(b)(4).

11/ AS 43.55.013(c).

rate of tax can range between something at or very near its nominal rate of 15 percent (or $0.80 pe. barrel, if greater), down to zero. 12/

12/ The cents-per-barrel and cents-per-Mcf rates represent, in effect, floors on the prices used for Production Tax purposes. If prices drop below these floor levels, the cents-per-barrel or cents-per-Mcf rate kicks in. However, neither of these represents any sort of floor on the actual amount of tax collected. As explained below, the purpose of the ELF is to scale down the burden of the Production Tax so that the tax does not cause the cessation of production before the property would otherwise reach its economic limit (break even point). If the amount of production needed to break even equals the amount currently being produced, the ELF makes the tax zero whether the tax is calculated on a percentage-of-value basis or on the cents-per-barrel (or cents-per-Mcf) basis.

HOW THE ELF WORKS: THE BASIC THEME

The ELF depends primarily on two things. One is the volume of production needed to "break even" so that the gross value of the production just equals the total direct operating costs (as defined in the statute) for producing that oil or gas. The other is the volume of production actually produced during the month in question.

These two factors have a determinative role in the changing economics of an oil and gas property during its productive life, and the ELF attempts to recognize the economics and set the effective tax rate at appropriate levels throughout that productive life. In general the cost of producing an additional barrel or oil or an Mcf of gas starts off relatively low and increases with time, until eventually the cost of getting the next barrel or Mcf gets so high that it is no longer profitable to continue producing. This point at which operations cease to be profitable is called the economic limit.

The ELF, which gets its name (Economic Limit Factor) from this concept of an economic limit, takes an approximation of how much production is needed to break even at the economic limit, 13/ and then compares that production rate

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13/ The statute makes an approximation of the operating costs at the economic limit by specifically listing certain types of operating costs that one would reasonably expect to continue being incurred right up until the economic limit is reached. Such costs are "royalty, production supplies, purchased fuel, routine maintenance, and wages and benefits of employees working on the production operations." AS 43.55.013(e) (oil); AS 43.55.013(h) (gas). Other current costs are specifically excluded from the calculation of the operating costs at the economic limit because one would reasonably expect them to have been discontinued or no longer incurred by the time the economic limit is reached. These excluded costs are capital expenditures, tangible or intangible drilling expenses, costs of well workovers, and costs of replacement or repairs other than routine maintenance. All of these are excluded because they represent expenses or capital investments that a reasonable person would have discontinued making once the property got close enough to its economic limit that the additional cost or investment no longer promised to pay for itself. Amortization and depreciation are excluded because all past capital investments ordinarily should be fully amortized or depreciated before

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at the economic limit (PEL) to the volume actually being produced. This ratio is an indicator of the profitability of the lease or property. The smaller PEL is in proportion to the total production (TP) currently being produced, the more profitable the lease or property is and, theoretically, the better it can bear a greater "slice off the top" for the Production Tax. Hence the ELF approaches one (and the effective tax rate approaches its maximum possible rate) when the property is most profitable, but later as the property becomes more and more expensive to operate and less and less profitable, the ELF decreases and scales down the tax rate, until finally both the ELF and the tax are zero when the economic limit is reached.

An example will illustrate exactly how this occurs. In its simplest form, the ELF is one minus the ratio of PEL to TP. Put into algebraic terms, the formula for the ELF is:

$$ELF = 1 - [PEL/TP],$$

where PEL is the production rate needed to cover the projected direct operating costs at the economic limit, and TP is total current production. This is the present formula

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the property reaches its economic limit. Taxes are excluded because (a) the ELF would have reduced the Production Tax to zero when the property reaches the economic limit and (b) ad valorem taxes, even on a replacement-cost basis of assessment, should reflect the fact that there is no remaining economic life for the assets and hence they would be fully depreciated for assessment purposes at the economic limit (the third tax, the conservation tax of one eighth of a cent per barrel, AS 43.57, is disregarded as having a minimal effect). Insurance and overhead are excluded because they were not considered to be sufficiently "direct" in nature. The costs of terminating production operations and shutting down the property are excluded because they are not costs of production, but costs of ceasing production; if anything, the financial advantage (due to the time value of money) to be gained by deferring the termination costs might be enough in itself to induce an operator to continue producing a property even after it reaches what would ordinarily be its economic limit (i.e., after its production revenue started falling short of the direct operating expenses for continuing that production). The statute also allows the Department of Revenue to adopt regulations that include additional direct operating costs that are not specifically set out in the statute; the Department has adopted no regulation including any such additional types of cost.

for the gas ELF 14/ (formerly, when there were still federal oil price controls, it was also the formula for "old oil" production 15/).

Suppose there is a gas-producing property for which the PEL is determined to be 150,000 Mcf per month. Suppose further that initial production from this property is 500,000 Mcf per month. The ELF will be:

$$ELF = 1 - [PEL/TP]$$

$$= 1 - [150,000/500,000]$$

$$= 1 - [0.300000]$$

$$= 0.700000$$

The effective rate of tax will be seven percent of the value of the gas (0.700000 times the nominal rate of 10% equals 7%) or $0.0448 per Mcf (0.700000 times the nominal rate of $0.064 equals $0.0448), whichever is more.

Now suppose the property continues producing at 500,000 Mcf per month for five years, and then, starting in year six and each year thereafter, the rate of monthly production drops by 70,000 Mcf. The following table shows what the ELF and the effective tax rates will be during the life of this property:

Year	Production Rate	ELF	Effective Tax Rate	
			% of Value	$ per Mcf
1 - 5	500,000	0.700000	7.00000%	$0.044800
6	430,000	0.651163	6.51163	0.041674
7	360,000	0.583333	5.83333	0.037333
8	290,000	0.482759	4.82759	0.030897
9	220,000	0.318182	3.18182	0.020364
10	150,000	0.000000	-0-	-0-

14/ Id. ("The economic limit factor for gas production of a lease or property equals one minus the ratio of the monthly production rate at the economic limit to the production during the month for which the tax is to be paid").

15/ Former AS 43.55.013(a), repealed by § 18, ch. 116, SLA 1981 ("The economic limit factor for old crude oil production of a lease or property equals one minus the ratio of the monthly production at the economic limit to the production during the month for which the tax is to be paid").

As one can see from this table, when current production starts to decline, the ELF starts falling off too, but at a somewhat slower rate. For example, between Years 5 and 6 production in this illustration falls from 500,000 to 430,-000 Mcf, a drop of 14 percent (the drop of 70,000 is 14% of 500,000), but the ELF drops from 0.700000 to 0.651163, a decline of only 6.9767 percent (the change of 0.048837 in the ELF between Year 5 and Year 6 is 6.9767% of 0.700000). However, as the table clearly shows, the ELF eventually does fall off fast enough to get to zero when the economic limit is reached.

What this means in practical terms is that the ELF operates to keep the effective tax rate from initially falling off quite as rapidly as does the profitability of the property measured by the ratio of current production to production at the economic limit. Thus the State's Production Tax collections are higher than they would be if the ELF scaled the tax rate down in direct proportion to the property's profitability.

There is one other thing that this illustration reveals about the ELF, and that is why the effective tax rate cannot ever equal the nominal rates set out in the statute (except of course where there is a special statutory rule making the ELF one if its computed value under the formula is greater than 0.7). The reason is that the ELF itself can approach, but never quite reach, the value of one. For the ELF to equal one, the ratio of production at the economic limit to current production must be zero. 16/ In mathematical terms,

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16/ In the "complex" explanation of the ELF, the effects of the exponent in the oil ELF are explained. With the exponent, there is theoretically a second way for the ELF to equal one, and that is if the exponent is zero and the number to which the exponent is to be applied is not equal to zero. However, since the exponent is, in effect, the ratio of 460 barrels a day per well to the actual average daily production rate per well during the month in question, the exponent cannot be zero unless actual production were infinite (this is because 460 divided by any finite number, no matter how huge, will yield a number greater than zero; otherwise, if zero were the quotient, one would be able to reverse the process and multiply that huge but finite number by that quotient (zero) and get back to 460, but zero times any finite number is always zero). Since an infinite production rate is one of the two possible conditions that are described in the "simple" version of the ELF as making the ELF exactly equal to one, there is no practical difference between the "simple" and "complex" versions as to why the ELF is always less than one in the physical world.

if 1 = ELF, then 1 = 1 - [PEL/TP].

Clearly, [PEL/TP] must equal zero for this equation to be true, since if any number other than zero is subtracted from one, the result will not equal one. Thus,

PEL/TP = 0, or

multiplying both sides of this last equation by TP,

PEL = 0 x TP.

There is no finite number for TP which will, when multiplied by zero, yield a value for PEL other than zero. This is because zero times any finite number is always zero. And so, if the ELF is to equal one, either current production (TP) is infinite (which is possible in mathematics, but not in the physical world) or PEL equals zero (again, a practical impossibility, since no field would have costs of production equal to zero, especially at its economic limit).

Thus, the larger current production becomes in proportion to PEL, the closer the ELF comes to a value of one, but it never reaches one under the formula in the real world.

REASONS FOR THE ELF

The ELF operates to reduce the effective rate of the Production Tax as an oil and gas property nears its economic limit; i.e., the point where the income (gross value) from producing a barrel or Mcf of production from that property is just enough to cover the costs of producing that barrel or Mcf. At the end, when the property actually reaches its economic limit, the ELF makes the tax rate zero. Why has this ELF feature been included in the Production Tax?

The reasons for the ELF are both historical and economic. Prior to the enactment of the ELF in 1977, Alaska had a "stair stepped" Production Tax on oil in which the tax depended on the average daily rate of production per well. The first 300 barrels a day per well were taxed at five percent of their gross value, the next 700 barrels a day were taxed at six percent, and average daily production in excess of 1,000 barrels a day per well was taxed at eight percent. 17/ In addition, there were three similarly "stair

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17/ Former AS 43.55.010, repealed by § 9, ch. 136, SLA 1977. The three-tiered "stair step" tax (enacted in ch. 4, FSSLA 1973) replaced an earlier four-tier version, in which the four "stair steps" for percentage-of-value had been enacted first (ch. 247, SLA 1970), with the cents-per-barrel rates added later (ch. 101, SLA 1972). The four "steps" in the original progressive tax rate structure were 0 - 300 barrels a day per well (3% rate), 301 - 1,000 barrels a day per well (5% rate), 1,001 - 2,500 barrels a day per well (6% rate), and 2,500+ barrels a day per well (8% rate). When the cents-per-barrel rates were added to the Production Tax in 1972, they were coupled with a credit for royalty payments to the State, the intent and effect of which was to set a floor on combined state revenues from royalty and Production Tax, corresponding to a "wellhead" price of $2.65 a barrel (which would have dropped to $2.50 on July 1, 1980 if the law had remained in effect). If prices dropped under that floor, the "lost" royalty income would be made up by the corresponding reduction in the royalty credit against the cents-per-barrel rates. See ch. 101, SLA 1972; 1972 House J. 915-916 (Governor Egan's transmittal letter for House Bill 817, introducing the royalty credit concept; the House Finance Committee took the substance of HB 817 and incorporated it into a House Committee Substitute for a Senate Bill, SB 168, that had already passed the Senate; the version that became chapter 101 of the 1972 Session Laws was the Second Free Conference Committee

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stepped" cents-per-barrel rates -- $0.16875 on the first 300 barrels a day, $0.2025 on the next 700, and $0.27 on anything over 1,000 barrels a day. 18/ These cents-per-barrel rates were for oil having an API gravity of 27 degrees, and they were increased or decreased by two percent for each degree of API gravity that the actual oil production was over or below 27 degrees. The actual tax to be paid was the higher of the two, percentage-of-value or cents-per-barrel. 19/ The cents-per-barrel amount would be greater when the "wellhead" price 20/ fell below $3.375; for higher

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Substitute for SB 168, SFCCS HCS SB 168). Litigation over this and other enactments of the 1972 Legislature quickly ensued -- Amerada-Hess Corp., et al., v. State (Superior Ct. No. 72-2719 Civil), ARCO Pipe Line Co. v. Herbert (Superior Ct. No. 72-2798 Civil), Mobil Pipe Line Co. v. State (Superior Ct. No. 72-2720 Civil), consolidated. Legislation enacted by the 1973 Special Session, including repeal of the royalty credit provisions, made part of the litigation moot and allowed the remainder to be settled.

18/ Former AS 43.55.015(a), repealed by § 9, ch. 136, SLA 1977. Actually, the base cents-per-barrel rates (before any adjustment for API gravity) were not constant, but changed from month to month based on monthly changes in the Wholesale Price Index for crude petroleum from the Index for the month of December 1973. See former AS 43.55.015(c); Union Oil Co. of Cal. v. Dept. of Revenue, 560 P.2d 21 (Alaska 1977) (upholding the Department's regulation, former 15 AAC 05.694, which made the December 1973 Index the base Index). This monthly adjustment to the cents-per-barrel rates, in turn, meant that the effective floor price for the Production Tax revenue (i.e., the price at which the cents-per-barrel tax became greater than the percentage-of-value tax) also varied from month to month, depending on the Index.

19/ Former AS 43.55.010(e).

20/ The issue of what is the "wellhead" for royalty and Production Tax purposes has itself been hotly disputed. In Alaska when oil emerges from the ground at the "Christmas tree" atop the well casing, it is cleaned and dehydrated and separated from associated and dissolved gases before it is in a marketable condition. After it has gone through the surface equipment to make it marketable, it is then metered and either sold or

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prices, the percentage-of-value amount would be the greater. 21/ Thus, the cents-per-barrel rates, in effect, established a floor price for the value of the oil for Production Tax purposes, regardless of how low the actual "wellhead" price might fall.

To illustrate how the "stair step" tax worked, suppose a property had 10 wells and produced 450,000 barrels of 27-degree API gravity, valued at $10 apiece during a 30-day month. The tax would be calculated as follows:

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transported away from the property through some common carrier pipeline. In a number of other states, the "wellhead" price is effective at the outlet of the tank gauge or custody transfer meter at which it is first measured in a marketable condition. In Cook Inlet and on the North Slope, it may be miles between the Christmas tree and the custody transfer meter, and the separators and dehydrators represent significant expenditures. If the incidence of the tax or the royalty is at the custody transfer meters, none of the costs incurred upstream from that point for the gathering lines, separators and dehydrators and associated equipment would be deducted in determining the price or value for purposes of paying the tax or royalty. Conversely, if the incidence of the tax or royalty is at the Christmas tree, then all those costs are deducted in determining the price or value on which the tax or royalty is computed and paid. The phrase "wellhead price," while commonly used, can therefore be misleading or at least ambiguous in the Alaskan context, since it is unclear whether it refers to the price at the custody transfer meter or a price further upstream, perhaps as far as the Christmas tree. The Production Tax is based on the "gross value at the point of production", which is specifically defined to be the point of measurement (as opposed to the Christmas tree); see AS 43.55.140(6), 15 AAC 55.210(6).

21/ Five percent of $3.375 equals $0.1687, which is exactly what the cents-per-barrel rate was for the first "stair step." Six percent of $3.375 is $0.2025, the same as the rate for the second "step," while eight percent of it is $0.27, the rate for the third. By 1977 the escalation in the cents-per-barrel rates due to the Wholesale price Index (see note 16, above) had raised the effective floor from its original $3.375 to approximately $6.10.

0 - 300 bbl/day "stair step": 10 wells, times 300 barrels per well a day, times 30 days, equals 90,000 barrels in this "stair step" of the 450,000 total taxable barrels produced. Five percent of 90,000 barrels at $10 each equals $45,000. 90,000 barrels times the cents-per-barrel rate of $0.16875 22/ equals $15,187.50.

301 - 1,000 bbl/day "stair step": 10 wells, times 700 barrels per well a day, times 30 days, equals 210,000 barrels in this "stair step", of the remaining 360,000 barrels that didn't fall into the first "step". Six percent of 210,000 at $10 each equals $126,000, while 210,000 times the $0.2025 cents-per-barrel rate equals $42,525.

1,000+ bbl/day "stair step": 450,000 total barrels, minus the 90,000 barrels falling in the first "stair step" and the 210,000 barrels falling in the second, leaves 150,000 barrels to fall in this top "step." Eight percent of 150,000 at $10 a barrel is $120,000, and at $0.27 a barrel the cents-per-barrel amount is $40,500.

The total percentage-of-value amount would be $45,000 plus $126,000 plus $120,000, or $291,000. This is greater than the cents-per-barrel amount of $98,212.50 ($15,187.50 + $42,525 + $40,500), so the actual tax would be paid on the percentage-of-value basis. The effective rate of tax in this example would be 6.47 percent ($291,000 total tax, divided by a total value of $4,500,000 for the 450,000 barrels, equals 0.0647).

After this tax system was enacted in October 1973 (ch. 4, FSSLA 1973), factors affecting the Alaska oil and gas market changed dramatically. The Arab oil embargo of the United States in early 1974 caused oil prices, which had doubled since the previous May, to redouble. Construction of TAPS finally began in 1974, but costs for constructing

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22/ For simplicity, the example uses the original rates set out in the statute. In actual practice, those rates would first have been adjusted for changes in the crude oil Wholesale Price Index (WPI). One might also note that, by having 27 degree API gravity oil in the example, the example does not show how to make the API gravity adjustment of two percent in the WPI-escalated cents-per-barrel rates per degree above or below 27 degrees would be made. For an example illustrating all these aspects of the former tax, see Alaska Department of Revenue, Alaska's Oil and Gas Tax Structure: A Study with Recommendations for Improvement (February 1977) (the "1977 Tax Study"), pp. II-6 to II-10.

that project continued to skyrocket over all earlier projections. The federal government imposed a complex system of price controls on crude oil and refined products, with a big question mark deliberately left in the system as to how Prudhoe Bay oil would fit into it all once that field came into production.

Uncertain as to what all these changes might mean in terms of the profitability of Prudhoe Bay and the appropriate level and type of state taxation, the Alaska Legislature in 1975 retained Tanzer Economic Associates, Inc. to conduct an economic analysis of Prudhoe Bay, its profits, and the effects of state taxation policy on those profits. In January 1976 Tanzer's results were released. 23/ The "Tanzer Report" concluded that Alaska could significantly increase the overall level of its tax burden on Prudhoe Bay and still provide a sufficient degree of profitability to reward the oil companies there for investing in the development of the field.

A flurry of legislative proposals to increase oil taxes immediately followed, ranging from "excess profit" taxes to a "separate accounting" income tax, with higher Production Tax rates as an option somewhere in between. In the face of misgivings by the Department of Revenue about some of the proposals and the lack of a clear legislative consensus about which proposal(s) to adopt, Governor Hammond prevailed upon the Legislature to give the Department a year to make a comprehensive study of Alaska's then current tax structure and make recommendations in early 1977 about any changes that should be made. 24/ Because of strong support in the Senate for a "separate accounting" income tax 25/ and be-

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23/ Tanzer Economic Associates, Alaska's Prudhoe Bay Oil: Profitability and Taxation Potential (January 9, 1976).

24/ The 1976 Legislature, through a Committee Substitute for Senate Concurrent Resolution 101 (CS SCR 101), resolved that the Legislative Council, through its Interim Committee on Oil and Gas Leasing and Taxation Policy, was to cooperate with the Administration in making a comprehensive and definitive study of Alaska's oil and gas leasing and taxation policies, with recommendations for improvement.

25/ "Separate accounting" is one of two basic ways of determining how much of a multistate business's taxable income is attributable to its activities in a particular state for purposes of that state's income tax. It attempts to isolate the in-state activities from the rest of the business and see how much income results

(footnote continues on next page)

cause of criticism of the state income tax as early as 1973, 26/ the Department of Revenue and the Legislative Council engaged Professors Jerome M. Ziefman and Kenneth G. Ainsworth to make a special study of the income tax. 27/

The Department's report -- Alaska's Oil and Gas Tax Structure: A Study with Recommendations for Improvement (February 1977) (the "1977 Tax Study") 28/ -- was transmitted to the Governor on February 11, 1977. Besides incorporating the criticisms and recommendations of Professors Ziefman and Ainsworth about the income tax, the 1977 Tax Study examined the Production Tax, the state ad valorem tax on pipelines and production and exploration equipment and facilities, and the reserves tax. In its review of the Production Tax, the 1977 Tax Study noted:

> . . . Typically production taxes do not reflect the expenses incurred to obtain the production. The tax is either some specified percentage of the gross value of the production or a flat fee of so

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from the in-state activities. The other way is "apportionment," in which a slice of the business's total income is attributed to its in-state activities on the basis of a prescribed formula. Of the consultants advising the Legislature in the mid-1970s, perhaps the most respected was Milton Lipton of Walter J. Levy & Associates. He and Dr. Michael Tanzer of Tanzer Economic Associates, Inc. were preeminent advocates of separate accounting as the way to reform the state income tax and even Alaska's oil and gas tax structure in general.

26/ Milton Lipton, "Testimony at the Joint Hearings of Proposed Oil and Gas Legislation before the House and Senate resources Committees" (March 23, 1973 transcript), p. 7.

27/ Ziefman and Ainsworth, The Taxation of the Petroleum Industry under Alaska's Corporate Income Tax (January 9, 1977).

28/ The principal draftsmen of the 1977 Tax Study were John R. Messenger, then Deputy Commissioner of Revenue (Taxation), and Thomas K. Williams, then Director of the Department's Petroleum Revenue Division. Important editorial review and suggestions were made by Dr. David L. T. Knudson, Petroleum Economist in the Petroleum Revenue Division. Revenue Commissioner Sterling Gallagher closely supervised the preparation of the report.

many cents per unit of production. Since it is not based on net proceeds of the production operation, the production tax simply represents another cost of doing business to the producer. 29/

. . . .

Once a discovery has been made and production begins, however, the production tax (and the landowner's royalty) can have a more significant impact on the economics of the production operation and the associated decisions. As operating costs rise during the life of the field, the profit margin shrinks. At some point the total production costs overtake the value of the oil or gas produced, and production can then be continued only by operating at a loss. As one of the costs of doing business, the production tax contributes to the total costs and tends to hasten the time when this break-even point (called the economic limit) is reached. 30/

Besides this negative economic effect of production and severance taxes in general, the 1977 Tax Study drew attention to a particular problem with the "stair step" tax as it applied to areas of Alaska where the operating costs differed greatly from each other:

The current State oil production tax contains a "stair step" feature which is intended to alleviate the adverse impact that a production tax can have on an oil well operating close to its true economic limit. . . . The "stair step" feature of the existing oil production tax schedule is an attempt to reduce the tax rate as production falls closer to the true economic limit. The tax rate declines from 8% to 6% to 5% as individual well output falls. Unfortunately, the current "stair steps" appear to be sized incorrectly.

Economic factors governing production operations vary widely in the State of Alaska. Some areas in the State are located close to the refinery market and have low operating costs. In these areas wellhead values are high. As a consequence, the true economic limit (measured in barrels per day) for these properties can be quite low: 50 to 75 barrels a day per well, or even lower, in some cases in Cook Inlet.

29/ 1977 Tax Study, p. V-19.

30/ Id., p. V-21.

> Other crude oil wells in Alaska are not located close to refinery markets and could have extremely high operating costs. The netback value in the field for these isolated areas is lower than in Cook Inlet and the operating and capital costs can be much higher than in Cook Inlet. Accordingly, the true economic limit (measured in barrels per day) for these producing properties can be quite high. Depending on the property, this limit might range from 300 to perhaps 1000 barrels per day [per well]. There is, then, a rather wide range of values which can be generated regarding the minimum production level at which Alaska crude oil wells can be operated.
>
> From this perspective, an economic flaw in the existing or any other "stair step" production tax schedule becomes obvious. By establishing a fixed schedule of "stair stepped" tax rates, the State crude oil production tax is based on the faulty assumption that production economics are similar in Cook Inlet, Prudhoe Bay, and everywhere else in Alaska. 31/

To take care of these problems, the 1977 Tax Study made the following recommendation to replace the "stair steps" with the ELF: 32/

> The Department of Revenue recommends perfecting the "stair step" approach as a means of eliminating effects of the production tax on the economics of oil production operations. The key to doing so is not found by creating a series of "steps" and rates that succeed in this for any one area of the State, such as Cook Inlet. As explained in Chapter V, a well producing 1000 bar-

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31/ Id., pp. V-28 to V-30.

32/ The original idea for an economic limit was by the then Director of the Petroleum Revenue Division of the Alaska Department of Revenue, Thomas K. Williams, in response to criticism, particularly by Milton Lipton, about the adverse economic effects of the Production Tax on properties as they near their economic limit. The precise formula for the ELF proposed in the 1977 Tax Study (and still the formula for the gas ELF) was developed jointly by Mr. Williams and Dr. David L. T. Knudson, Petroleum Economist in that division. The exponent for the oil ELF and the number 460 appearing in the exponent were features added during the legislative process as the result of work by Alan Latham, who was working for the Legislature.

> rels a day may be quite a money maker in Cook Inlet but be mediocre or even marginal in other areas of the state such as the Interior or North Slope. Consequently the "stair steps" that succeed for the Inlet won't eliminate the economic effects of the tax elsewhere. Conversely, "stair steps" designed to eliminate those effects [for] production on the North Slope would give too much away to production in the Inlet.
>
> To eliminate this difficulty, the Department of Revenue recommends an Economic Limit Factor (ELF), based on the ratio of the rate at the true economic limit to the current production rate, as a mechanism for scaling down the tax rate as the production declines toward the economic limit. This would be done by multiplying a basic tax rate times the difference between unity (the number, one) and the ratio of rate at limit to current rate.
>
> . . . .
>
> If the tax law conclusively sets the rate at the economic limit at some specific rate like 200 barrels a day per well, the ELF becomes simply one more economically rigid structure like the present "stair steps." It would not respond to the great regional differences in economic scale for production operations in Alaska. But the great advantage of the ELF over any specific set of "stair steps" is that it can be tied to the actual economic condition of a property anywhere in the state . . . . (emphasis in original) 33/

This was the first public proposal to adopt the ELF as a replacement for the "stair steps" in the Production Tax. Instead of a series of discrete "steps" in production rates at which tax rates changed, the ELF represented in effect a smooth curve, a series of an infinite number of "steps" each infinitesimally small. But beyond simply smoothing the "steps" into a continuous curve, the ELF had the additional advantage of allowing the whole curve itself to be shifted, to reflect the rate of production needed for that particular property to cover its basic operating costs at the economic limit. It could reflect the fact that in remote areas of Alaska like Prudhoe Bay, the rate of production needed merely to break even would be very much greater than the rates needed to break even in the more accessible areas like Cook Inlet and the Kenai Peninsula. Thus, the adverse economic

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33/ 1977 Tax Study, pp. VI-17 and VI-19.

effects on the economic life of an oil and gas property were no longer a necessary evil of a tax based on gross production value as the Production Tax is.

Governor Hammond acted on this recommendation by introducing Senate Bill 238 to the 1977 Session of the Legislature. 34/ After much legislative wrangling, an amended version of this bill (FCCS HCS CSSB 238) finally passed, and the ELF became part of the Production Tax. 35/

34/ See 1977 Senate Journal, pp. 540-541 (Governor's transmittal letter).

35/ Ch. 136, SLA 1977.

HOW THE ELF WORKS: VARIATIONS ON THE THEME

A. Introduction to the Exponent. The ELF formula for gas production (and formerly for "old oil" under now expired federal oil price controls) is simple and straightforward in its operation. It is merely one minus the ratio of production at the economic limit (PEL) to current production (TP), or to put it into mathematical symbols:

$$ELF = 1 - [PEL/TP]$$

As current production (TP) declines toward the "break even" rate (PEL), the ratio of PEL to TP gets larger and larger, eventually equaling one when TP has declined to the point that it equals PEL. At that point, the ELF becomes 1 - 1, or zero. The tax is then also zero.

This same formula is at the root of the ELF for oil, except that there is, in addition, an exponent that is applied to it. (For a review of how exponents work and what fractional exponents mean, see Appendix A.)

The exponent in the oil ELF is a fraction whose numerator is 460 times the number of "well days" in the month when the oil was produced, and whose denominator is the monthly production rate at the economic limit. The number of well days is simply the sum for all wells of the number of days each of them was operated during the month. If 10 wells were each operated for 30 days during a month and two others were operated for 25 days each, then the number of well days is 350 (10 times 30, plus two times 25).

Depending on what PEL is, the exponent may be greater than, equal to, or less than one. If it is greater than one, the exponent is a "net power function" -- that is, the effect of raising to a power equal to the numerator of the exponent outweighs the effect of taking the a root equal to the denominator of the fraction. Conversely, if it is less than one, the exponent is a "net root function" and the effect of taking the root outweighs that of raising to the power.

As set out in the "simple" explanation of the ELF, the value of one minus the ratio of PEL to TP is always less than one and can range all the way down to zero. For numbers between zero and one, the effect of a "net power function" is to make the result smaller than the starting number. For example, 0.9 squared is 0.81; 0.01 to the fifth power is 0.0000000001; 0.5 to the "1.000001"-th power is 0.499999653. Conversely, the effect of a "net root function" on this range of numbers is to produce a larger number: the square root of 0.81 (0.81 raised to the "one half"-th power) is 0.9; the fifth root (the "1/5"-th or

"0.2"-th power) of 0.0000000001 is 0.01; and 0.5 to the "0.999999"-th power is 0.500000347.

The value of PEL therefore has an important but subtle effect on the exponent. If PEL corresponds to more than 460 barrels a day per well, the exponent becomes a "net root function" and makes the value of the ELF larger than the starting number to which the exponent is applied. On the other hand, if PEL is less than 460 barrels times the number of well days, the exponent is a "net power function" and makes the final value of the ELF less than the number to which the exponent is applied.

B. The PEL Presumption: To Rebut or Not to Rebut?

PEL appears twice in the oil ELF formula -- once in the exponent and once in the calculation of the number to which the exponent is applied:

$$ELF = (1 - [PEL/TP])^{([460 \times WD]/PEL)}$$

For oil there is a rebuttable presumption that PEL equals 300 barrels times the number of well days in the particular month. 36/ The presumption may be rebutted only once a year, and if it is rebutted, the value that is demonstraced to be the proper PEL must be used for that entire calendar year. 37/ If the presumption is not rebutted, then the formula for the ELF is, in effect, the following:

$$ELF = (1 - ([300 \times WD]/TP))^{(460/300)}$$

The decision to rebut the presumption or not, presents some subtle trade-offs that must be carefully considered before proceeding. On the one hand, if the presumption is not rebutted, then the exponent is a "net power function," which produces a result that is smaller than the number to which the exponent is applied. On the other hand, if the presumption is rebutted and shown to be greater than 300 barrels per well day, then the ratio of PEL to current production will be made greater, leaving a smaller number to which the exponent is applied. If the demonstrated PEL is still less than 460 barrels per well day, the exponent will remain a "net power function" although, as the value for PEL approaches 460 barrels per well day, the effectiveness of the exponent in reducing the number to which it is applied will diminish. The effects of rebutting the PEL -- that is, the reduction in the difference between one and the ratio of PEL to current production (that difference being the number

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36/ AS 43.55.013(d).

37/ Id.

to which the exponent will be applied), and the "net power function" nature of the exponent -- will both be working in the same direction and reduce the ELF.

If PEL equals 460 barrels per well day, the exponent becomes exactly equal to one and has no effect at all on the number to which it is applied. The effect of rebutting the presumption is then simply the reduction in the difference between one and the ratio of PEL to current production, which will still yield a lower ELF than if the presumption were not rebutted.

Beyond 460 barrels per well day, the demonstrated PEL will turn the exponent into a "net root function," which will tend to offset the advantage to be gained by reducing the difference between one and the ratio of PEL to current production. Although that advantage always outweighs the offsetting effect of the exponent (in other words, it is always worth rebutting the presumption if possible, because doing so reduces the final value of the ELF), the extent to which this happens depends on how what the current average daily production per well is. The higher the production rate, the smaller the net effect is from rebutting the presumption.

The following table illustrates this for four cases: Case 1 has current average production of 500 barrels a day per well; in Case 2 it is 1,000 barrels a day per well; in Case 3, 5,000 barrels a day per well; and in Case 4, 10,000 barrels a day per well, corresponding roughly to the expectations in early 1977 for what would be the situation with the Prudhoe Bay field by the beginning of 1978. 38/

38/ The throughput capacity of TAPS represents a physical constraint on the rate of production from North Slope fields. TAPS had been planned to start up in three phases: the first at a throughput of 600,000 barrels a day; the second and 1.2 million barrels a day; and the third at 1.5+ million. Until the third phase was implemented, TAPS's throughput capacity represented the upper limit at which the Prudhoe Bay field could be produced (Phase 3 would be at or above the maximum efficient rate for Prudhoe Bay of 1.5 million barrels a day). By early 1977 the first two phases had been "telescoped" together, so that TAPS was expected to be at 1.2 million barrels a day by the end of the year. That was, of course, before the fire and explosion at Pump Station 8 while the pipeline was being filled. However, for purposes of analyzing the ELF, the assumptions used by the Legislature and the Administration reflected the planned 1.2 million-barrel-a-day rate of production from the field into TAPS, with approximately 120 producing wells.

PEL	Case 1 (TP=500) ELF	Case 2 (TP=1,000) ELF	Case 3 (TP=5,000) ELF	Case 4 (TP=10,000) ELF
300	0.245372	0.578740	0.909486	0.954370
400	0.157103	0.555743	0.908565	0.954140
450	0.095012	0.542741	0.908095	0.954023
460	0.080000	0.540000	0.908000	0.054000
470	0.063701	0.537208	0.907905	0.953977
500	-0-	0.528509	0.907618	0.953906
600	---	0.495351	0.906644	0.953670
700	---	0.453309	0.905641	0.953430
800	---	0.396362	0.904608	0.953187
900	---	0.308240	0.903544	0.952940
1000	---	-0-	0.902446	0.952690
2000	---	---	0.889149	0.949972

As the table shows, the effect of raising PEL by 100 barrels per well day from its presumed level of 300 is greatest in Case 1, dropping the ELF from 0.245372 to 0.157103. This reduction of 0.088269 in the ELF represents a tax reduction of 35.974 percent as the result of rebutting the presumption (0.088269 is 35.974 percent of the 0.245372 value of the ELF in Case 1 if the presumption is not rebutted). The reduction from similarly raising the PEL from its presumed rate steadily drops off as the rate of current daily production per well gets larger: the ELF is reduced by 0.022997 for the 1,000 barrel-a-day Case 2 (corresponding to a tax reduction of 3.974 percent); by 0.000921 for the 5,000 barrel-a-day Case 3 (tax reduction of 0.101 percent), and by a mere 0.000230 for Case 4 (tax reduction of 0.024 percent), the case approximating Prudhoe Bay as expected after the completion of TAPS start up. In fact, in the Prudhoe-type case, even showing a PEL of 1,000 barrels a day per well (which is about what PEL was then expected to be if the Prudhoe Bay producers had rebutted the presumption) would only reduce the ELF by 0.001680 from its value with the presumed PEL. Rebuttal of the presumption thus represented a potential tax reduction of only 0.176 of one percent.

The decision to rebut or not rebut the presumed PEL is thus seen to have a rule of diminishing returns, the larger the average of current daily production per well becomes. With a property with extremely productive wells, the potential advantage from rebutting the presumption may simply be too small to be worth the effort even though the property is in a high operating cost area of the state.

C. The ELF's Incentive to Continue Development Drilling in "Mature" Fields. Recent (1986) proposals to modify the ELF so that the presumed PEL is on a field-wide or

reservoir-wide basis instead of a per-well basis have overlooked the incentive that the present ELF offers for producers to continue development drilling in mature fields that are already producing at their maximum efficient rate (MER). This incentive is best illustrated by examining a particular example, rather than trying to describe it abstractly.

Suppose there is a field that is producing at its MER, which is 1,500,000 barrels a day, or 45,000,000 barrels in a 30-day month. Since this is the MER for the field, the 45,-000,000 barrel figure will not change if another development well is drilled. Suppose further that there are already 500 producing wells in the field and that the presumption for PEL is unrebutted. What happens to the tax burden if the 501st development well is drilled?

Since the presumption for PEL is in effect, PEL can be replaced in the ELF formula by the expression [300 x WD]. Thus the formula becomes:

$$ELF = \{1 - ([300 \times WD]/TP)\}^{([460 \times WD]/[300 \times WD])}$$

Given how WD is in both the numerator and denominator of the exponent, it cancels itself out and the exponent can be simplified to 460/300. With 500 wells all operating every day in a 30-day month, the number of well days is 15,000. Using the simplified exponent and filling in the variables with the appropriate numerical values from this example, the ELF becomes:

$$ELF = \{1 - ([300 \times 15{,}000]/45{,}000{,}000)\}^{(460/300)}$$

$$= \{1 - (4{,}500{,}000/45{,}000{,}000)\}^{(460/300)}$$

$$= \{1 - (0.1)\}^{(460/300)}$$

$$= 0.850822$$

Now if the 501st well is drilled, the number of well days will become 15,030, and the new ELF will be:

$$ELF = \{1 - ([300 \times 15{,}030]/45{,}000{,}000)\}^{(460/300)}$$

$$= \{1 - (4{,}509{,}000/45{,}000{,}000)\}^{(460/300)}$$

$$= \{1 - 0.100200\}^{(460/300)}$$

= 0.850532

While the difference in the ELF seems small -- a reduction of 0.000290 in the value of the ELF, or 0.034 percent -- its dollars-and-cents effect is not insignificant. If the field is still in its first ten years of production, the nominal tax rate is 15 percent. If it costs $7.00 a barrel to get the oil to market, where it fetches $15.00, the "wellhead" value is $8.00. Assuming a one-eighth governmental royalty interest that is exempt from the Production Tax, the annual tax burden on this field with 500 wells would be:

Tax = (1,500,000 B/D) x (365 days) x (1 - 1/8 tax exempt share) x ($8.00/Bbl) x (15%) x (ELF of 0.850822)

= $489,116,297

Now with 501 wells the tax becomes:

Tax = (1,500,000 B/D) x (365 days) x (1 - 1/8 tax exempt share) x ($8.00/Bbl) x (15%) x (ELF of 0.850532)

= $488,949,583

In this example, drilling the 501st well results an annual savings of $166,714 39/ in the Production Tax. One must remember that the decision to drill each additional development well is a decision that must be made on its own merits. Past expenditures in developing the field may or may not have been good investments, but they are in any event irrelevant to the decision to spend additional money for further development. In contrast, a savings in the future Production Tax burden that will result from the drilling of an additional development well is definitely a factor to be weighed in the decision to drill that additional well or not, and it is one that helps tip the balance in favor of drilling it. Other favorable factors affecting the decision will be the ability to sustain production at the MER for a longer period of time if additional wells are drilled, and the likelihood that the amount of production ultimately

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39/ It should be apparent from the calculation that the exact amount of tax savings to be realized from drilling an additional development well is also dependent on other factors as well, particularly the "wellhead" price. If in the example the market price had been $25 instead of $15, the tax savings would have been considerably greater -- $375,106. Conversely, lower prices would have meant smaller tax savings.

recovered from the reservoir will be greater with more wells, both of which benefit the state as well as the taxpayer.

As this example shows, if the presumption regarding PEL has not been rebutted, all of the incentive provided under the present ELF is due to the fact that the presumed PEL is based on well days, which in turn depends on the number of development wells in operation. 40/ In other words, the only difference between the calculation of the ELF for 500 wells and the one for 501 wells is in the fact that there are 15,000 well days in the first and 15,030 in the second.

40/ It is a slightly different story if the presumption has been rebutted and PEL is established as a fixed number number of barrels per month. There is still an incentive to drill the 501st well, but this time it is due to the fact that the well-days factor still appears in the numerator of the exponent even though it is no longer a factor in PEL (the denominator of the exponent). To illustrate how the ELF provides a drilling incentive when the presumption has been rebutted, let us start with the same figures as in the example in the main text and suppose PEL has been shown to be 9,000,000 barrels per month. With 500 wells the ELF is:

$$ELF = (1 - 9{,}000{,}000/45{,}000{,}000)^{(460 \times 15{,}000)/9{,}000{,}000}$$

$$= (1 - 0.200000)^{6{,}900{,}000/9{,}000{,}000}$$

$$= 0.842757$$

With 501 wells the ELF becomes:

$$ELF = (1 - 9{,}000{,}000/45{,}000{,}000)^{(460 \times 15{,}030)/9{,}000{,}000}$$

$$= (1 - 0.200000)^{6{,}913{,}800/9{,}000{,}000}$$

$$= 0.842469$$

In this example the difference in the ELF between having 500 producing wells and 501 is 0.000288. It is coincidental that this figure comes out so close to the difference in the ELF from drilling the 501st well in the example in the main text with the unrebutted presumption about PEL. The point being made here is that, if the presumption is rebutted, the present ELF still provides an incentive to drill another well.

APPENDIX A

A Review of How Exponents Work

Exponents can be sorted into two kinds: whole numbered exponents (1, 2, 3 etc.) and fractional exponents (1/2, 1/3, 2/3 etc.). The whole numbered exponents are the easiest to understand. Basically, a whole numbered exponent states how many times a particular number is to be multiplied by itself. For example,

$$4^3 = 4 \times 4 \times 4, \text{ and}$$

$$6^7 = 6 \times 6 \times 6 \times 6 \times 6 \times 6 \times 6.$$

Whole number exponents are often called "powers" -- in the two examples above, the first is four to the third power, the second is six to the seventh power.

Now suppose we want to multiply two numbers together, each of which is some power of the same number. What happens? Suppose we want to take four to the third power and multiply it by four to the second power. We already know that four to the third power is four times four times four, and four to the second power similarly is four times four. Thus,

$$\begin{aligned} 4^3 \times 4^2 &= (4 \times 4 \times 4) \times (4 \times 4) \\ &= 4 \times 4 \times 4 \times 4 \times 4 \\ &= 4^5 \end{aligned}$$

Notice that the exponent, 5, in the last line equals the sum of the two exponents, 3 and 2, of the numbers being multiplied together. One may draw from this example the following generalization: if a number, A, to the N-th power is multiplied by A to the M-th power, the product is A to the "N plus M"-th power, or

$$A^N \times A^M = A^{(N+M)}$$

(Remember, though, that it must always be the same base number that is being taken to the different powers and mul-

tiplied together, for this generalization to be true. A to the N-th power times B to the M-th power does not equal A times B taken to the "N plus M"-th power, nor does it equal just A to the "N plus M"-th power or B to the "N plus M"-th power. As a generalized statement, A to the N-th power times B to the M-th power equals A to the N-th power times B to the M-th power, and that's as simple as the statement can be made and still be a generalized statement. In limited kinds of cases it can be made into a simpler statement, but only when there are special values for A and B or special values for M and N, or both.)

Exponents have a similar property when division is involved instead of multiplication. Suppose we wish to divide five to fifth power by five to the third power (the third power of a number is called its "cube"; five to the third power is "five cubed"). The following shows what happens:

$$\frac{5^5}{5^3} = \frac{5 \times 5 \times 5 \times 5 \times 5}{5 \times 5 \times 5}$$

$$= \frac{\cancel{5} \times \cancel{5} \times \cancel{5} \times 5 \times 5}{\cancel{5} \times \cancel{5} \times \cancel{5}}$$

$$= 5^2$$

Note that the exponent of the answer equals the difference between the exponent in the dividend (five to the fifth) and that in the divisor (five cubed). The generalization to be drawn from this example is that, when different powers of the same number are divided into each other, the exponent in the result equals the difference between those powers:

$$\frac{A^N}{A^M} = A^{(N - M)}$$

This generalized equation gives meaning to two special cases: the numbers one and zero when used as exponents. If N equals M plus one, then:

$$A^1 = A^{(N - M)}$$

$$= \frac{A^{N}}{A^{M}}$$

$$= \frac{A^{(M+1)}}{A^{M}}$$

$$= \frac{A^{M} \times A}{A^{M}}$$

$$= A$$

Thus, any number to the first power equals that number. (The preceding demonstration does not apply when A equals zero, because it would involve dividing by zero; however, the generalization still applies in the case of zero, so that zero to the first power is zero.)

Now, to get the zero-th power, N and M must be equal, and then the following happens:

$$A^{0} = A^{(N-M)}$$

$$= \frac{A^{N}}{A^{M}}$$

$$= \frac{A^{N}}{A^{N}}$$

$$= 1$$

Therefore, any number (except zero itself) raised to the zero-th power equals one.

Now, what happens if a number being raised to some power is itself the power of another number? For example, four is two to the second power (the second power of a number is its "square"; two to the second power is "two squared"). What is four cubed if it is converted into powers of two?

$$4^3 = 4 \times 4 \times 4$$

$$= (2^2) \times (2^2) \times (2^2)$$

$$= (2 \times 2) \times (2 \times 2) \times (2 \times 2)$$

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$= 2^6$$

In other words,

$$\left[2^2\right]^3 = 2^6$$

Notice that the exponent 6 in the answer equals 2 times 3. Once again this example gives rise to a generalization: if the quantity, A to the N-th power, is itself raised to the M-th power, the result equals A to the "N times M"-th power:

$$\left[A^N\right]^M = A^{(N \times M)}$$

When a number is raised to the N-th power, we are asking what the product is of multiplying one by that number N times. The N-th root of a number works the other direction. For a given number, it asks what number, when raised to the N-th power, will yield that given number. Thus, two is the cube root of eight, because two cubed (i.e., two times two times two) equals eight.

To show the N-th root of a number (call it A), the exponent is the fraction 1/N. The reason for having 1/N as the exponent to show the N-th root of a number is as follows: Let R stand for the N-th root of A. then by definition R to the N-th power equals A, or in mathematical terms:

$$R^N = A$$

Now let X stand for the exponent applied to A that is to be used to signify the N-th root of A; In other words, A to the X-th power equals the N-th root of A, which is R. In mathematical terms again, this is:

$$A^{X} = R$$

Substituting A to the X-th power in the second equation above gives the following:

$$R^{N} = \left[A^{X}\right]^{N} = A$$

Just a little bit above we showed that if the N-th power of a number is itself taken to the M-th power, the result equals that base number taken to the "N times M"-th power. Hence,

$$\left[A^{X}\right]^{N} = A^{(X \times N)} = A^{1} = A$$

Since A to the "X times N"-th power equals A to the first power, then the exponents, although expressed differently, must be equal. So, X times N equals one. Therefore, X equals one divided by N, or 1/N. Since R, the N-th root of A, equals A to the X-th power, and since X equals 1/N, then R equals A to the "1/N"-th power. Q.E.D.

It is now but a simple step to understand what fractional exponents do. If the exponent is a fraction, M/N, it simply means that the N-th root of the base number is found and then that root is raised to the M-th power, or alternatively, that the base number is first raised to the M-th power and then the N-th root is taken. In mathematical terms:

$$A^{(M/N)} = A^{[(1/N) \times M]} = \left[A^{(1/N)}\right]^{M}$$

or

$$A^{(M/N)} = A^{[M \times (1/N)]} = \left[A^{M}\right]^{(1/N)}$$

It does not matter which is done first, taking the N-th root or raising to the M-th power, as a brief example will show. Suppose we want to take eight to the two-thirds power. The cube root of eight is two, which when squared equals four. Now, reversing the order between taking the root and raising

to the power, the square of eight is 64; the cube root of 64 is four. Both ways, the answer is four.

Fractional exponents expressed in decimal terms are no different from any other fractional exponent. Thus,

$$A^{0.125}$$

is simply the 125th power of the 1,000th root (or equivalently, the 1,000th root of the 125th power) of A. If, as here, the fraction can be simplified (0.125 equals 1/8), there is no change in the result if the simpler fraction is substituted (nor would there be if a less simple form of the same fraction were substituted for a simple one). The 125th power of the 1,000th root of A is exactly equal to the eighth root of A:

$$A^{0.125} = A^{(1/8)}$$

February 2, 1986

THE PETROLEUM SEVERANCE TAX IN ALASKA: MODIFICATION OF THE ECONOMIC LIMIT FACTOR

Prepared by: Thomas Chester
Office of Management and Budget

Severance Tax

Alaska's petroleum severance tax is set by law at 15 percent[1] of the gross value of production, but this percentage is adjusted downward on the basis of the average productivity of the wells in a field. Only fields with extremely productive wells would pay the full 15 percent.

The Prudhoe Bay field now pays the full nominal severance tax rate of 15 percent, but only because of a special statutory provision that will expire in 1987 (FY '88[2]). At that time, the severance tax on Prudhoe Bay will begin to be adjusted downward in relationship to the declining average productivity of the wells in the field.

The formula for the downward adjustment of the nominal severance tax rate is called the economic limit factor (ELF). It is intended to encourage the maximum total production of an oil field by progressively lowering its effective severance tax as the field goes into decline.

ELF

Each field has its own ELF, which is computed monthly as a function of average daily output per well. Figure 1 shows this relationship. Fields with higher daily output have a higher ELF, and thus pay more tax. Figure 1 also indicates

the forecasted FY 88 average daily production of three North Slope fields and their associated ELFs.

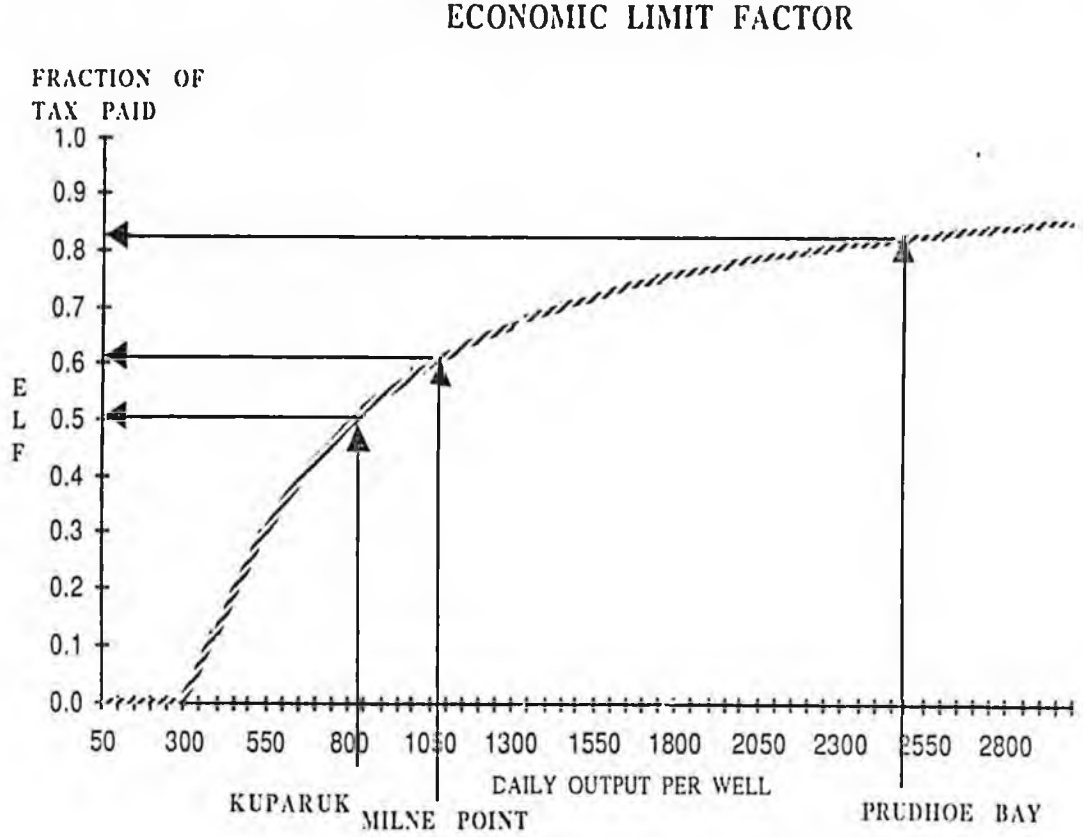


Figure 1

The actual severance tax rate paid (the effective severance tax rate) is equal to the ELF (which is always between 0 and 100 percent) multiplied by the statutory tax rate (usually 15%) . This produces the effective severance tax rates shown in Table 1 below.

Table 1

Effective Severance Tax Rates

North Slope Fields - FY 88, under current ELF

Field	ELF	X	Nominal Rate	=	Effective Rate
Prudhoe Bay	.82		15%		12.3%
Kuparuk	.52		15%		7.5%
Milne Point	.60		15%		9.0%

Modification of the ELF formula

The existing ELF formula is based on average daily well productivity and does not take account of the average daily production of the entire field. That is why the Prudhoe Bay and Kuparuk fields begin to enjoy the severance tax reduction even though they are among the most productive fields in the western hemisphere. Also, because the existing ELF formula fails to account for average daily field production, the Milne Point field will have a comparatively high ELF even though it is a very small and economically marginal field on the north slope.

A modification of the ELF formula that incorporates overall field production characteristics could increase the effective severance tax rate on large, productive fields such as Prudhoe Bay and Kuparuk, and reduce the effective tax rate

on the small, marginal fields that most need the economic benefits of the lower tax burden.

At the request of Rep. Cotten, OMB has evaluated the effects of one such modification.[3] Table 2 shows the change in the effective tax rate for several oil fields. Table 3 shows the revenue implications of those changes.

Modification of the ELF formula to include total field productivity would improve the chances of a small, marginal field being brought into commercial production. These fields may have good well productivity characteristics but high costs because of the inability to spread fixed costs over a large number of producing wells (as in the case of Prudhoe Bay and Kuparuk).

Table 2

COMPARISON OF ELF'S

FY 89

	Existing ELF	Modified ELF	% change
Prudhoe Bay	.80	.99	+23%
Kuparuk	.50	.86	+72%
Milne	.60	.31	-48%
Endicott	.31	.0	-100%
Lisburne	.11	.05	-54%
West Sak	.0	.0	no change
Cook Inlet	.03	.0	100%

M E M O R A N D U M

STATE OF ALASKA

Department of Revenue

Petroleum Research Section

February 11, 1987

To: Vincent D. Wright, Chief of Research

From: Charles Logsdon, Petroleum Economist

Subject: New ELF

Per your request, I have examined the revenue and production impacts associated with changing the ELF to consider field size. This modification is similiar to the one outlined in HB 545 and presented in analysis done by myself in papers prepared for presentation to the tax committee.

Briefly, the modification is accomplished by introducing a scaling factor and also the rate of field production into the exponent of the current ELF formula. The value of this scaling factor determines at what level of production the resulting ELF is greater than under the current law. For instance, in HB 545 the factor has a value of 37,000,000 which, given a PEL of 300, translates into a break point of roughly 80,000 bbls/day. The analysis I did for the tax committee last December under the OMB modified alternative ELF used a factor with a value of 45,500,000. This translates into a break point of roughly 100,000 bbls./day. In the analysis contained in this memo I have used a factor value of 55,000,000, which results in a break point of roughly 120,000 bbls./day. A breakpoint of 120,000 bbls./day would increase the effective severance tax rate on Prudhoe Bay and Kuparuk production. It would reduce the effective severance tax rate on all other oil fields now producing or likely to produce in the next two years, including all Cook Inlet fields, Milne Point, Lisburne, and Endicott. This is because none of these fields are projected to produce at or above the 120,000 bbl./day level. I have attached a computer printout which illustrates the sensitivity of the change in effective tax rate on each field of different assumptions for production and well count using the 55 million scaling factor

Sam's Copy

To illustrate the effect of different scaling factors on the ELF calculation I have developed the following tables. The first table illustrates the break point for various values of the scaling factor i.e. the total field production which would result in a lower ELF than that currently calculated.

Factor	Breakpoint
20000000	43479 bbls./day
30000000	65219
40000000	86958
50000000	108698
60000000	130438
70000000	152177
80000000	173917
90000000	195656
100000000	217396
110000000	239136

The following table shows the calculated ELF by North Slope field for various values of the scaling factor.

			Factor/ELF							
Field	Prod.	Prod/Well	30MM	40MM	50MM	60MM	70MM	80MM	90MM	100MM
Prudhoe	1510000	2900	.9928	.9904	.9880	.9856	.9833	.9809	.9785	.9762
Kuparuk	230000	885	.8353	.7866	.7408	.6977	.6571	.6188	.5828	.5488
Milne	20000	900	.1317	.0670	.0341	.0173	.0088	.0045	.0023	.0012
Endicott	70000	900	.5603	.4619	.3808	.3140	.2588	.2134	.1759	.1450
Lisburne	35000	1400	.5021	.3990	.3171	.2521	.2003	.1592	.1266	.1006
West Sak	100000	550	.4545	.3495	.2687	.2066	.1589	.1221	.0939	.0722

The following two tables illustrate the revenue and production impact of modifying the ELF to include field size in the formulas using the 55 millon scaling factor. The results were generated by the PETREV monte carlo simulation model that DOR uses to forecast petroleum production revenues. Interestingly the revenue impacts are not that much different from those contained in the fiscal note prepared last year concerning HB 545. The average expected production impacts are also relatively low. The mildly negative impact on Lisburne production is a result of a slightly higher TAPS tariff, due to slightly lower throughput, more than offsetting the lower severance tax burden. The negative impact on West Sak reflects the probability that should this project become economic, production may exceed 120,000 bbls/day from a large number of low productive wells.

Revenue Impact of Field Size ELF, Field Factor = 55 Million
(Millions $)

Fiscal Year	Delta 30%	Delta Mean
1987	10.45	10.93
1988	88.18	112.29
1989	98.14	136.23
1990	109.61	147.04
1991	96.13	132.35
1992	94.18	127.23
1993	91.30	124.34
1994	81.51	118.59
1995	77.60	112.06
1996	69.74	98.74
1997	62.21	92.73
1998	49.52	82.14
1999	43.91	75.70
2000	33.42	72.90
2001	31.73	72.49
2002	27.43	73.42
2003	28.46	73.09
2004	23.53	62.25
2005	20.23	47.44

Table 3
Revenue Impact
from ELF, FY 87 - 94
Millions of $

Year	Revenue Loss From Current ELF	Revenue Gain From Proposed ELF
87	70	68
88	234	183
89	263	185
90	243	180
91	241	172
92	324	169
93	332	166
94	340	155

FOOTNOTES

[1]For any lease or property coming into commercial oil production after June 30, 1981, the severance tax rate is 12.25% during the first 5 years of production and 15% after that. (AS 43.55.011)

[2]This special statutory provision applies to all fields.

[3]

EXISTING ELF

$$ELF = (1 - PEL/TP)^{(460*WD/PEL)}$$

POSSIBLE ALTERNATIVE

$$ELF = (1 - PEL/TP)^{(37,000,000/(PEL*TP/Days))}$$

Where:
- PEL is production at the economic limit and in statute is set at 300 barrels per day per well
- TP is total production for the field
- WD is well days
- 460 and 37,000,000 are constants

Questions and Answers on the "ELF"

What does the ELF bill do?

A provision in current law will reduce Prudhoe Bay severance taxes on June 20, 1987. The Governor's bill (HB-164 and companion SB-158) will prevent this reduction. The bill also deletes another section of the current law which could allow oil producers to avoid severance tax payments entirely.

How much would Alaska lose from the cut in Prudhoe taxes?

The Department of Revenue estimates the fiscal year (FY) 1988 loss at $93 million, or $77 million under the more conservative "30 percent" forecast. The reduction is already accounted for in the official forecasts, so adopting the bill will be reflected in future forecasts as a revenue increase -- $92 million, $98 million, $100 million, $106 million in FY 1989-92, respectively.

Some industry sources say the bill will have a bad effect on future development? Will the bill impact future production?

Yes, but the impact won't be large. A Department of Revenue analysis shows that allowing the tax cut to go into effect could boost total North Slope output during FY 1988 by 1 million barrels -- equal to 13 hours of flow through the TAPS pipeline. Effects taper off in later years. The total impact over the next 20 years is pegged at 10 million barrels, equal to 5 days TAPS output at current rates.

How did we get this provision in our law, and why does it take effect on June 20?

In 1981, the legislature amended the oil and gas corporate income tax and the severance tax. By changing from separate accounting to modified apportionment the act reduced income taxes for Prudhoe Bay producers. Legislators were assured -- incorrectly, as it turned out -- that most of this reduction would be offset by other provisions. These included a severance tax amendment which had the effect of suspending the applicability of the economic limit factor (ELF) to Prudhoe Bay "for the first ten years following the commencement of commercial production." The tenth anniversary will come on June 20 of this year. Since the ELF is a formula that reduces severance tax rates by variable amounts, depending on per-well production, suspending the ELF had the effect of increasing the tax.

How does the ELF formula work to reduce taxes?

The ELF is alway a number between 1 and zero that gets multiplied times the nominal tax rate, producing the effective tax rate. This number is determined by the per-well productivity of the field. If the productivity is high, the ELF is relatively close to 1.0, and the field gets a small tax break. Fields with low per well productivity get a smaller ELF, and a larger tax break. For example, most fields in Cook Inlet are currently paying no severance tax because their low production per

well gives them ELFs of zero. (Zero times the nominal tax rate of 12.25 percent gives an effective rate of 0.0 percent.).

When the ELF is calculated for Prudhoe it comes out to about .84, but (because of the 1981 amendments) during the first ten years of production the ELF doesn't apply to that field unless it is below .70, which is not expected to happen for some years. The Governor's bill simply retains the status quo for an additional five years.

Didn't legislators realize in 1981 that this "ten year" business would cause us problems later?

Most legislators were probably unaware of the potential problem. The proposal was first unveiled to a free conference committee on June 22, and was adopted as the Free Conference Committee Substitute the next day. On June 24 it passed both houses and was on its way to the governor. Obviously there was little time to study the bill. The fiscal note included no projections beyond FY 1985.

A post-session analysis by the Legislative Finance Division did show that the ELF provision would cause state revenue to fall sharply in FY 1988. Governor Hammond acknowledged this when he signed the bill, but expressed "full confidence in the ability of the legislature to deal at that time" with adverse revenue consequences, should they prove to be serious.

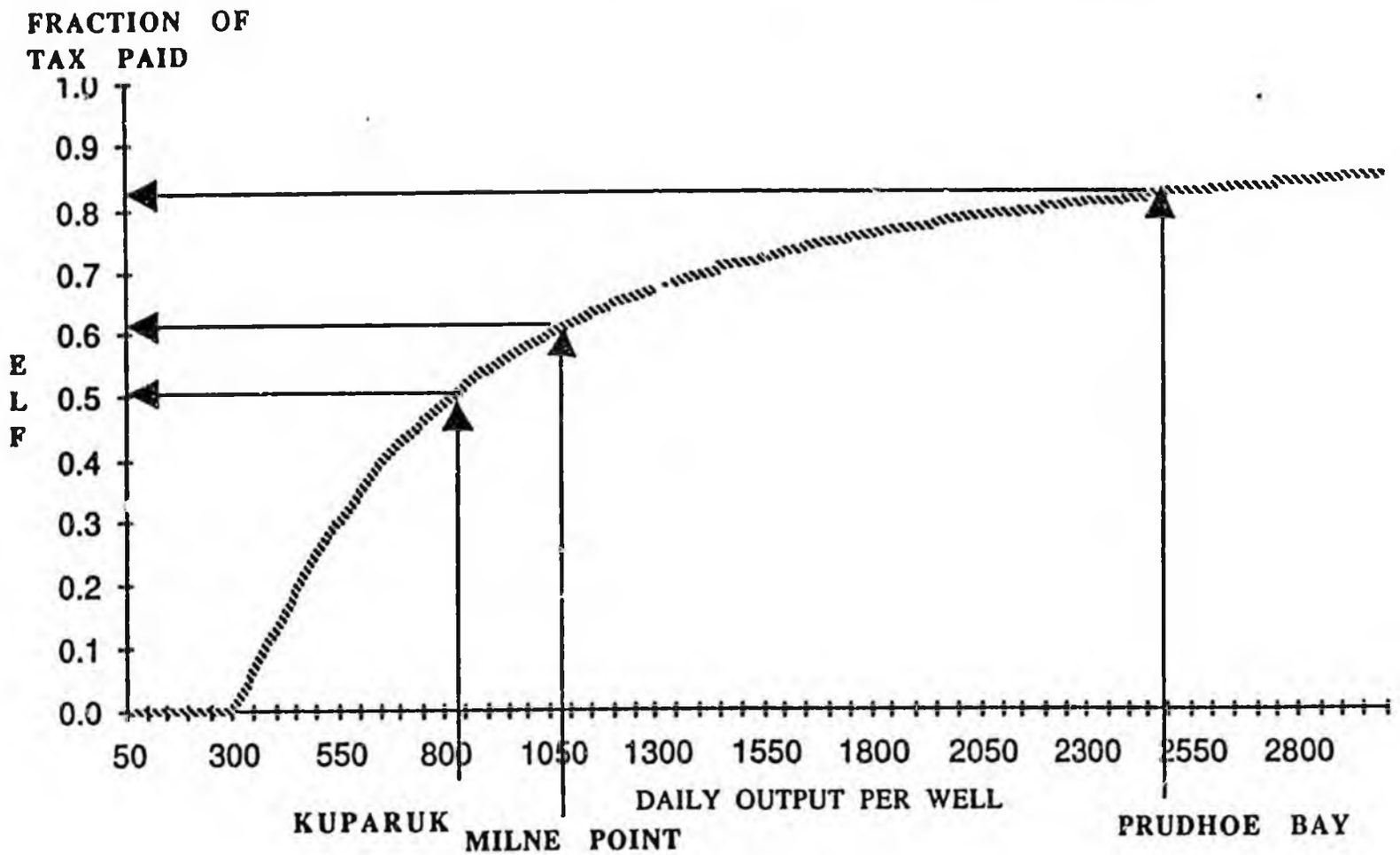
What about the other provision in the ELF bill?

As the law now stands, in a period of very low oil prices producers could conceivably request, and the Department of Revenue could be required to grant, increases in the "presumed production at the economic limit" or PEL, a factor used in calculating the ELF. Other provisions in current law together with an increase in the PEL could open a "trap door" through which Prudhoe producers or other oil taxpayers might entirely escape severance tax. This could have a drastic financial effect on the state. By fixing the PEL at 300 barrels per well per day, the Governor's bill will foreclose this possibility.

The change has no immediate revenue impact, since all currently producing fields are already operating under the 300 barrel presumption. The change would likely affect the Milne Point field should it be reopened, since the PEL adjustment requested last year would no longer be allowed.

OMB/Division of Policy, 3/16/87

ECONOMIC LIMIT FACTOR



CASE 1

HOW THE ELF IS CALCULATED

ELF = (1 - [PEL/TP])exp(460*WD/PEL)

PEL = (Production at the Economic Limit) =
(300 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = 300 barrels * 541 wells * 30 days = 4,869,000 barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(460* WD / PEL)

ELF = (1 - [4,869,000/40,201,710])exp(460*16,230/4,869,000)

ELF = (1 - .1211) exp (1.533)

ELF = (.8789) exp (1.533)

ELF = .82

CASE 4

WHAT HAPPENS WHEN THE PEL CONSTANT IS INCREASED?

ELF = (1 - [PEL/TP])exp(460*WD/PEL)

PEL = (Production at the Economic Limit) =
(400 barrels per day)*
(average number of operating wells during the month)*
(number of days of production for the month).

EXAMPLE

PEL = 400 barrels * 541 wells * 30 days = 6,492,000 barrels per month

TP = (Total Production for the field for the month) =
(average number of operating wells during the month)*
(number of days of production for the month)*
(average daily production per well).

EXAMPLE

TP = 541 wells * 30 days * 2477 barrels per well = 40,201,710 barrels per month

WD = (Well Days) =
(number of operating wells during the month)*
(number of days each well operates)

EXAMPLE

WD = 541 wells * 30 days = 16,230 well days

CALCULATION EXAMPLE

ELF = (1 - [PEL / TP])exp(460* WD / PEL)

ELF = (1 - [6,492,000/40,201,710])exp(460*16,230/6,492,000)

ELF = (1 - .1615) exp (1.150)

ELF = (.8385) exp (1.150)

ELF = .816 RESULT: A DECREASE IN THE TAX

STANDARD ALASKA PRODUCTION COMPANY

TESTIMONY

ON

House Bill 164

March 19, 1987

MY NAME IS BOB VAN HOOK. I AM TAX COUNSEL AT STANDARD ALASKA PRODUCTION COMPANY. WITH ME IS JIM PALMER, MANAGER OF GOVERNMENTAL AFFAIRS.

I'D LIKE TO START WITH A COMMENT ABOUT SEVERAL SUCCESSES IN ALASKA'S OIL INDUSTRY. THESE SUCCESSES HAVE BEEN GIVEN LITTLE NOTICE IN THIS PERIOD OF FALLING PRICES, BUT BY WORLD STANDARDS ARE REMARKABLE. THREE MAJOR PROJECTS WILL COMMENCE PRODUCTION BETWEEN DECEMBER 1986 AND DECEMBER 1987. THE PROJECTS ARE LISBURNE, ENDICOTT, AND THE CENTRAL GAS FACILITY AT PRUDHOE. THE CENTRAL GAS FACILITY ACTUALLY COMPRISES TWO PROJECTS. THE FIRST EXTRACTS NATURAL GAS LIQUIDS FROM A GAS STREAM AND COMBINES THE NATURAL GAS LIQUIDS WITH BLACK OIL SHIPPED DOWN TAPS. THE SECOND MANUFACTURES AND INJECTS MISCIBLE FLUID INTO THE RESERVOIR TO INCREASE RECOVERY. COLLECTIVELY, ADDITIONAL RECOVERY FROM THESE PROJECTS IS ESTIMATED TO BE 1.4 BILLION BARRELS. THE COST OF THE PROJECTS IS ESTIMATED AT $3.5 BILLION.

THESE PROJECTS DEMONSTRATE THAT THE OIL INDUSTRY HAS REINVESTED LARGE SUMS IN ALASKA AND HAS SIGNIFICANTLY INCREASED RECOVERY.

MOVING NOW TO H.B. 164: THIS BILL ESSENTIALLY LEAVES THE ECONOMIC LIMIT FACTOR OR ELF IN PLACE AT ALL FIELDS EXCEPT PRUDHOE. THIS SEEMS TO REFLECT THE THEORY THAT THE ELF IS GENERALLY A GOOD THING BUT IS UNNEEDED AT PRUDHOE. SAPC BELIEVES THAT THE ELF IS IMPORTANT FOR PRUDHOE AS WELL AS OTHER FIELDS. THIS BILL IS

ESPECIALLY IMPORTANT TO SAPC BECAUSE OF THE GREATER THAN 50% INTEREST THAT STANDARD HAS IN PRUDHOE.

ALASKA'S NOMINAL PRODUCTION (OR SEVERANCE) TAX RATE OF 15% IS THE HIGHEST IN THE NATION. LOUISIANA IS SECOND AT 12.5%. OKLAHOMA HAS A 7% RATE; TEXAS HAS A 4.6% RATE AND CALIFORNIA DOES NOT HAVE A PRODUCTION TAX. PRODUCTION TAX IS AN INCREASINGLY BURDENSOME TAX IN HIGH COST AREAS. THIS IS BECAUSE THE TAX IS BASED ON WELLHEAD VALUE WITHOUT ANY REDUCTION FOR OPERATING COSTS OR CAPITAL COSTS. THE ELF HAS THE EFFECT OF REDUCING THE PRODUCTION TAX RATE AS THE FIELD MATURES. DURING THIS PERIOD OF DECLINING PRODUCTION, OPERATING COSTS PER BARREL INCREASE AND CAPITAL COSTS RELATING TO ADDITIONAL RECOVERY INCREASE.

THE ELF ACTUALLY ENCOURAGES FULL FIELD DEVELOPMENT. ONE EXAMPLE IS THE DRILLING OF WELLS. THE ADDITION OF WELLS CONSISTENT WITH SOUND ECONOMIC AND RESERVOIR MANAGEMENT WILL GENERALLY INCREASE ULTIMATE RECOVERY WITHIN A FIELD BUT DECREASE SLIGHTLY THE AVERAGE PRODUCTION PER WELL WITHIN THE FIELD. THE ELF WILL DECREASE SLIGHTLY AS THE PRODUCTION PER WELL DECREASES. OVERALL THEN THE STATE WILL COLLECT TAXES ON MORE BARRELS.

THE HIGH SEVERANCE TAX RATE OF 15% WITHOUT ELF RELIEF CAN BE A SUBSTANTIAL LIMITATION ON MARGINAL PROJECTS OTHER THAN WELL DRILLING. FUTURE ENHANCED OIL RECOVERY PROJECTS ARE VERY EXPENSIVE YET MAY RESULT IN SIGNIFICANT ADDED RECOVERY, MORE RECOVERY IN SOME INSTANCES THAN ENTIRE FIELDS WHICH THE STATE IS APPARENTLY TRYING TO ENCOURAGE. INCREASING THE EFFECTIVE SEVERANCE TAX RATE ON THE FIELD CAN RESULT IN THESE MAJOR PROJECTS NOT BEING PURSUED.

H.B. 164 CHANGES THE EXISTING TAX STRUCTURE. THIS CHANGE WILL MAKE JUSTIFICATION OF FUTURE INVESTMENTS EXTREMELY DIFFICULT. THE TAX RATE WILL BE SUBSTANTIALLY HIGHER FOR 5 YEARS WITH A SEEMINGLY HIGH POTENTIAL FOR ANOTHER INCREASE WHEN THAT 5 YEARS IS UP. BETWEEN $460 MILLION AND $610 MILLION WILL BE TAKEN FROM PRUDHOE OWNERS AND WILL NOT BE AVAILABLE FOR REINVESTMENT. THIS TAX INCREASE COMES AT THE TIME PRUDHOE FACES DECLINE AND LOW PRICES, AND AT THE TIME NEW, VERY EXPENSIVE TECHNOLOGIES ARE BEING DEVELOPED WHICH COULD HAVE APPLICATION TO THE 12 BILLION BARRELS CURRENTLY CONSIDERED UNRECOVERABLE AT PRUDHOE.

GREAT RELIANCE IS BEING PLACED ON THE LOST PRODUCTION FIGURES GENERATED BY THE DEPARTMENT OF REVENUE. PRUDHOE HAS 12 BILLION BARRELS WHICH ARE CURRENTLY CONSIDERED UNRECOVERABLE. TECHNOLOGIES ARE BEING DEVELOPED WHICH MAY BE ECONOMIC AT PRUDHOE. STANDARD SERIOUSLY DOUBTS THAT THE DEPARTMENT OF REVENUE MODEL CAN FAIRLY PREDICT THIS TECHNOLOGICAL PROGRESS. MAJOR PROJECTS COULD BE FOREGONE.

IN ANALYZING A PROJECT, THERE ARE TWO MAJOR CONSIDERATIONS:

1. IS THE PROJECT ECONOMIC?

2. ARE OTHER PROJECTS MORE ECONOMIC IN USING THE FUNDS AVAILABLE?

THE DEPARTMENT OF REVENUE MODEL DOES NOT CONSIDER ALTERNATIVE PROJECTS AND DOES NOT CONSIDER WHETHER FUNDS ARE AVAILABLE. OVERALL, STANDARD BELIEVES THAT AN ACCURATE MODEL PREDICTING LOST PRODUCTIONS CANNOT BE DEVELOPED AND THAT THE SENSE OF SECURITY GENERATED BY THE DEPARTMENT OF REVENUE FIGURES IS A FALSE SENSE OF SECURITY.

THIS BILL WOULD ALSO ELIMINATE THE PEL CHALLENGE. SAPC OPPOSES THIS CHANGE AND BELIEVES THAT FIELD LIFE WILL BE SHORTENED AND TOTAL PRODUCTION REDUCED IF THE PEL CHALLENGE IS ELIMINATED.

IN CONCLUSION SAPC WOULD LIKE TO EMPHASIZE TWO POINTS.

1. THE OIL INDUSTRY HAS CONTINUED TO MAKE MAJOR CAPITAL INVESTMENTS IN ALASKA WITH SUBSTANTIAL ADDITIONAL RECOVERY RESULTING.

2. REMOVAL OF THE ELF AT PRUDHOE COULD SUBSTANTIALLY DECREASE ULTIMATE RECOVERY FROM THAT FIELD AND WILL CHANGE THE EXISTING TAX STRUCTURE MAKING JUSTIFICATION OF FUTURE INVESTMENTS EXTREMELY DIFFICULT.

Testimony of

EXXON COMPANY, U.S.A.

by D. E. Cornell

Joint House Resources and

Finance Committee Hearing

House Bill 164

March 19, 1987

I am Don Cornell, Alaska Coordinator for Exxon Company, U.S.A. I appreciate the opportunity to speak before you today and explain Exxon's basis for opposing house bill 164. Obviously it would result in a significant tax increase at a time when we are still in the severe impacts of last year's crude price collapse. Passage of this bill would not only add to our costs, but would also be a strong negative signal for future petroleum exploration and development. On that basis, it would be contrary to the state's best interest as a whole.

As you know, depressed crude prices have forced dramatic cutbacks in the oil and gas industry, such as a 48% reduction in domestic capital spending over the last two years. A quick look at the North Slope bears this out. Prudhoe Bay's west end development has been deferred at least a year; drilling activity has been reduced from thirteen rigs to five; and perhaps the most dramatic example is the shut-in of the Milne Point field.

Even under current law, Alaska places a very high tax burden on the industry. One way to view this is to look at the rising state share of industry's net revenues. Using estimates from the Department of Revenue's December 1986 petroleum income tax study, the state's share of 1987 petroleum production net income would have been 35% for a $20 wellhead price. At the current wellhead price of $9 per barrel, the states share jump. to 73%.

While Alaska wrestles with the question of whether or not to increase its severance taxes, states such as Texas, Wyoming, North Dakota, Montana, Mississippi, Kansas and Oklahoma are considering measures for severance tax relief to help stimulate exploration and production.

House Bill 164 goes in the opposite direction. It increases the industry's tax burden by modifying the Economic Limit Factor used to calculate the effective severance tax rate. In the proposed Committee substitute, taxes on the state's largest fields would be significantly increased while those on smaller fields would be reduced by a lesser amount, apparently on the assumption that large fields can absorb higher costs. This assumption is incorrect. The Prudhoe Bay field simply can't absorb what appears to us to b a multi-billion dollar tax increase without a negative effect on future investments in the state.

As I have said before, industry is already having a hard time justifying new projects at Prudhoe Bay. Additional wells, enhanced oil recovery, West End development and other projects seeking to recover some of the 10 billion barrels of oil beyond the reach of the existing development would be hardest hit by such a tax change. Enactment of this legislation will raise the minimum crude price needed to justify each new project at Prudhoe Bay. Loss or deferral of such projects would have long term negative impacts both on employment and on state royalty and tax revenues.

Tax stability is needed in Alaska. Severance taxes have been increased five times since statehood, four of which occurred since the discovery of the Prudhoe Bay field. By changing the tax rules once again in the middle of the game, the state would add considerable uncertainty to all future projects at Prudhoe Bay and elsewhere. This would add a significant economic hurdle to our efforts to justify Alaska projects.

Exxon looks forward to continued participation in petroleum projects in Alaska. More exploration is needed to determine this state's hydrocarbon potential, and important investment decisions confront us to recover marginal production from Prudhoe Bay and to fully develop the Endicott and Lisburne fields. But with the current economic environment, such projects will be more difficult to justify than in previous years.

Exxon appreciates the fiscal challenge facing the state. We share it and have had to undertake an enormous r structuring, cut spending, and reduce our workforce to meet the challenge. But higher taxes would simply leave us with less money to spend in Alaska and would send a strong signal of tax instability that would discourage future resource development decisions. Turning to the oil industry for more revenue today is in neither the state's nor industry's long-term best interest.

JDH/4200B:dag

3/16/87

State of Alaska
MEMORANDUM

Office of the Governor

Division of Policy

P.O. Box AM, Juneau, AK, 99811
Tel. 465-3568 / Mail Stop 0164

TO: Rep. Drew Pearce DATE: 19 March 1987

FROM: Gregg Erickson
Senior Economist

SUBJECT: Shares of Alaska Oil Revenue.

I have enclosed OMB's most recent (April 11, 1986) analysis of the shares of net revenue from oil production and transportation in Alaska during the FY 82-85 period. Oil industry Alaska profits over this 4-year period (net of capital charges, costs, royalties and taxes) totaled $22,103 million.

The profits earned in Alaska can be compared with the $6 billion in oil industry invested in Alaska over the same period. Testimony of Harold Heinze, House Finance transcript, April 12, 1985, p. 130.

I have also provided copies of our correspondence with Exxon regarding the "shares" analysis.

cc: Rep. Cotten
Mary Halloran

STATE, FEDERAL AND INDUSTRY SHARES OF ALASKA OIL RESOURCE INCOME: FISCAL 1982-1985

(millions of dollars except as noted)

Fiscal year	[1] Total Revenue	[2] State Royalty	[3] Sever. Conser. tax	[4] Total Prop. tax	[5] Total Oper. Costs	[6] Total Deprec.	[7] Total Acquis. Costs	[8] Windfall Profits Tax
1982	$16,456	$1,553	$1,581	$276	$940	$602	$1	$2,018
1983	$15,470	$1,448	$1,494	$307	$1,101	$780	$1	$1,018
1984	$14,955	$1,409	$1,393	$358	$1,259	$998	$1	$412
1985	$15,136	$1,390	$1,389	$397	$1,449	$1,093	$1	$70

Fiscal Year	[9] Uncap. Interest Expense	[10] Explore. Costs	[11] Admin. Costs	[12] Other Deducs.	[13] Total Deducs.	[14] State Taxable Net Income	[15] Corp. Petrol Income Tax	[16] Federal Taxable Income
1982	$721	$191	$236	$149	$8,268	$8,188	$669	$7,519
1983	$676	$204	$252	$142	$7,423	$8,047	$236	$7,811
1984	$614	$219	$265	$136	$7,064	$7,891	$265	$7,626
1985	$566	$234	$278	$130	$6,997	$8,139	$169	$7,970

Fiscal Year	[17] Federal Corp. Income Tax	[18] Oil Industry Alaska Profits	[19] Total Federal Tax	[20] Total State Tax & Royalty	[21] ----Share of Oil Income---- State	[22] Federal	[23] Industry
1982	$2,098	$5,421	$4,116	$4,079	30%	30%	40%
1983	$2,140	$5,671	$3,158	$3,485	28%	26%	46%
1984	$2,242	$5,384	$2,654	$3,425	30%	23%	47%
1985	$2,343	$5,627	$2,413	$3,345	29%	21%	49%

SOURCES AND FORMULAS --

Column [1]: Vincent Wright, chief of research, to Mary Nordale, Commissioner of Revenue, Memorandum of October 31, 1985, Table 3.

Columns [2] & [3]: January 1986 DOR Revenue Sources, p. 39.

Columns [4] to [12]: Vincent Wright, loc. cit.

Column [13]: sum of columns [2] through [12]

Column [14]: column [1] - column [13]

Column [15]: Revenue Sources, p. 39.

Column [16]: column [14] - column [15].

Column [17]: column [16] * (production-weighted average tax rate -- 1982 = .279; 1983 = .274; 1984 = .294; 1985 = .294). Company effective rates for '82-84 from R. McIntire and R. Folen, "Corporate Income Taxes in the Reagan Years," Oct. 1984, pp. 32-36; '85 estimated by OMB.

Column [18]: column [16] - column [17].

Column [19]: column [8] + column [17].

Column [20]: sum of columns [2], [3], [4], and [15].

Column [21]: (column [18])/(sum of columns [18], [19], and [20]).

Column [22]: (column [19])/(sum of columns [18], [19], and [20]).

Column [23]: (column [20])/(sum of columns [18], [19], and [20]).

Office of Management and Budget
Division of Strategic Planning
revised April 11, 1986

TESTIMONY OF MARK L. HAZELWOOD

BEFORE THE HOUSE RESOURCES AND FINANCE COMMITTEES

CONCERNING MODIFICATIONS TO THE ECONOMIC LIMIT FACTOR OF

THE ALASKA OIL & GAS PROPERTIES PRODUCTION TAX (HB 164 & CSHB 164)

THURSDAY - MARCH 19, 1987

GOOD MORNING. MY NAME IS MARK L. HAZELWOOD AND I AM THE VICE PRESIDENT OF FINANCE, PLANNING & CONTROL FOR ARCO ALASKA, INC. I APPRECIATE THE OPPORTUNITY TO OFFER TESTIMONY TODAY CONCERNING SEVERAL PROPOSED MODIFICATIONS TO THE ECONOMIC LIMIT FACTOR OF THE ALASKA OIL AND GAS PROPERTIES PRODUCTION TAX. THE TWO BILLS CURRENTLY BEFORE YOU ARE HB 164 INTRODUCED AT THE REQUEST OF THE ADMINISTRATION AND CS HB 164, PROPOSED YESTERDAY.

I AM CERTAIN THAT IT WILL COME AS NO SURPRISE TO YOU THAT ARCO ALASKA OPPOSES ANY MODIFICATIONS TO THE ECONOMIC LIMIT FACTOR (ELF)

WHICH WOULD HAVE THE EFFECT OF INCREASING THE OIL AND GAS INDUSTRY'S TAX BURDEN. WE DO RECOGNIZE, HOWEVER, THAT YOU ARE FACED WITH BALANCING A NUMBER OF DIFFICULT AND, TO SOME EXTENT, CONFLICTING POLICY OBJECTIVES. IN THE COURSE OF ADDRESSING THE STATE'S NEAR TERM BUDGET DEFICIT PROBLEMS, YOU WILL BE CHALLENGED TO CAREFULLY CONSIDER THE IMPACT OF LEGISLATIVE PROPOSALS ON THE STATE'S RESOURCE DEVELOPMENT, CONSERVATION AND TAX POLICIES. HOPEFULLY, THE TESTIMONY THAT I AND OTHERS PRESENT TODAY WILL ASSIST YOU IN YOUR DELIBERATIONS.

A LITTLE OVER A YEAR AGO, I APPEARED BEFORE THE HOUSE FINANCE COMMITTEE AND PRESENTED TESTIMONY CONCERNING HB 545, A BILL WHICH WOULD HAVE MADE SIGNIFICANT CHANGES TO THE ECONOMIC LIMIT FACTOR. THE MODIFICATIONS PROPOSED IN HB 545 ARE SIMILAR IN MANY WAYS TO CHANGES BEING PROPOSED IN COMMITTEE SUBSTITUTE FOR HB 164. AS A RESULT, MY TESTIMONY OF LAST YEAR HAS APPLICATION TO THE LEGISLATIVE PROPOSALS WHICH ARE UNDER CONSIDERATION TODAY. IN THAT EARLIER TESTIMONY I FOCUSED ON THE INNER WORKINGS OF THE ELF AND ITS IMPORTANCE IN MITIGATING THE REGRESSIVE NATURE OF THE ALASKA PRODUCTION TAX BY TAKING INTO ACCOUNT THE ECONOMIC REALITIES OF OIL

FIELD OPERATIONS. THE CURRENT ELF IS PREMISED ON THE NOTION THAT AS THE PRODUCTION RATE PER WELL DECLINES, THE PRODUCER'S TAX BURDEN SHOULD DECREASE SO AS NOT TO DISCOURAGE CONTINUED INVESTMENT AND OPERATIONS.

ADDITIONALLY, I POINTED OUT IN MY EARLIER TESTIMONY THAT CHANGES TO THE ELF WHICH HAD THE EFFECT OF INCREASING THE OIL INDUSTRY'S TAXES RAN COUNTER TO THE OFTEN RECITED POLICY OBJECTIVES OF BROADENING THE STATE'S TAX BASE AND OF BECOMING LESS DEPENDENT ON INCOME DERIVED FROM A SINGLE INDUSTRY. I ALSO TESTIFIED THAT THE TIMING WAS PARTICULARLY TROUBLESOME GIVEN THE VERY DIFFICULT CHALLENGES THAT THE INDUSTRY WAS ANTICIPATING AS A RESULT OF FALLING CRUDE PRICES. BASED ON DOWNWARD CHANGES TO THE LEADING INDICATORS OF OIL AND GAS ACTIVITY THROUGHOUT OUR NATION, BOTH THE INDUSTRY AND THE STATE FACED A RATHER BLEAK OUTLOOK LAST FEBRUARY. BECAUSE THE PRICE OF CRUDE HAD ONLY BEGUN ITS PRECIPITIOUS DECLINE AND BECAUSE THE STATE HAD NOT YET REVISED ITS REVENUE FORECASTS DOWNWARD, MY TESTIMONY WAS MET WITH SOME SKEPTICISM AND THOUGHTS OF OVER-EXAGGERATION. IN RETROSPECT,ALMOST EVERYONE (INCLUDING MYSELF) FAILED TO ANTICIPATE JUST HOW SEVERE THE FALL IN CRUDE

PRICES WOULD BE AND HOW SIGNIFICANT AN IMPACT THIS DECLINE WOULD HAVE ON OUR INDUSTRY AND ON THE STATE.

IN MY TESTIMONY TODAY, I DO NOT INTEND TO DEVOTE ANY SIGNIFICANT AMOUNT OF TIME TO THE MECHANICS OF THE ELF OR TO DWELL UNNECESSARILY ON THE TAX POLICY ISSUES UNDERLYING THE ELF. THE TESTIMONY I PRESENTED LAST YEAR CONTINUES TO EXPRESS ARCO'S VIEWS ON THOSE ASPECTS OF THE ELF. I DO HAVE COPIES OF THAT TESTIMONY WITH ME TODAY IF YOU WOULD LIKE TO HAVE ONE.

I WOULD INSTEAD LIKE TO DEVOTE MY TESTIMONY THIS MORNING TO THE PROPOSITION THAT THE NEAR AND LONG TERM ECONOMIC WELFARE OF THE INDUSTRY AND THE STATE OF ALASKA ARE INEXTRICABLY LINKED. ACCORDINGLY, ANY CHANGE IN THE TAX LAWS WHICH ADVERSELY AFFECTS THE INDUSTRY'S ABILITY TO FULLY DEVELOP THE STATE'S OIL AND GAS RESOURCES IS DETRIMENTAL BOTH TO THE STATE AND TO THE INDUSTRY.

AS I MENTIONED AT THE BEGINNING OF MY TESTIMONY, WE RECOGNIZE THAT YOU MUST COME TO GRIPS WITH A NUMBER OF DIFFICULT POLICY ISSUES WHICH HAVE BOTH SHORT AND LONG TERM IMPLICATIONS. ARCO CAN EMPATHIZE WITH THE STATE'S CURRENT ECONOMIC DILEMNA. THE DECLINE IN THE PRICE OF CRUDE OIL HAS HAD A PROFOUND AND PROBABLY PERMANENT

IMPACT ON THE OIL INDUSTRY. LAST SUMMER, WHEN OIL PRICES FELL TO A LOW OF AROUND $10/BBL IN THE LOWER 48 STATES, THE INDUSTRY IN ALASKA WAS STRUGGLING WITH THE PROSPECT OF NEGATIVE WELLHEAD VALUES AND OF FALLING BELOW OUR PROFIT AND CASH FLOW BREAKEVEN POINTS. AS A RESULT, THE INDUSTRY MADE A NUMBER OF DIFFICULT CHOICES WHICH RESULTED IN ORGANIZATIONAL RESTRUCTURINGS AND SUBSTANTIAL REDUCTIONS IN OPERATING COSTS AND CAPITAL EXPENDITURES. ALTHOUGH THE STATE'S REVENUES WERE SEVERELY REDUCED, IT IS IMPORTANT TO REMEMBER THAT THE STATE RECEIVES ITS SHARE OF OIL AND GAS REVENUES FROM "OFF THE TOP". INASMUCH AS PRODUCTION TAXES ARE ASSESSED AGAINST THE GROSS VALUE OF THE OIL BEFORE CONSIDERATION OF THE ATTENDANT COSTS OF PRODUCTION, THE INDUSTRY DOES NOT NECESSARILY HAVE TO EARN A PROFIT FOR THE STATE TO ENJOY CONTINUED BENEFITS FROM OIL AND GAS PRODUCTION.

AS HARD AS THE STATE WAS HIT, THE INDUSTRY WAS HIT HARDER. IN FACT, AS THE PRICE OF CRUDE DECLINED, THE STATE'S RELATIVE SHARE OF NET REVENUE INCREASED. IN 1986, THE STATE'S SHARE OF TOTAL OIL AND GAS NET REVENUES AVERAGED 58%. DURING THE LOW POINT OF THE OIL

PRICE DECLINE IN 1986, THE STATE RECEIVED OVER 100% OF THE REVENUES NET OF OPERATING EXPENSES.

EVEN AFTER THE INDUSTRY'S RE-STRUCTURING AND AFTER SOME CRUDE PRICE RECOVERY, WE STILL FIND OURSELVES IN AN EXTREMELY TIGHT ECONOMIC POSITION TODAY. THERE IS NO SLACK. ANY INCREASE IN TAXES HAS THE EFFECT OF LIMITING THE AMOUNT OF CAPITAL AVAILABLE FOR OIL AND GAS EXPLORATION AND PRODUCTION IN ALASKA.

THE LEGISLATIVE PROPOSALS BEFORE YOU TODAY WILL SIGNIFICANTLY INCREASE THE AMOUNT OF TAXES WHICH THE INDUSTRY WOULD OTHERWISE BE REQUIRED TO PAY. ALTHOUGH THE RECENTLY PROPOSED SUBSTITUTE BILL IS SUBSTANTIALLY MORE ONEROUS THAN THE BILL INTRODUCED ON BEHALF OF THE ADMINISTRATION, BOTH MAY LEAD TO SIGNIFICANT CHANGES IN THE SCOPE AND TIMING OF ONGOING AND FUTURE PROJECTS AND MAY CAUSE SUBSTANTIAL AMOUNTS OF RECOVERABLE OIL TO BE LEFT IN THE GROUND. AS I WILL EXPLAIN IN A FEW MINUTES, THIS REDUCTION IN OIL AND GAS ACTIVITY WILL ALSO HAVE A DETRIMENTAL IMPACT ON THE STATE'S OVERALL ECONOMIC RECOVERY.

WITH REGARD TO HOW INVESTMENT DECISIONS ARE MADE AND WHY THE TAX PROPOSALS BEFORE YOU ARE VIEWED WITH CONCERN, IT IS IMPORTANT

TO RECOGNIZE THAT TAXES ARE SIGNIFICANT FACTORS WHICH ARE CONSIDERED IN ASSESSING THE ECONOMIC VIABILITY OF PROPOSED PROJECTS. OF INCREASING IMPORTANCE IS THE IMPACT THAT STATE TAXES CAN HAVE ON PROJECT ECONOMIC EVALUATIONS, ESPECIALLY AT A TIME WHEN PROPOSED ALASKA PROJECTS ARE COMPETING FOR LIMITED CAPITAL RESOURCES WITH INVESTMENT OPPORTUNITIES THAT EXIST ELSEWHERE IN THE WORLD. IN RECOGNITION OF THE ROLE THAT STATE TAXES PLAY IN INVESTMENT DECISION MAKING, SOME OIL STATES, INCLUDING WYOMING AND LOUISANA, HAVE RECENTLY REDUCED STATE TAX BURDENS TO STIMULATE THE OIL INDUSTRY IN THEIR RESPECTIVE STATES. OTHER OIL PRODUCING STATES ARE CONSIDERING THE ENACTMENT OF TAX INCENTIVES AS WELL (E.G. KANSAS AND OKLAHOMA). IT IS ALSO INTERESTING TO NOTE THAT SECRETARY OF ENERGY HERRINGTON HAS PROPOSED FEDERAL TAX INCENTIVES TO ENCOURAGE OIL AND GAS INVESTMENTS IN THE UNITED STATES.

ANOTHER FACTOR WHICH INFLUENCES INVESTMENT DECISIONS TODAY IS THE REALIZATION THAT OIL, AS AN INTERNATIONALLY TRADED COMMODITY, IS HIGHLY SENSITIVE TO THE VAGARIES OF FLUCTUATIONS IN WORLD SUPPLY AND DEMAND. ACCORDINGLY, PRODUCERS MUST PLACE PRIMARY IMPORTANCE ON PRODUCING OIL AT A LOW COST PER BARREL IN ORDER TO COMPETE IN A

LOW CRUDE PRICE ENVIRONMENT WHERE LOW COST OPEC AND OTHER PRODUCERS POSSESS ENORMOUS MARKET ADVANTAGES.

REALITIES SUCH AS THE IMPORTANCE OF TAXES IN PROJECT EVALUATION AND THE ABSOLUTE NECESSITY OF BEING A LOW COST PRODUCER IMPACT MANY OF OUR INVESTMENT OPPORTUNITIES IN ALASKA, PARTICULARILY IF OUR SEVERANCE TAX BURDEN INCREASES. THIS IS ESPECIALLY TRUE WITH RESPECT TO THOSE "MARGINAL" PROJECTS WHICH HAVE A LOW PRESENT WORTH. SUCH PROJECTS EXIST NOT ONLY AT SMALL MARGINAL FIELDS BUT ALSO AT LARGER MATURING FIELDS. AT A MATURING FIELD, LIKE PRUDHOE BAY, WE MUST RELY INCREASINGLY ON HIGHER COST SECONDARY AND TERTIARY RECOVERY TECHNIQUES AND ON EXTENSIVE INFILL DRILLING PROGRAMS. MOREOVER, WELLS LOCATED AT THE PERIPHERY OF THE FIELD WHERE THE RESERVOIR IS SHALLOWER ARE ECONOMICALLY MARGINAL AND BECOME UNECONOMIC IF THE ATTENDANT RISKS AND COSTS, SUCH AS TAXES, INCREASE. AMONG THE THREATENED MARGINAL PROJECTS AT PRUDHOE BAY ARE THE WEST END DEVELOPMENT PROJECT, HURL STATE, AND VARIOUS WATERFLOOD AND INFILL DRILLING PROGRAMS.

WE ESTIMATE (AT CRUDE PRICES HIGHER THAN THOSE PREVAILING TODAY) THAT IF THE SEVERANCE TAX RATE AT PRUDHOE BAY REMAINED AT

15%, THE INFILL DRILLING PROGRAM COULD BE REDUCED BY AS MUCH AS 30%. SUCH A CHANGE COULD SHORTEN THE PRODUCING LIFE OF THE FIELD BY AS MUCH AS THREE YEARS, LEAVING SIGNIFICANT AMOUNTS OF OTHERWISE RECOVERABLE OIL IN THE GROUND.

BECAUSE THESE PROPOSALS MAY ADVERSELY IMPACT OUR ABILITY TO UNDERTAKE MARGINAL PROJECTS, WE VIEW THESE PROPOSALS AS ADVERSE BOTH TO THE STATE AND TO THE INDUSTRY. THE PROPOSALS FRUSTRATE OUR MUTUAL GOALS OF MAXIMIZING THE VALUE OF THE RESOURCES IN PLACE.

AS I HAVE DISCUSSED, BOTH THE INDUSTRY AND THE STATE WILL BE DIRECTLY AND ADVERSELY AFFECTED BY THE POSTPONEMENT OF OIL DRILLING AND OTHER DEVELOPMENT PROJECTS AND BY THE REDUCED ULTIMATE RECOVERY OF WHAT COULD BE SUBSTANTIAL AMOUNTS OF OIL. ADDITIONALLY, THE ADVERSE IMPACT OF THESE LEGISLATIVE PROPOSALS BECOMES EVEN GREATER WHEN THEIR OVERALL IMPACT ON THE ALASKAN ECONOMY IS CONSIDERED. STUDIES OF THE ALASKA ECONOMY AND THE WAY IN WHICH ECONOMIC GROWTH CAN BE STIMULATED REVEAL - NOT SURPRISINGLY - THAT THE OIL AND GAS INDUSTRY AND ITS RELATED SUPPORT INFRASTRUCTURE CONSTITUTE THE PRINCIPAL "ENGINE" WHICH DRIVES THE STATE'S ECONOMY. OF COURSE, ALASKA'S GROSS STATE PRODUCT IS ALSO BENEFITTED BY FISHING,

TOURISM, TIMBER, NET FEDERAL GOVERNMENT EXPENDITURES, MINERALS, AND COAL. HOWEVER, THESE STUDIES REVEAL THAT THE WEALTH GENERATED THROUGH OIL AND GAS FAR EXCEEDS THAT OF ANY OTHER SEGMENT OF THE ALASKA ECONOMY. AN ECONOMIC MODEL DEVELOPED BY THE STATE CHAMBER OF COMMERCE'S COMMISSION ON STRATEGIC PLANNING REVEALS THAT IN 1986 OVER 60% OF THE TOTAL NET WORTH GENERATED BY THE STATE'S ECONOMY WAS DERIVED FROM THE OIL INDUSTRY. IT SHOULD BE NOTED THAT THE IMPACT OF OIL AND GAS ON THE STATE'S ECONOMY WAS SIGNIFICANTLY GREATER PRIOR TO LAST YEAR'S DECLINE IN CRUDE PRICES. THUS, CHANGES IN OUR LAWS WHICH REDUCE PRIVATE SECTOR SPENDING, PARTICULARLY IN THE OIL INDUSTRY (WITH ITS HIGHER THAN AVERAGE ECONOMIC MULTIPLER EFFECT) DETER ECONOMIC GROWTH IN THE STATE.

THIS OBSERVATION IS PARTICULARLY IMPORTANT GIVEN THE CURRENT STATE OF THE ALASKA ECONOMY. THE OIL INDUSTRY AND OTHER SEGMENTS OF THE ECONOMY AFFECTED BY DECLINING OIL PRICES HAVE ALREADY MADE MANY OF THE NECESSARY ADJUSTMENTS. THESE ADJUSTMENTS HAVE BEEN DIFFICULT AND THERE HAVE BEEN SIGNIFICANT DECLINES EXPERIENCED THROUGHOUT THE ECONOMY. AT THE PRESENT TIME, HOWEVER, A CERTAIN

DEGREE OF STABILIZATION IS OCCURRING. SOME RAYS OF LIGHT ARE BEGINNING TO EMERGE AT THE END OF THE TUNNEL. IT IS OUR BELIEF THAT THE STATE'S ECONOMIC DECLINE CAN BE STABILIZED AND THAT ECONOMIC GROWTH IN ALASKA CAN BE REKINDLED IN THE NOT TOO DISTANT FUTURE. TAX INCREASES, HOWEVER, THAT REMOVE SUBSTANTIAL MONETARY RESOURCES FROM THE INDUSTRY (OR FROM ANY OTHER SEGMENT OF THE PRIVATE SECTOR) AT THIS VERY CRITICAL TIME MAY PRECIPITATE FURTHER ECONOMIC DECLINE OR MAY RETARD ECONOMIC RECOVERY.

IN CONCLUSION OF MY TESTIMONY, WE OPPOSE THE PROPOSED MODIFICATIONS TO THE ECONOMIC LIMIT FACTOR ON THE GROUNDS THAT: (1) THESE CHANGES ARE CONTRARY TO THE RESOURCE AND TAX POLICY OBJECTIVES OF THE STATE; (2) THE ADVERSE IMPACT ON THE INDUSTRY WILL IMPAIR THE ECONOMIC VIABILITY OF MARGINAL PROJECTS, THEREBY REDUCING THE AMOUNT OF OIL AND RELATED REVENUES WHICH ULTIMATELY CAN BE RECOVERED BY THE INDUSTRY AND THE STATE; AND (3) INCREASES IN TAXES WHICH RESULT IN CORRESPONDING DECREASES IN PRIVATE SECTOR SPENDING ARE ADVERSE TO THE ECONOMIC RECOVERY OF THE STATE.

THANK YOU AGAIN FOR THE OPPORTUNITY TO SHARE THESE VIEWS WITH YOU TODAY.

THE ALLIANCE

P.O. Box 100100 / Anchorage, Alaska 99510 / (907) 278-4444

TESTIMONY

OF

THE

ALASKA SUPPORT INDUSTRY

A L L I A N C E

Presented by

Chuck Becker

to the

JOINT HOUSE RESOURCES AND FINANCE COMMITTEES

at a

HEARING ON HOUSE BILL 164 (CS)

March 19, 1987

Good morning Chairman Adams, Chairman Cotten, Chairman Herrman, Chairman Pourchot - distinguished members of the House Resources and Finance Committees.

I am Chuck Becker, representing the Alaska Support Industry Alliance of which I am vice president. I am the director of government affairs for the Alaska Division of Brown & Root USA, an international engineering and construction company and a sustaining member of the Alliance.

For those of you who may be unfamiliar with the Alliance, it has become the collective voice of just over 300 firms throughout Alaska which perceive their interests to be best served by a vigorous and profitable petroleum industry in the state. Members of the Alliance are associated with both large companies and small businesses engaged in drilling and cementing, logging and transporting, banking and accounting, constructing and engineering, brokering and designing. Alliance members typically are active in Alaska's political dynamic and concerned over public policy decisions and initiatives. Annually, a survey of the membership is conducted to assess concerns, followed by a series of forums which order a very limited number of priorities of paramount concern to our members.

Ladies and gentlemen, you have before you today <u>the</u> number one priority of the Alliance on which the State government can decisively act - simply stated,"to maintain a stable tax rate and structure on the petroleum industry".

Although the substitute bill has not yet been throroughly reviewed, the concepts contained in it had been anticipated and discussed, meeting with the same chagrin as that generated by the original bill. On behalf of the Alliance members, I am compelled to emphasize that the committee substitute for house bill 164 represents the antithesis of progressive public policy.

The Alaska economy is not suffering from too little government. It is suffering from an insufficient private sector base. Higher taxes on the petroleum industry would only serve to exacerbate that

structural economic problem.

Increasing taxes on the petroleum industry at a time when the price of oil has slumped by over 50% would send precisely the wrong signal to that industry which sustains, in one way or another, Alaska's private sector and its publicly driven economy. With production from the Prudhoe Bay field set to begin its inexorable decline within the next 18 months, the state must improve incentives to explore for new fields and to enhance recovery from existing ones. The proposed modification of the ELF formula which places emphasis on production of fields rather than wells is, in fact, a disincentive confronting the decisionmaker responsible for issuing go/no go orders on development wells. Under the current formula, an additional well in a mature field can drop the production tax burden and can sustain production at the maximum efficient rate for a more prolonged period benefiting both the producer and the state treasury. Approving this proposal risks redirecting future investments by reducing the value of large fields, leaving potential oil fields undiscovered, lowering potential state revenues and further sapping an already anemic private sector.

Alaska must go through withdrawal from its debilitating addiction to state government spending and choose instead the renewal which can come from development of the private sector. You,as leaders of government, are presented with an opportunity to mitigate state spending this year beginning that beneficial redirection. The Alliance urges you to set into place a plan of transition spanning a period of four to six years to gradually bring state expenditures into line with current-year income. Such a plan will allow sufficient time in which to carefully consider specific cuts and will minimize associated economic and social dislocations. Above all, we urge you to stand tall and rebuff any initiative to increase taxes on individuals and businesses in Alaska. Thank you for your consideration.

TESTIMONY OF MARK L. HAZELWOOD
BEFORE THE HOUSE FINANCE COMMITTEE CONCERNING
PROPOSED CHANGES IN THE ECONOMIC LIMIT FACTOR OF
THE ALASKA OIL & GAS PROPERTIES PRODUCTION TAX (H.B. 545)
FEBRUARY 14, 1986

HB 545

INTRODUCTION

GOOD AFTERNOON. MY NAME IS MARK L. HAZELWOOD AND I AM THE VICE PRESIDENT OF FINANCE, PLANNING & CONTROL FOR ARCO ALASKA, INC. I APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY IN ORDER TO EXPRESS ARCO ALASKA'S VIEWS CONCERNING H.B. 545 WHICH IS DESIGNED TO MODIFY THE ECONOMIC LIMIT FACTOR (ELF) OF THE ALASKA OIL & GAS PROPERTIES PRODUCTION TAX (AS 43.55).

IN MY TESTIMONY TODAY CONCERNING H.B. 545, I WOULD LIKE FIRST TO EXAMINE SOME OF THE TAX POLICY CONSIDERATIONS UNDERLYING THE STATE'S CURRENT PRODUCTION TAX APPROACH. WITH THESE CONSIDERATIONS IN MIND, AND WITH A CONCEPTUAL UNDERSTANDING OF HOW THE ELF UNDER CURRENT LAW OPERATES, IT WILL BE EASIER TO IDENTIFY THE REASONS WHY ARCO AND OTHER INDUSTRY MEMBERS OPPOSE ENACTMENT OF H.B. 545.

GENERAL TAX POLICY CONSIDERATIONS

FROM A TAX POLICY POINT OF VIEW, TAXES ON GROSS VALUE (SUCH AS THE ALASKA PRODUCTION TAX) ARE REGRESSIVE IN NATURE TO THE EXTENT THAT THE DETERMINATION OF ONE'S TAX BURDEN DOES NOT TAKE INTO ACCOUNT THE ECONOMIC CIRCUMSTANCES OF THE TAX PAYER (SUCH AS COSTS AND OTHER FACTORS AFFECTING PROFITABILITY). POLICY MAKERS MUST, THEREFORE, CONTINUALLY BE SENSITIVE TO THE FACT THAT, IF UNCHECKED, TAXES ON GROSS VALUE CAN BECOME QUITE ONEROUS TO THE TAXPAYER AND CONSTITUTE A DISINCENTIVE TO CONTINUED INVESTMENT AND OPERATIONS.

IN THE CASE OF THE ALASKA PRODUCTION TAX, SUCH DISINCENTIVES WOULD NOT ONLY BE ADVERSE TO THE PRODUCER AND HAVE THE EFFECT OF LEAVING OIL AND GAS RESERVES IN THE GROUND, IT ALSO WOULD BE COUNTERPRODUCTIVE TO THE STATE'S OBJECTIVES OF CONTINUED ECONOMIC GROWTH AND PROSPERITY. THESE VIEWS ARE UNIFORMALLY SUPPORTED BY ECONOMISTS AND OTHER TAX POLICY EXPERTS INCLUDING MR. MILTON LIPTON, AN ECONOMIC CONSULTANT TO THE STATE OF ALASKA.

STATE OF ALASKA APPROACH

THE STATE OF ALASKA HAS AN ESTABLISHED HISTORY OF TAKING THESE TAX POLICY CONSIDERATIONS INTO ACCOUNT WITH REGARD TO ITS PRODUCTION TAX. PRIOR TO 1977, THE STATE EMPLOYED A SLIDING SCALE TAX MECHANISM TO REDUCE THE PRODUCER'S TAX BURDEN AS THE RATE OF PRODUCTION PER WELL DECLINED. UNDER THIS APPROACH, THE REGRESSIVE NATURE OF THE PRODUCTION TAX WAS REDUCED BY APPLYING A PROGRESSIVELY LOWER EFFECTIVE TAX RATE AS THE PRODUCTION RATE PER WELL FELL BELOW CERTAIN LEVELS. FOR EXAMPLE, THE EFFECTIVE TAX RATE FOR WELLS PRODUCING OVER 1000 BARRELS A DAY WAS 8% WHEREAS WELLS PRODUCING FROM 300 BARRELS UP TO 1000 BARRELS A DAY WAS TAXED AT A 6% RATE.

IN 1977, THE STATE'S SLIDING SCALE PRODUCTION TAX WAS REPLACED WITH THE CURRENT ECONOMIC LIMIT FACTOR APPROACH. THIS CHANGE, WHICH COINCIDED WITH THE START UP OF PRUDHOE BAY PRODUCTION, WAS MADE IN RESPONSE TO CRITICISM THAT THE SLIDING SCALE TAX CONCEPT WAS NOT SUFFICIENTLY RESPONSIVE TO DIFFERENCES IN THE ECONOMICS OF OIL PRODUCTION OPERATIONS CONDUCTED IN THE COOK INLET AND ON THE NORTH SLOPE OF ALASKA. THE LEVEL OF CAPITAL EXPENDITURES AND OPERATING COSTS FOR THE TWO DIFFERENT OPERATING ENVIRONMENTS, ALONG WITH THE REALIZATION THAT NORTH SLOPE CRUDE WOULD HAVE A SUBSTANTIALLY LOWER WELLHEAD VALUE THAN COOK INLET CRUDE, CONTRIBUTED TO THE STATE'S DECISION TO CHANGE.

THE STATE'S CURRENT ELF APPROACH

THE CURRENT ELF APPROACH IS CONSIDERABLY MORE SOPHISTICATED THAN THE SLIDING SCALE APPROACH USED PRIOR TO 1977. DESPITE THEIR DIFFERENCES, HOWEVER, BOTH TAX CONCEPTS WERE DESIGNED TO REDUCE THE REGRESSIVE NATURE OF THE PRODUCTION TAX BY TAKING INTO ACCOUNT THE ECONOMIC REALITIES OF OIL FIELD OPERATIONS. BOTH APPROACHES WERE BASED ON THE PREMISE THAT AS PRODUCTION RATE PER WELL DECLINES, THE PRODUCER'S TAX BURDEN SHOULD FALL SO AS NOT TO DISCOURAGE CONTINUED INVESTMENT AND OPERATIONS. UNDERLYING THIS PREMISE IS THE FACT THAT AS THE PRODUCTION RATE PER WELL FALLS, THE PRODUCER'S COSTS OF MAINTAINING PRODUCTION AND OF MAXIMIZING THE RECOVERY OF OIL AND GAS RESERVES FROM THE FIELD ARE INCREASING. THIS IS PARTICULARLY TRUE AS FIELDS MATURE AND PRODUCERS INCREASINGLY RELY ON HIGHER COST SECONDARY AND TERTIARY RECOVERY TECHNIQUES AND ON EXTENSIVE INFIELD DRILLING PROGRAMS. UNLIKE THE PRIOR LAW, THE CURRENT ELF ALSO PROVIDES A MECHANISM WHEREBY THE PRODUCER MAY PETITION THE DEPARTMENT OF REVENUE FOR A LOWER EFFECTIVE TAX RATE TO INSURE RECOVERY OF CERTAIN CASH COSTS.

NOTWITHSTANDING THE SEEMINGLY COMPLEX FORMULA SET FORTH IN THE ALASKA STATUTES, THE ELF FACTOR IS DETERMINED PRIMARILY BASED ON THE RELATIONSHIP BETWEEN (1) A PRESUMED LEVEL OF PRODUCTION REQUIRED TO RECOVER CERTAIN CASH COSTS SUCH AS WAGES AND SUPPLIES (300 BBLS A DAY SUBJECT TO REBUTTAL BY THE PRODUCER) AND (2) THE AVERAGE RATE OF PRODUCTION PER WELL. THE EXPONENT IN THE CURRENT LAW SERVES AS AN ADJUSTMENT MECHANISM WHICH GENERALLY REDUCES THE FACTOR BY A SLIGHT AMOUNT CONSISTENT WITH THE OVERALL INTENT OF REDUCING THE REGRESSIVE NATURE OF THE PRODJCTION TAX. ONCE THE ELF FACTOR IS DETERMINED, IT IS MULTIPLIED TIMES THE STATUTORY RATE TO DERIVE THE TAXPAYER'S EFFECTIVE TAX RATE. IT SHOULD BE NOTED THAT UNDER CURRENT LAW, AN ELF FACTOR OF 1.0 IS USED IN DERIVING THE TAXPAYER'S EFFECTIVE TAX RATE IF, IN THE FIRST TEN YEARS OF A FIELD'S PRODUCTIVE LIFE, THE CALCULATED ELF IS GREATER THAN .7. EXAMPLE CALCULATIONS ARE CONTAINED IN WRITTEN COMMENTS WHICH WILL BE FILED WITH THE FINANCE COMMITTEE.

WITHOUT GOING INTO FURTHER DETAIL AS TO HOW THE FACTOR IS MECHANICALLY DERIVED, THE ELF CONCEPT ADOPTED BY THE STATE IN 1977 ESSENTIALLY CHANGED THE ALASKA PRODUCTION TAX FROM A SLIDING SCALE TAX TO A MORE SOPHISTICATED VARIABLE RATE TAX. OUR VIEW OF THE ELF UNDER CURRENT LAW IS THAT IT REDUCES THE REGRESSIVE NATURE OF THE STATE'S PRODUCTION TAX BY TAKING INTO ACCOUNT CERTAIN COSTS OF OPERATIONS AND THE ECONOMIC REALITIES OF DECLINING RATES OF PRODUCTION PER WELL. THE FACT THAT THE INDUSTRY RELIED UPON THE STATE'S CURRENT ELF TAX LAW AND THAT THE LAW HAS REMAINED STABLE FOR THE PAST SEVERAL YEARS IS EXTREMELY IMPORTANT FROM OUR PERSPECTIVE IN EVALUATING THE INVESTMENT CLIMATE OF THE STATE.

H.B. 545

HOUSE BILL 545 IS DESIGNED TO SUBSTANTIALLY INCREASE THE PRODUCTION TAX BURDEN OF PRODUCERS IN LARGE FIELDS BY MAKING A FUNDAMENTAL CHANGE IN THE ECONOMIC LIMIT FACTOR FORMULA. UNDER THE PROPOSAL, THE EXPONENT FEATURE OF THE EXISTING ELF FORMULA WOULD BE MODIFIED SUCH THAT THE FACTOR WOULD BE BASED BOTH ON AVERAGE PRODUCTION RATE PER WELL (CONSISTENT WITH THE EXISTING LAW) AND ON THE TOTAL RATE OF PRODUCTION FOR THE FIELD (A NEW APPROACH WHICH SUBSTANTIALLY CHANGES THE UNDERLYING CONCEPT AND OPERATION OF THE STATE'S PRODUCTION TAX LAW). AS A RESULT, THE PROPOSED CHANGE WOULD IMPOSE A HEAVIER TAX BURDEN ON LARGER FIELDS THAN THAT IMPOSED ON SMALLER FIELDS EVEN IF THE PROFITABILITY AND THE AVERAGE RATE OF PRODUCTION FOR WELLS IN THE RESPECTIVE FIELDS WERE EXACTLY THE SAME.

IN COMPARING THE EXISTING LAW WITH THE PROPOSED CHANGES CONTAINED IN H.B. 545, A FIELD WHICH PRODUCES MORE THAN 80,000 BARRELS A DAY WOULD BE SUBJECT TO A PROGRESSIVELY HIGHER TAX RATE THAN UNDER CURRENT LAW. ON THE OTHER HAND, A FIELD WHICH PRODUCES LESS THAN 80,000 BARRELS A DAY WOULD BE SUBJECT TO A DECREASINGLY SMALLER RATE OF TAX THAN UNDER CURRENT LAW.

A COMPARISON OF ECONOMIC LIMIT FACTORS UNDER THE EXISTING AND PROPOSED LAWS (PRIOR TO APPLICATION OF THE SPECIAL TEN YEAR RULE UNDER AS 43.55.013(B)(2)) REVEALS A SIGNIFICANT INCREASE IN THE TAX LIABILITY OF PRODUCERS IN LARGE FIELDS. FOR EXAMPLE, WELLS WHICH PRODUCE AT A RATE OF 1500 BARRELS PER DAY WOULD HAVE AN ELF UNDER CURRENT LAW OF APPROXIMATELY .71. UNDER THE PROPOSED LAW, A WELL PRODUCING AT 1500 BARRELS A DAY IN A FIELD WHICH PRODUCES 75,000 BARRELS PER DAY WOULD HAVE AN ELF OF .69 (SLIGHTLY BELOW THE CURRENT LAW ELF). A WELL PRODUCING AT THE SAME RATE IN A FIELD THAT PRODUCES 1.5 MILLION BARRELS A DAY, HOWEVER, WOULD HAVE AN ELF OF .98 OR AN INCREASE IN THE ELF FACTOR OF .29. A CHART ILLUSTRATING THESE RESULTS IS INCLUDED IN OUR WRITTEN COMMENTS. CHANGES OF THIS NATURE UNDER THE PROPOSED LAW WOULD SIGNIFICANTLY AND UNJUSTIFIABLY INCREASE THE TAX BURDENS ON LARGE FIELD PRODUCERS AND WOULD SIGNIFICANTLY UNDERMINE THE TAX POLICY OBJECTIVES HISTORICALLY FOLLOWED BY THE STATE.

EFFECT ON LARGE FIELD PRODUCERS

ARCO OPPOSES THE PROPOSED CHANGES TO THE ECONOMIC LIMIT FACTOR FOR SEVERAL REASONS.

FIRSTLY, THE ENACTMENT OF H.B. 545 WOULD RESULT IN A SIGNIFICANT INCREASE IN THE ALASKA PRODUCTION TAX BURDEN OF ARCO AND OTHER LARGE FIELD PRODUCERS. MOREOVER, THE PROPOSAL, IF ENACTED, WOULD CONSTITUTE A FUNDAMENTAL CHANGE IN THE STATE'S TAX POLICY. THE STATE HAS HISTORICALLY BEEN SENSITIVE TO THE REGRESSIVE NATURE OF TAXES IMPOSED ON GROSS VALUE. THE PROPOSED ELF, HOWEVER, WOULD RESULT IN THE IMPOSITION OF A HIGHER BURDEN OF TAXATION SOLELY BECAUSE OF FIELD SIZE RATHER THAN ECONOMIC VIABILITY. ADDITIONALLY, THE PROPOSED CHANGE IN THE ELF RAISES CONCERNS ABOUT THE STABILITY OF THE STATE'S TAX CLIMATE. WE WOULD URGE THAT SERIOUS CONSIDERATION BE GIVEN TO CONTINUING THE STABLE TAX CLIMATE WHICH HAS EXISTED IN ALASKA FOR THE PAST FIVE YEARS. THIS CLIMATE HAS RESULTED IN ARCO'S HAVING INVESTED APPROXIMATELY $4.2 BILLION IN CAPITAL EXPENDITURES SINCE 1981. INASMUCH AS TAXATION IS ONE OF THE LARGEST ISSUES AFFECTING THE PROFITABILITY OF ALASKAN PRODUCTION, THE MAINTENANCE OF A FAVORABLE TAX CLIMATE IS IMPORTANT TO CONTINUED DEVELOPMENT. LEGISLATION THAT INCREASES TAXES ON THE OIL INDUSTRY WILL JEOPARDIZE SOME OF OUR DEVELOPMENT PLANS.

IT SHOULD BE NOTED IN THIS CONTEXT THAT THE STATE'S SHARE OF NET PRODUCTION REVENUES HAS REMAINED IN EXCESS OF 33% SINCE 1981. IN FACT, THE STATE'S SHARE OF NET PRODUCTION REVENUES INCREASES DRAMATICALLY AS THE PRICE OF CRUDE OIL DECLINES.

ARCO ALSO OPPOSES H.B. 545 BECAUSE THE PROPOSED CHANGES IN THE ECONOMIC LIMIT FACTOR RESULT IN DISINCENTIVES TO MAKE CAPITAL INVESTMENTS TO MAINTAIN AND/OR INCREASE THE LEVEL OF PRODUCTION IN LARGE FIELDS. THE INCREASED TAX BURDEN ON PRODUCTION FROM LARGE FIELDS IN AND OF ITSELF LESSENS THE ECONOMIC VIABILITY OF PROJECTS. MOREOVER, IN EVALUATING PROJECTS DESIGNED TO PRODUCE INCREMENTAL BARRELS, THE PROPOSED LAW WOULD IMPOSE A HIGHER EFFECTIVE TAX RATE NOT ONLY ON THE INCREMENTAL BARRELS PRODUCED BUT ALSO, AS A RESULT OF INCREASING OR MAINTAINING THE LEVEL OF FIELD PRODUCTION, A HIGHER EFFECTIVE TAX RATE ON ALL OF THE BARRELS PRODUCED IN THE FIELD.

UNDER THE EXISTING LAW, AS A PRODUCER DRILLS MORE AND MORE WELLS TO MAINTAIN FIELD RATE, THE EFFECTIVE PRODUCTION TAX RATE ON ALL OF THE BARRELS PRODUCED IS REDUCED AS THE AVERAGE WELL PRODUCTION RATE FALLS. IN SUCH A SITUATION, THE EFFECTIVE SEVERANCE TAX RATE IS REDUCED AS THE PRODUCER'S COSTS INCREASE, THEREBY REDUCING THE REGRESSIVE NATURE OF THE TAX. UNDER THE PROPOSED ELF, HOWEVER, THE DRILLING OF ADDITIONAL WELLS TO MAXIMIZE FIELD PRODUCTION IN A LARGE FIELD WOULD RESULT IN A HIGHER EFFECTIVE TAX RATE ON ALL OF THE BARRELS PRODUCED IN THE FIELD EVEN THOUGH THE PRODUCER'S COSTS INCREASE AND THE AVERAGE WELL PRODUCTION RATE DECLINES. ADDITIONALLY, THE PROPOSED TAX COULD OPERATE TO LIMIT THE ECONOMIC FIELD PRODUCTION CAPACITY OF NEW OR EXISTING FIELDS TO SOMETHING LESS THAN THAT WHICH WOULD HAVE RESULTED UNDER THE CURRENT LAW. THE PROPOSED LAW, THEREFORE, COULD RESULT IN REDUCING CAPITAL INVESTMENTS IN THE STATE, LEAVING RESERVES IN THE GROUND OR SUBSTANTIALLY DELAYING THEIR PRODUCTION, AND REDUCING THE STATE'S REVENUE AS PRODUCTION RATES DECLINE.

FINALLY, ARCO OPPOSES H.B. 545 BECAUSE ITS ENACTMENT COULD SIGNIFICANTLY AGGRAVATE THE WORSENING ECONOMIC OUTLOOK FOR THE OIL INDUSTRY IN ALASKA. CONTINUING UNCERTAINTIES CONCERNING CRUDE PRICES HAVE REQUIRED THAT THE ECONOMIC VIABILITY OF OIL AND GAS RELATED INVESTMENTS BE CAREFULLY RE-EVALUATED. THE PROSPECT OF A TAX INCREASE SENDS A VERY DISTURBING MESSAGE TO THE INDUSTRY CONCERNING THE POTENTIAL LACK OF TAX STABILITY AT A TIME WHEN THE INDUSTRY IS FACING OTHER VERY LEVERAGING UNCERTAINTIES.

THE SERIOUSNESS OF THE CURRENT ECONOMIC SITUATION IS CLEARLY DEMONSTRATED BY RECENT EVENTS.

- SINCE NOVEMBER OF 1985 CRUDE OIL PRICES ON THE NEW YORK MERCANTILE EXCHANGE AND SPOT MARKET HAVE FALLEN FROM $31.00 TO LESS THAN $16.00 A BARREL, AS OF YESTERDAY.

- LOWER 48 CRUDE POSTED PRICES ON THE TERM CONTRACT MARKET HAVE FALLEN BY APPROXIMATELY $6.00 TO $8.00 PER BARREL SINCE THE MIDDLE OF JANUARY SUCH THAT WEST TEXAS INTERMEDIATE CRUDE IN THE GULF COAST IS SELLING FROM $20.00 TO $23.00 PER BARREL TODAY.

- ALASKA NORTH SLOPE CRUDE ON THE U.S. GULF COAST WAS SELLING AT ABOUT $15.60 PER BARREL ON THE SPOT MARKET EARLIER THIS WEEK.

- THE OIL INDUSTRY CONTINUES TO EXPERIENCE A RETRENCHMENT IN DRILLING. ACCORDING TO THE PETROLEUM INFORMATION CORPORATION OF DENVER THE NUMBER OF OIL AND GAS WELLS THAT WERE COMPLETED IN 1985 SHOWED A 20% DECLINE FROM THE PRECEDING YEAR. LIKEWISE THE NUMBER OF ACTIVE DRILLING RIGS HAS BEEN ~~FALLING~~ declining DAILY. CURRENTLY THE RIG COUNT IS DROPPING BY 100 A WEEK ACCORDING TO DATA RESOURCES.

- STANDARD & POOR'S RECENTLY INDICATED THAT IT MIGHT LOWER THE CREDIT RATINGS OF 13 OIL COMPANIES THAT IT BELIEVES ARE PARTICULARLY VULNERABLE TO FALLING OIL PRICES.

ALL OF THESE RECENT EVENTS UNDERSCORE THE IMPORTANCE OF MAINTAINING A FAVORABLE TAX AND INVESTMENT CLIMATE IN ALASKA.

IN ADDITION TO CREATING CONCERNS ABOUT THE INVESTMENT ENVIRONMENT IN ALASKA, THE ENACTMENT OF H.B. 545 COULD FURTHER CONSTRAIN THE AMOUNT OF CAPITAL WHICH IS AVAILABLE FOR OIL AND GAS DEVELOPMENT IN THE STATE. ADDITIONAL TAX PAYMENTS TO THE STATE MOST PROBABLY WOULD TRANSLATE INTO FEWER DOLLARS AVAILABLE FOR INVESTMENT.

DUE TO THE UNCERTAINTIES SURROUNDING CRUDE OIL PRICES, ARCO ANNOUNCED EARLIER THIS WEEK ITS DECISION TO SUBSTANTIALLY REDUCE ITS 1986 PLANNED CAPITAL EXPENDITURES BY $1 BILLION. OF THAT AMOUNT, APPROXIMATELY $200 MILLION OF REDUCTIONS WERE MADE IN ARCO ALASKA'S 1986 CAPITAL PROGRAMS.

ARCO DOES INTEND TO CONTINUE WITH OUR INVESTMENT PLANS PERTAINING TO MAJOR PLANT FACILITIES WHICH ARE SCHEDULED TO BE INSTALLED LATER THIS YEAR AT THE PRUDHOE, KUPARUK AND LISBURNE FIELDS. THE AREAS OF ENDEAVOR WHICH ARE MOST VULNERABLE TO REDUCTIONS OR DEFERRALS, THEREFORE, ARE DEVELOPMENT DRILLING PROGRAMS AND OTHER SMALLER PROJECTS.

CONCLUSION

IN SUMMARY, ARCO ALASKA OPPOSES THE ENACTMENT OF H.B. 545 FOR THE REASONS THAT THE PROPOSED MODIFICATION TO THE STATE'S ECONOMIC LIMIT FACTOR (1) WOULD CONSTITUTE A SIGNIFICANT INCREASE IN THE TAX BURDEN IMPOSED ON PRODUCERS OF LARGE FIELDS IN ALASKA, (2) WOULD CREATE A DISINCENTIVE TO INVESTMENTS DESIGNED TO INCREASE OR MAINTAIN FIELD PRODUCTION LEVELS, (3) WOULD SIGNIFICANTLY DAMAGE THE STATE'S INVESTMENT AND TAX CLIMATE BY RAISING SERIOUS CONCERNS ABOUT TAX STABILITY, (4) WOULD FURTHER DEPLETE THE INDUSTRY OF MONIES AVAILABLE FOR INVESTMENTS IN THE STATE AND (5) WOULD BE INCONSISTENT WITH THE STATE'S TAX POLICY AND ECONOMIC OBJECTIVES.

House Bill 164

Joint Hearings of the House Resources and Finance Committees

Testimony of Thomas K. Williams

March 19, 1987

Mr. Chairman and Members of the Committees:

Thank you for this opportunity to testify on House Bill No. 164, amending the Economic Limit Factor, or "ELF," in the state production tax on oil. My name is Thomas K. Williams, and I am General Counsel for Cook Inlet Region, Inc. -- "CIRI" for short -- one of the original 12 Regional Corporations established pursuant to the Alaska Native Claims Settlement Act. For more than seven years from 1975 through 1982 I had responsibility for administering Alaska's oil and gas taxes, first as Director of Petroleum Revenue and then as Commissioner of Revenue. Not only did I have to make the ELF work after its enactment in 1977, but it was my idea in the first place. Based on my past and present experience, I have three points I would like to share with you regarding this Bill.

First, this is the wrong time to raise taxes on the oil industry, which is what this Bill would do. The collapse of oil prices has hit oil companies' budgets even harder than it has hit the State's. The industry is not lying when it says these are hard times for it. CIRI has interests in three drilling rigs on the North Slope, and all three are idle. We have four joint ventures in the con-

struction and building trades field, and they are starved for work. No other economic sector in Alaska has been hit as directly and hard as the "oil patch." Difficult as it may be to believe, the goose that has been laying golden eggs the past eight years has fallen seriously ill.

Right now more than half of the recoverable oil at Prudhoe Bay has been produced. Even as I speak, the sustainable rate of oil production from that field could be starting to fall. Surely it will start falling soon. To offset or alleviate the effects of this decline, massive additional capital investments must be made in that field and others on the North Slope. A tax increase will "chill" those investments.

The second point I would like to share with you is that a five-year moratorium on the ELF for Prudhoe Bay is not a solution to anything. Right now the computed value of the ELF for Prudhoe is about 0.85, and it is rounded up to 1.0 under the present law. This gap will only widen with time. Delaying the time when the computed ELF becomes effective is simply going to make the problem harder to deal with when the moratorium expires.

The 1981 amendments to the ELF left a revenue "time bomb" set to go off on June 20, 1987. To the extent I had a role in the process leading to those amendments, I apologize for sticking you with this problem today. It was unforeseen that Prudhoe's 10th anniversary would come on the

heels of such a drastic fall in oil prices and state revenues.

I believe these unexpected developments do justify action by the Legislature to protect the State's interests and revenues at this time. But I do not believe the times justify a gutting of the ELF, which a five-year moratorium would do. Rather, I believe it would be appropriate to consider amendments to "phase in" the ELF over several years. This would significantly reduce the immediate revenue impact that would occur under the present law, while preserving the integrity of the ELF as a mechanism to avoid leaving oil in the ground because of the tax.

This brings me to my third point. The rebuttable presumption of 300 barrels a day per well should stay in the tax. It is this rebuttable presumption that allows that tax to be "tailored" for fields in different areas of the state. It takes a lot more production on the North Slope to break even than it does on the Kenai Peninsula. Without such "tailoring," the tax rate may be lower than it needs to be for some fields (a true tax break for those producers), and too high for others (causing them to be shut in prematurely).

The only argument I see in favor of repealing the presumption is that it protects tax revenues during times when oil prices are very low. However, the exponent in the ELF significantly protects the tax revenues from the effects of rebutting this presumption. For example, in 1977 Prudhoe

Bay production was expected to risk quickly to 1.2 million barrels a day from 120 wells, or an average of 10,000 barrels a day per well. We -- the Administration and the Legislature -- expected that the break-even rate of production was about 1,000 barrels a day per well. If the presumption is not rebutted, the ELF under those circumstances is 0.954 (see Exhibit A). If it is rebutted and 1,000 barrels a day per well is shown, the ELF is 0.953. In fact, even if the break-even rate is shown to be 2,000 barrels a day per well, the ELF is still 0.950.

In today's circumstances the ELF is still resistant to a rebuttal of the presumption. Now production is 1.5 million barrels a day from about 500 wells, or 3,000 barrels a day per well on average. Suppose the Prudhoe owners could demonstrate production at the economic limit of 2,900 barrels a day per well. The ELF would be 0.583 (see Exhibit B). Even if they showed that 2,999 barrels out of every 3,000 produced were needed to cover costs, the ELF would still be almost 0.3.

You should not let yourselves be stampeded by the ultimate horror -- zero tax revenues because the ELF could become zero if prices collapse far enough. First, contract prices never actually fell that low last year. Second, if they were to fall that low in the future, they would have to do so at exactly the right time, since there is only a six-week window between January 1 and February 15 when a taxpayer may rebut the presumption. Third, temporary fluctua-

tions in price levels should be disregarded if the ELF is being rebutted, since it is long-term price expectations, not short-term ones, that are relevant to the number of barrels of production needed to break even at the economic limit. Only if a field is right on the edge of its actual economic limit should one pay any attention to short-term price levels. A simple regulation (Exhibit C) would avoid the revenue risk and put this boogey-man to rest once and for all.

In summary, then, the extension of the 10-year suspension of the Prudhoe Bay ELF to 15 years is merely a quick fix that will make the revenue problem that much worse when eventually it has to be confronted. A much better way to reduce the shock of the ELF's "kicking in" would be to have a phase-in period of several years. Repealing the rebuttable presumption of 300 barrels a day per well also undercuts the purpose of the ELF, which is to reduce the tax burden at the right time for a field so that the tax does cause oil to be left in the ground. To do this, the ELF much reach zero when the field reaches its economic limit, and no North Slope field will be producing only 300 barrels a day at its economic limit. Rebuttability of the presumption is essential for the ELF to work properly. Because of the exponent in the ELF, state tax revenues will be substantially protected until a field actually reaches its economic limit, even if the presumption is rebutted for that field.

EXHIBIT A

to

Testimony of Thomas K. Williams

The Resistance of the Prudhoe Bay ELF to Change When the Presumption is Rebutted (1977 expectations)

1. The Presumption is Unrebutted. In 1977 when the ELF was enacted, Prudhoe Bay was expected to be producing approximately 1.2 million barrels a day from about 120 wells, a daily average of 10,000 barrels per well. Under the presumption of 300 barrels a day per well, the ELF equals --

$$ELF = [1 - (300 \times 120)/1{,}200{,}000]^{460/300}$$

$$= [1 - 36{,}000/1{,}200{,}000]^{460/300}$$

$$= (0.9700)^{1.53333}$$

$$= 0.954$$

2. The Presumption is Rebutted and 1,000 B/D is Shown. It was expected in 1977 that the production rate at the economic limit for Prudhoe Bay would be about 1,000 barrels a day per well. If the presumption was rebutted and this rate was shown instead, the ELF equals --

$$ELF = [1 - (1{,}000 \times 120)/1{,}200{,}000]^{460/1{,}000}$$

$$= (0.9000)^{0.4600}$$

$$= 0.953$$

3. 2,000 B/D is Shown. Even if the presumption is rebutted and 2,000 barrels a day is shown instead, the ELF equals --

$$ELF = [1 - (2{,}000 \times 120)/1{,}200{,}000]^{460/2{,}000}$$

$$= (0.8000)^{0.2300}$$

$$= 0.950$$

EXHIBIT B

to

Testimony of Thomas K. Williams

The Resistance of the Prudhoe Bay ELF to Change When the Presumption is Rebutted (today's expectations)

1. The Presumption is Unrebutted. Prudhoe Bay is now producing at its maximum allowed rate of 1.5 million barrels a day from approximately 500 wells, a daily average of 3,000 barrels per well. Under the presumption, the ELF equals --

$$ELF = [1 - (300 \times 500)/1{,}500{,}000]^{460/300}$$

$$= (0.9000)^{1.5333}$$

$$= 0.851$$

2. The Presumption is Rebutted and 2,900 B/D is Shown. Suppose the Prudhoe Bay producers could show that 2,900 out of every 3,000 barrels produced (97%) was needed to cover allowable operating costs. The ELF would equal --

$$ELF = [1 - (2{,}900 \times 500)/1{,}500{,}000]^{460/2{,}900}$$

$$= (0.0333)^{0.1586}$$

$$= 0.583$$

3. The Presumption is Rebutted and 2,999 B/D is Shown. Suppose the Prudhoe Bay producers could show that all but one barrel a day per well (99.97% of production) was needed to cover allowable operating costs. The ELF would equal --

$$ELF = [1 - (2{,}999 \times 500)/1{,}500{,}000]^{460/2{,}999}$$

$$= (0.0003)^{0.1534}$$

$$= 0.293$$

EXHIBIT C

to

Testimony of Thomas K. Williams

Suggested Regulation to Avoid Effects on the ELF That Might Arise from Temporary Price Fluctuations

15 AAC 55.010 is amended by adding a new subsection to read as follows:

(e) If a taxpayer seeks to rebut the presumed monthly production rate at the economic limit for oil production of a lease or property pursuant to AS 43-.55.013(d), the acquisition cost C.I.F. at West Coast refineries for imported oil of like quality under AS 43.55.013(f) shall be presumed to be $20 a barrel (in 1986 dollars) for oil of 27 degrees API gravity, adjusted by $0.05 (in 1986 dollars) for each degree above or below 27 degrees. The department may rebut the presumption by showing that the average acquisition cost C.I.F. at West Coast refineries for imported oil of like quality during the calendar quarter preceding the hearing was greater than the presumed cost. The taxpayer may rebut the presumption only by showing both that the average during that quarter was less than the presumed cost and that the remaining economic life of the lease or property as of the time of the hearing is less than one year.

STEVE COWPER
GOVERNOR

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

March 3, 1987

The Honorable Ben Grussendorf
Speaker of the House
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Dear Representative Grussendorf:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill relating to the oil and gas properties production tax. The primary effect of the bill is to postpone the application of the "true" economic limit factor (ELF) to the Prudhoe Bay field. The bill also amends the economic limit factor provisions applying to all oil fields so that the ELF is not sensitive to changes in the value of oil.

Existing AS 43.55.011(a) provides that an oil producer must calculate its production (severance) tax by multiplying the nominal rate calculated under AS 43.55.011(b) and (c) by the economic limit factor determined under AS 43.55.013. The ELF is a formula that has the effect of reducing the severance tax rate. In 1981, the legislature made several changes in oil and gas taxes: the income tax was changed to substitute modified apportionment for separate accounting; the nominal rate of the severance tax was increased for some fields; and the application of the ELF to a lease or property with an ELF of more than .7 was suspended until after that lease or property had been in commercial production for 10 years. Ch. 116, SLA 1981. Suspension of application of the ELF was accomplished by providing that, if the ELF was more than .7, then the ELF was considered to be "one." AS 43.55.013(b)(3). Thus, when multiplying the severance tax rate by the ELF, the full amount of the tax is the product.

Only the Prudhoe Bay and Lisburne fields currently have an ELF greater than .7. The Lisburne ELF is expected to fall below .7 after fiscal year 1988, but the Prudhoe Bay ELF is expected to remain about .7 for a number of years. Prudhoe Bay will have been in production for 10 years in June, 1987; thus, absent an amendment to AS 43.55.013(b)(3), the "true" ELF, as calculated under AS 43.55.013(b)(1), will begin to apply to that field at that time.

The fiscal note on the 1981 legislation did not include projections beyond FY 1985, but an analysis by the Legislative Finance Division showed that application of the "true" ELF provision would cause state revenue to fall precipitously in FY 1988. Governor Hammond noted this possibility, but expressed "full confidence in the ability of the legislature to deal at that time" with adverse revenue consequences, should they prove to be serious. Statement of Governor Hammond on signing FCCSSB 524 (ch. 116, SLA 1981); see July 27, 1981 press release on oil and gas legislation, fourth page.

Application of the "true" ELF to Prudhoe Bay would result in serious consequences for the state in the coming fiscal year: state severance collections would be reduced by over 15 percent, and FY 1988 revenue would fall by $93,000,000 (already accounted for in the official "mean" forecast). Section 1 of the attached bill would prevent this precipitous decline in revenue by amending AS 43.55.013(b)(3) to delay the applicability of the true ELF to Prudhoe Bay for an additional five years. Section 1 of the bill also makes a conforming amendment to AS 43.55.013(b)(2) and (4). So long as the "true" ELF does not apply, the severance tax rate will be the full 15 percent of value, or $.80 a barrel, whichever is greater, subject to the adjustment in AS 43.-55.012.

The bill also changes the ELF provisions for all oil fields to remove the sensitivity of the ELF to price fluctuations. An element of the ELF calculation is the "PEL," or "production at the economic limit." The PEL represents the number of barrels a producer must produce in order to recover the costs of production. Currently, the PEL is presumed to be 300 barrels per well per day, but the taxpayer may rebut this presumption at a hearing before the Department of Revenue. At the hearing, the PEL would be calculated by dividing the cost of production into the value of the oil. AS 43.55.013(d). If the price of oil drops, the producer may be able to prove an entitlement to a PEL in excess of 300 barrels; if so, the ELF for that producer will go down. Thus, if prices fall drastically, the state loses severance tax revenue not only because the severance tax is applied against a lower value of oil, but also because the severance tax rate itself goes down as the result of a PEL hearing. Earlier in 1986, because of low prices, we were faced with the possibility that the state might suffer from this double reduction in severance tax revenue.

Section 2 of the attached bill deals with that problem by repealing the portion of existing law that provides for a hearing to change the PEL. The PEL is then simply set at 300 barrels per day. As a result, the ELF will be sensitive to changes in the amount of production, but will no longer be sensitive to fluctuations in price or the costs of production. Section 3 of the bill repeals two subsections in AS 43.55.013 dealing with the two elements of the hearing: costs and values. These changes to not apply to the production of gas.

I urge your early consideration and passage of this bill.

Sincerely,

Steve Cowper
Governor

Alaska State Legislature
House

Official Business

P.O. BOX V
State Capitol
Juneau, Alaska 99811

TO: Rep. Sam Cotten, Co-Chair
Rep. Adelheid Herrmann, Co-Chair
Resources Committee members
FROM: Ned Farquhar, staff Ned Farquhar
SUBJECT: Proposed CSHB 164 (Res)
DATE: March 18, 1987

Attached is a proposed committee substitute for HB 164 which will be presented at today's joint Resources-Finance hearing by Rep. Sund. Administration representatives will be present to explain the import of the changes described below.

Section 1 of the bill repeals the existing ELF formula and the ten-year moratorium provision for certain fields, and reinstates a new ELF formula based on the production of fields rather than wells.

Section 2 eliminates the opportunity for a producer to attempt to rebut the presumption that the PEL (production at the economic limit) is 300 bpd.

Section 3 repeals existing law that relates to the PEL rebuttal and hearing provision, eliminated in Section 2.

Section 4 makes the bill retroactive. There is some question as to the constitutionality of this section because tax payments have already been made, on a monthly basis, under existing law.

Section 5 establishes an immediate effective date for the bill.

cc: Finance Committee members and staff

wo1257hcB
Bannister
3/17/87

Original sponsor: Rules/Governor

IN THE HOUSE BY THE RESOURCES COMMITTEE

CS FOR HOUSE BILL NO. 164 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act relating to the oil and gas properties production tax; and providing for an effective date."

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

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

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

(1-[PEL/TP]) exp ([55,000,000 X WD]/[PEL X TP/Days])

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

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

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

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

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

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

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

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

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

* Sec. 4. Sections 1 - 3 of this Act are retroactive to January 1, 1987.

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

MEMORANDUM State of Alaska

TO Ray Gillespie
Chief of Staff
Office of the Governor

DATE April 18, 1986

FILE NO

TELEPHONE NO

FROM Richard D. Monkman
Deputy Commissioner, Taxation
Department of Revenue

SUBJECT ELF and Severance Taxes

The severance tax on oil compensates the state for the one-time removal of a non-renewable resource. Presently, the severance tax is set at 12.25% of wellhead value or $.80 per barrel, whichever is greater. AS 43.55.011. At present rates of production, the $.80 "floor" guarantees the state a revenue flow of about $450,000,000 per year.

It had generally been assumed that the severance tax "floor" is fixed, and that no matter what happens to the oil market, the state will continue to receive severance taxes at least at $.80 per barrel. In fact, the "floor" has a trap door: the economic limit factor ("the ELF").

The ELF is a complex formula designed to encourage production from declining wells. */ It was supposed to kick in and lower severance taxes as oil runs out. Thus, the producers would have an incentive to keep marginal wells producing, even though the volume produced has declined.

Unfortunately, the statute is written so that the ELF kicks in when price declines as well. If oil prices take another sharp downturn, the ELF could substantially reduce or even eliminate the severance tax revenue flow. At present prices, the ELF may reduce revenues from the

most expensive field (Milne Point) by about $12,000,000 per year, according to OMB. Other fields will not be affected by the ELF until prices drop substantially below present levels.

A simple change to AS 43.55.011 would nail the ELF "trap door" shut and guarantee that the state would receive -- at the very least -- a severance tax of $.80 per barrel of oil produced, regardless of what happens to the oil market. The attached proposed amendment to AS 43.55.011 would protect the severance tax from future drops in the price of oil, and guarantee a steady, dependable revenue flow. The proposed amendment would not increase severance taxes on any oil field at present prices, with the exception of Milne Point.

Attachment

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*/ The ELF formula is as follows:

ELF = (1 - [PEL/TP] exp ([460* WD]/PEL)

WD = well day

PEL = 300 bbl/well day

TP = total production

AS 43.55.013.

RDN:mll

IN THE SENATE/HOUSE BY

SENATE/HOUSE BILL NO. XXX

IN THE LEGISLATURE OF THE STATE OF ALASKA

FOURTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to oil and gas properties production tax and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA

* Section 1. AS 43.55.011 is amended to read:

Sec. 43.55.011. OIL PRODUCTION TAX. (a) There is levied upon the producer of oil a tax for all oil produced from each lease or property in the state, less any oil the ownership or right to which is exempt from taxation. The tax is equal to either the percentage-of-value amount calculated under (b) of this section, multiplied by the economic limit factor determined for the oil production of the lease or property under AS 43.55.013 or the cents-per-barrel amount calculated under (c) of this section, whichever is greater[, MULTIPLIED BY THE ECONOMIC LIMIT FACTOR DETERMINED FOR THE OIL PRODUCTION OF THE LEASE OR PROPERTY UNDER AS 43.55.013]. If the amounts calculated under (b) and (c) of this section are equal, the amount calculated under (b) shall be treated as if it were the greater for purposes of this section.

(b) The percentage-of-value amount equals 12.25 percent of the gross value at the point of production of taxable oil produced on or before June 30, 1981, from the lease or property and 15 percent of the gross value at the point of production of taxable oil produced from the lease or property after June 30, 1981; except that for a lease or property coming into commercial oil production after June 30, 1981, the percentage-of-value amount equals 12.25 percent of the gross value at the point of production of taxable oil produced from the lease or property in the first five years after the start of commercial oil production and equals 15 percent of the gross value at the point of production of taxable oil produced thereafter from the lease or property.

(c) The cents-per-barrel amount equals $0.60 per barrel of taxable old crude oil produced from the lease or property, and $0.80 per barrel for all other taxable oil produced from the lease or property, both as adjusted by AS 43.55.012.

* Sec.2. This Act takes effect immediately in accordance with AS 01.10.070(c).

4/18/86 1416C

LAW OFFICES
PRESTON, THORGRIMSON, ELLIS & HOLMAN
420 L STREET · SUITE 404
ANCHORAGE, ALASKA 99501
(907) 276-1969

MEMORANDUM

TO: Deborah Vogt

FROM: Joseph K. Donohue

DATE: April 28, 1986

RE: **Retroactive Amendments to ELF Factor**

You have requested an opinion concerning the constitutionality of enacting a bill which would retroactively either repeal, or amend the methodology for calculating, the economic limit factor under AS 43.55.013. Specifically, you have asked whether a bill enacted in February 1987 and made retroactive to January 1, 1987 would present any due process problem under the Fifth Amendment to the United States Constitution or under Article I, Section 7 of the Alaska Constitution.

The gross production tax on oil or gas is payable monthly. The tax is due on the 20th day of each month for oil or gas production which occurred during the preceding month. The tax is delinquent if not paid before the end of the month following the month of production. AS 43.55.020(a). Thus, the tax on January production is due on February 20 and is delinquent if not paid on or before February 28.

The economic limit factor is defined in AS 43.55.013 and the Department of Revenue has promulgated a number of regulations which interpret and implement of the provision. See 15 AAC 55.010-.040 and .090. The economic limit factor (ELF) is a concept which is designed to reduce the effective rate of taxation on a producing field as production from that field becomes increasingly marginal. The ELF is multiplied by the percentage-of-value amount set forth in AS 43.55.011(b) or the cents-per-barrel amount calculated under (c) to determine the tax due. AS 43.55.013(b)(2) and (3) provide that during the first 10 years of commercial production from a lease or property, an economic limit factor which is greater than .7 is deemed to be one for purposes of the calculation of tax liability. For example, for the period since 1981 when the .7 threshold was enacted as part of Ch. 116 SLA 1981, the ELF at Prudhoe Bay has been greater than .7 and, therefore, one. This, in turn, means that the ELF does not have any operative effect unless it is found to be less than .7 during the initial 10-year period. For Prudhoe Bay, the 10-year period expires in June 1987.

Attachment 5

3-18-87

The ELF is derived by the use of a rather complicated mathematical formula which in turn is based on certain simplifying assumptions. For oil, the monthly production rate at the economic limit is presumed to be 300 barrels times the number of well days for the lease or property during the month for which the tax is to be paid. AS 43.55.013(d).

The taxpayer may rebut this presumption at a formal hearing by providing clear and convincing evidence of a different monthly production rate. The determination of the monthly production rate at the economic limit is made by dividing the value at the point of production under AS 43.55.013(f) into the average monthly direct operating costs calculated under subsection (e). The hearing must be held before February 15 of a year or within 6 months after commencement of oil production from a lease or property. The results of the hearing "shall be used for all oil production during ...at calendar year from the lease or property." AS 43.55.013(d). Therefore, the statute expressly calls for an annual determination with some retroactive effect on the monthly tax period preceding the hearing on the appropriate monthly production rate. This procedural approach makes administrative sense since it is more efficient to have this potentially difficult issue decided on an annual basis rather than on a monthly basis.

Perhaps the leading case on the question of whether a tax statute can apply retroactively to previous tax periods is Welch v. Henry, 305 U.S. 134 (1938). There, the United States Supreme Court upheld a corporate income tax amendment enacted by Wisconsin in March 1935 which was applicable to receipt of corporate dividends in 1933. The court held that, except for a narrow category of gift taxation cases, the legislature had broad authority to adjust or amend tax liability retrospectively.

The exception to this rule mentioned by the court pertained primarily to instances where voluntary irrevocable actions of taxpayers (e.g., making a bequest) were impacted by the retroactive imposition of a tax. The Supreme Court stated that the critical part of the constitutional test was whether "the nature or amount of the tax could not reasonably have been anticipated by the taxpayer at the time of the particular voluntary act which the statute later made the taxable event." 305 U.S. at 147. The cases cited by the court, e.g. Nichols v. Coollidge, 274 U.S. 531 (1927), and Untermeyer v. Anderson, 276 U.S. 440 (1928), were instances where the donor might well not have acted as he did had he anticipated the tax. The court said that the facts of each case and the nature of the tax would have to be examined to determine if retroactivity gives rise to such harsh and oppressive results that it offends the Constitution. The court stated "there are other forms of taxation whose retroactive imposition cannot be said to be similarly offensive, because their incidence

is not on the voluntary act of the taxpayer." 305 U.S. at 147 The court specifically listed property taxes, income taxes and benefit assessments. 305 U.S. at 147-148. The Supreme Court also noted that it was historically the practice of Congress and the Wisconsin Legislature to enact revenue or tax legislation in a given year and to give it effect to the entire calendar year.

The United States Supreme Court more recently upheld the retroactive increase in the minimum tax on preferences in United States v. Darusmont, 449 U.S. 292 (1981). There, an amendment to the Internal Revenue Code enacted in October 1976 was applied to the entire 1976 tax year. In addition to relying on Welch v. Henry, supra, the Supreme Court cited its earlier decision in Cooper v. United States, 280 U.S. 409, 411 (1930), which upheld the taxation of gains from "prior but recent transactions." The Supreme Court also relied on the analysis of Judge Learned Hand in Cohan v. Commissioners, 39 F.2d 540, 545 (2d Cir. 1930). Judge Hand, in resolving a similar issue involving retroactivity of a tax, held that nobody had a vested right in the rate of taxation. In responding to the question of whether the tax law change was foreseeable, Judge Hand stated that once a system of taxation is already in place, a taxpayer "must be prepared for such possibilities ... ." 39 F.2d at 545.

Other decisions which uphold tax law changes with arguably retroactive impacts in the face of due process challenges include Buttke v. Commissioner, 625 F.2d 262 (8th Cir. 1980) (involving the same minimum tax amendments subsequently upheld by the U.S. Supreme Court in United States v. Darusmont, supra) and Neild v. District of Columbia, 110 F.2d 146, 153 (D.C. Cir. 1940) (involving the constitutionality of the application of a new gross receipts tax measured by the prior year's receipts).

Sometimes retroactive tax laws are challenged under state constitutional provisions barring retrospective laws per se or interference with vested rights. The analytical approach taken by the courts is substantially similar. Under the first line of cases, tax bills which are applied to the entire calendar year in which they are enacted are generally found not to be retrospective in operation. See, e.g., Martin v. Board of Assessment Appeals, 707 P.2d 348 (Colo. 1985). In the Martin case, a law changing the factors to be considered in appraising condominiums which took effect in May 1982 and which was used to assess property values as of January 1, 1982 was upheld. The court held that to find an unconstitutional retrospective effect required a showing of an impairment of a vested right. The court concluded:

> ... [P]roperty owners have no vested right to have their taxable property assessed by particular methods employed in prior years. ... Since the statute only alters the factors which may be considered in determining actual value, it does not impair the taxpayers' vested rights, and therefore is not unconstitutionally retrospective in its operation. 707 P.2d at 352.

A "vested rights" challenge in the context of a severance tax increase led to an identical conclusion. In Belco Petroleum v. State Board of Equalization, 587 P.2d 204 (Wyo. 1978), a 1975 amendment to the state severance tax increased the amount of tax due for the previous year. Under the Wyoming severance tax, a taxpayer paid his 1974 tax in July 1975 computed on the value of gross production for previous year. In upholding the application of the 1975 increase to the July assessment, the court ruled that such an increase was not retrospective but merely called for a tax measured by or computed on the basis of antecedent facts or transactions. The court also found that there was no vested right in a specific tax rate.

On the basis of the foregoing state and federal cases, one can conclude that there is no vested right in a particular tax rate or in a particular method of determining a tax liability. The U.S. Supreme Court cases focus on whether the transaction was taxable during the period of retroactive coverage and whether said period is reasonable, whether the transactions were "prior but recent" in time with respect to the tax law change, whether the change was reasonably foreseeable and whether or not the taxpayer might have voluntarily acted as he did had he but known of the change.

The question before us involves the proposed repeal or modification of the ELF factor in February 1987, effective January 1, 1987. The retroactive period is at most two months. It would adjust a factor which is determined on an annualized calendar basis under present law. The affected taxpayers are those whose decision to invest and produce oil or gas has already been made and whose production is already subject to taxation. In the State of Alaska, amendments to the oil and gas production tax must certainly be viewed as foreseeable. In fact, the legislature has discussed and debated changes to the ELF factor during the 1986 legislative session. Under these circumstances, I conclude that neither state nor federal due process limitations would be abrogated by the repeal or amendment of the ELF factor under consideration here. Furthermore, under the analyses set forth in Martin and Belco Petroleum above, a change in the tax rate or ELF methodology prior to February 20, 1987 might not even be viewed as having "retrospective" operation.

147.JKD:ls

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Bill Version: HB 104
REQUEST
Publish Date:

Revision Date: March 16, 1987
Agency Affected: Revenue
Title: Extending imposition of economic limit factor-oil and gas production tax.
BRU: Audit
Sponsor: Governor
Components:
Requestor: Rules

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
OPERATING						
PERSONAL SERVICES	-	-	-	-	-	-
TRAVEL	-	-	-	-	-	-
CONTRACTUAL	-	-	-	-	-	-
SUPPLIES	-	-	-	-	-	-
EQUIPMENT	-	-	-	-	-	-
LANDS & STRUCTURES	-	-	-	-	-	-
GRANTS, CLAIMS	-	-	-	-	-	-
MISCELLANEOUS	-	-	-	-	-	-
TOTAL OPERATING	-	-	-	-	-	-
CAPITAL	-	-	-	-	-	-
REVENUE	-	-	-	-	-	-

FUNDING: (Thousands of Dollars)

GENERAL FUND	-	-	-	-	-	-
FEDERAL FUNDS	-	-	-	-	-	-
OTHER	-	-	-	-	-	-
TOTAL	-	-	-	-	-	-

POSITIONS:

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

ANALYSIS: Attach a separate page if necessary

Prepared By: Steven E. Kettei Steven E. Kettei
Phone: 465-2320
Division: Audit
Date: March 16, 1987

Approved by Commissioner: H MacLean
Date: 3/16/87
Agency:

Distribution (by Agency preparing fiscal note):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)
Senate Secretary

STATE OF ALASKA
THE LEGISLATURE

LEGISLATIVE AFFAIRS AGENCY

POUCH Y STATE CAPITOL
JUNEAU ALASKA 99811
907 465 3800

MEMORANDUM March 17, 1987

SUBJECT: Retroactivity of proposed committee substitute (CSHB 164(Resources)

TO: Representative Sam Cotten
Chair, House Resources Committee

FROM: Theresa L. Bannister TB
Legislative Counsel

This memo accompanies the committee substitute that you have requested for HB 164, a bill relating to the oil and gas properties production tax. That bill includes a provision that would make the bill retroactive to January 1, 1987.

Please be aware that the retroactivity provision may violate federal and state constitutional provisions against enacting ex post facto laws (art. I, sec. 15 of the Constitution of the State of Alaska; art. I, sec. 9, cl. 3 of the U.S. Constitution). In this instance, the tax is incurred and remitted on a monthly schedule. AS 43.55.020. Therefore, the taxpayers under the chapter will have already paid or become obligated to pay an amount certain for the months of January, 1987, through the month before the month of enactment.

You may wish to make the bill retroactive to the beginning of the month in which the bill takes effect. That would not create retroactivity problems since the tax liability would not have become due yet.

If I may be of further assistance, please advise.

TLB:mkr
m10/011

Enclosure

Attachment 4

THE ECONOMIC LIMIT FACTOR FOR OIL

Alaska encourages new production and complete recovery through the application of an economic limit factor to the basic tax rate. The economic limit factor (ELF) decreases the effective rate of the tax as production decreases.

The economic limit factor for oil is:

$$ELF = 1 - \frac{PEL}{TP} \exp \frac{460 \times WD}{PEL}$$

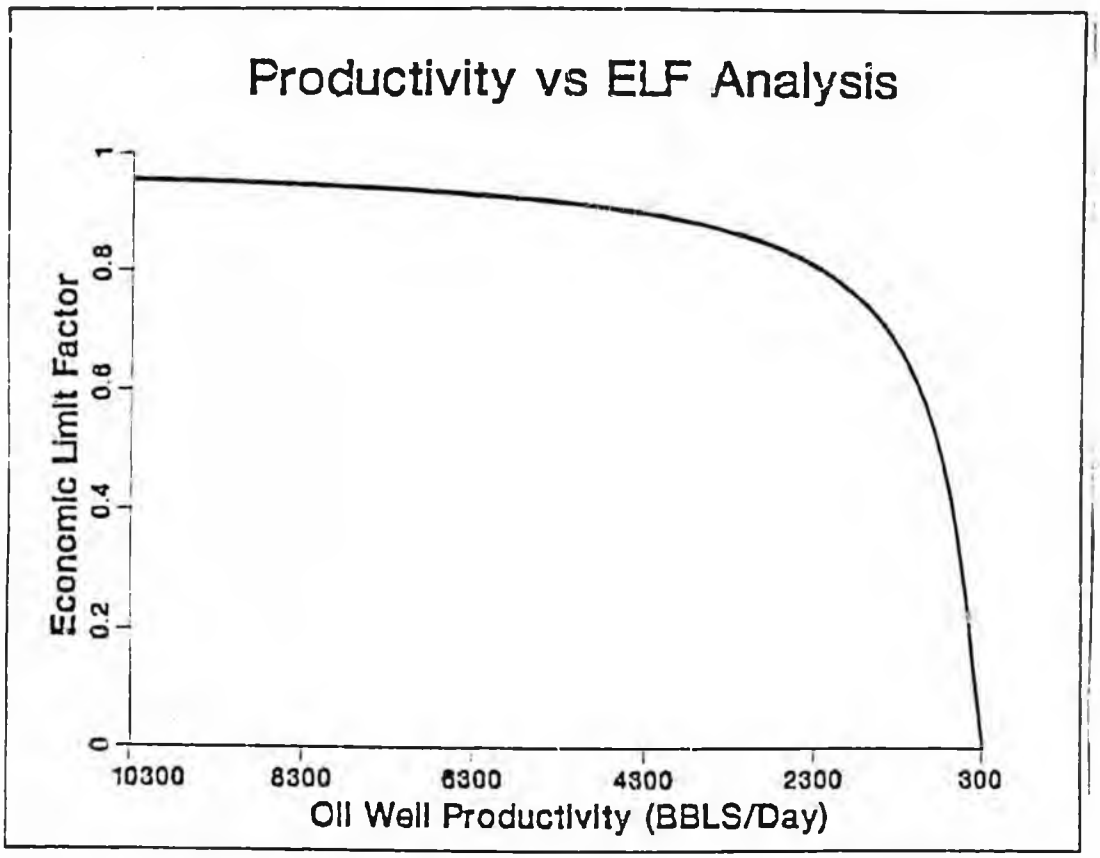
where PEL = monthly production at the economic limit
TP = the total production during the month for which the tax is to be paid
WD = the total number of well days in the month for which the tax is to be paid
and where "exp" indicates that the expression following it is an exponent.

During the first 10 years of oil production if the ELF is computed to be greater than 0.7, the factor used will be one. If the computed ELF is 0.7 or less, the actual computed factor is applied. After the first 10 years the actual computed factor is used in all cases.

The monthly production rate at the economic limit is presumed to be 300 barrels times the number of well days for the lease or property during the month for which the tax is to be paid. The taxpayer may rebut the presumption by offering clear and convincing evidence supporting a different monthly production rate at the economic limit.

A well is producing at the economic limit when the value of production during the month equals the average monthly direct operating cost for oil production. Direct operating costs include only royalty, production supplies, purchased fuel, routine maintenance, and wages and benefits of employees working on the production operations. The average direct operating cost is determined by using a period of at least four consecutive months.

The following is a graph of the ELF showing how the factor decreases as the production of the well declines:



To compute the amount of production (severance) tax due, the tax rate is multiplied by the value of the oil produced with that result multiplied by the ELF.

EXAMPLES USING THE ELF

The following are two examples using the ELF. For both assume: (1) the property went into production in 1974; (2) the applicable nominal tax rate is 15%; (3) the tax is being computed for the month of October, 1981; (4) the properties operated 70 well days (WD); (5) production at the economic limit was 300 bbl/day; (6) 87.5% of the total production is subject to tax.

A. Total barrels produced for the month: 400,000 barrels (TP)
Value of production at well head: $8,750,000
Production at the Economic Limit: 300 bbl/day x 70 well days = 21,000 (PEL)

$$ELF = 1 - \frac{21,000}{400,000} \exp \frac{460 \times 70}{21,000}$$

$$ELF = 0.920636$$

Because the production is in the first 10 years and ELF is greater than 0.7, ELF will be treated as equal to 1.

$$\$8,750,000 \times 87.5\% \times 15\% \times 1 = \$1,148,437.50$$

Value of Production	Taxable Prod.	Tax Rate	ELF	Tax Amount Due State

The effective tax rate on the taxable oil = 15%

B. Total barrels produced for the month: 40,000 barrels (TP)
Value of production at well head: $875,000
Production at the Economic Limit: 300 bbl/day x 70 well days = 21,000 (PEL)

$$ELF = 1 - \frac{21,000}{40,000} \exp \frac{460 \times 70}{21,000}$$

$$ELF = 0.319348$$

$$\$875,000 \times 87.5\% \times 15\% \times 0.319348 = \$36,675.12$$

Value of Production	Taxable Prod.	Tax Rate	ELF	Tax Amount Due State

Effective tax rate on the taxable oil = 4.19%.

As can be seen from the graph of the ELF and the examples above, as production approaches the economic limit, ELF approaches zero.

Because of the application of the ELF, the effective tax rate on taxable production varies between 0 and 15%.

THE ECONOMIC LIMIT FACTOR FOR GAS

Alaska encourages new production and complete recovery through the application of an economic limit factor to the basic tax rate. The economic limit factor (ELF) decreases the effective rate of the tax as production decreases.

The economic limit factor for gas is:

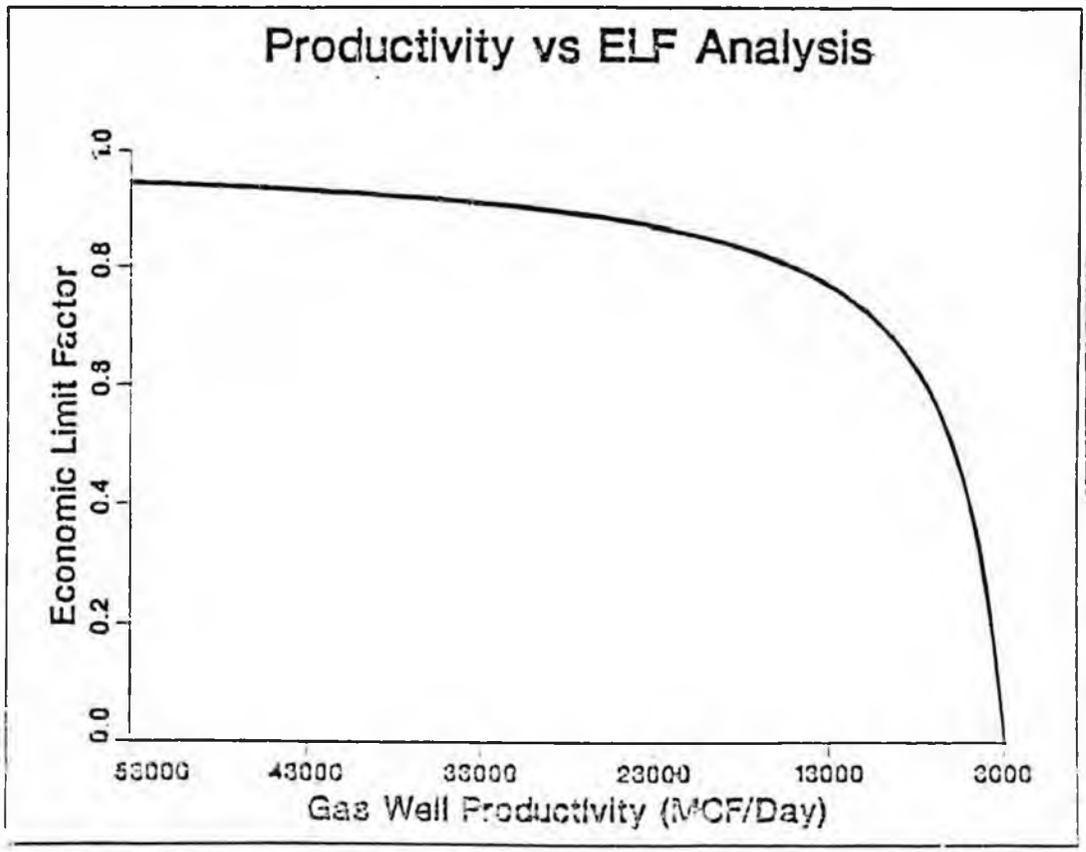
$$ELF = 1 - \frac{PEL}{TP}$$

where PEL = monthly production at the economic limit
TP = the total production during the month for which the tax is to be paid

The monthly production rate at the economic limit is presumed to be 3,000 mcf times the number of well days for the lease or property during the month for which the tax is to be paid. The taxpayer may rebut the presumption by requesting a formal hearing and offering clear and convincing evidence supporting a different monthly production rate at the economic limit.

A well is producing at the economic limit when the value of production during the month equals the average monthly direct operating cost for gas production. Direct operating costs include only royalty actually and currently paid, production supplies, purchased fuel, routine maintenance, and wages and benefits of employees working on the production operations. The average operating cost is determined by using a period of at least four consecutive months.

The following is a graph of the ELF showing how the factor decreases as the production of the well approaches the economic limit:



To compute the amount of production (severance) tax due, the tax rate is multiplied by the value of the oil produced with that result multiplied by the ELF.

EXAMPLES USING THE ELF:

For both examples assume: (1) the applicable nominal tax rate is 10%; (2) the tax is being computed for the month of October, 1981; (3) the properties operated 70 well days; (4) production at the economic limit was 3,000 mcf/day; (5) 1/8 of the gas production is exempt from tax; (6) the well head value of the gas is $.70/mcf.

A. Total Production (TP): 1,050,000 mcf
Total Value of Production: $735,000.00
PEL = 3,000 mcf/day x 70 well days (WD) = 210,000

$$ELF = 1 - \frac{210.000}{1,050,000}$$

$$ELF = 0.800000$$

$$\$735,000 \times 87.5\% \times 10\% \times 0.800000 = \$51,450.00$$

Value of Production	Taxable Prod.	Tax Rate	ELF	Tax Amount Due State

The effective tax rate on the taxable gas is 8%.

The effective tax rate on the total production is 7%.

B. Total Production (TP): 262,500 mcf
Total Value of Production: $183,750.00
PEL = 3,000 mcf/day x 70 well days (WD) = 210,000

$$ELF = 1 - \frac{210.000}{262,500}$$

$$ELF = 0.200000$$

$$\$183,750 \times 87.5\% \times 10\% \times 0.200000 = \$3,215.63$$

Value of Production	Taxable Prod.	Tax Rate	ELF	Tax Amount Due State

The effective tax rate on the taxable gas is 2%.

The effective tax rate on the total production is 1.75%.

Because of the application of the ELF, the effective tax rates on total gas production vary between 0 and 10%.

M E M O R A N D U M

STATE OF ALASKA

Department of Revenue

Petroleum Research Section

February 11, 1987

To: Vincent D. Wright, Chief of Research

From: Charles Logsdon, Petroleum Economist

Subject: New ELF

Per your request, I have examined the revenue and production impacts associated with changing the ELF to consider field size. This modification is similiar to the one outlined in HB 545 and presented in analysis done by myself in papers prepared for presentation to the tax committee.

Briefly, the modification is accomplished by introducing a scaling factor and also the rate of field production into the exponent of the current ELF formula. The value of this scaling factor determines at what level of production the resulting ELF is greater than under the current law. For instance, in HB 545 the factor has a value of 37,000,000 which, given a PEL of 300, translates into a break point of roughly 80,000 bbls/day. The analysis I did for the tax committee last December under the OMB modified alternative ELF used a factor with a value of 45,500,000. This translates into a break point of roughly 100,000 bbls./day. In the analysis contained in this memo I have used a factor value of 55,000,000, which results in a break point of roughly 120,000 bbls./day. A breakpoint of 120,000 bbls./day would increase the effective severance tax rate on Prudhoe Bay and Kuparuk production. It would reduce the effective severance tax rate on all other oil fields now producing or likely to produce in the next two years, including all Cook Inlet fields, Milne Point, Lisburne, and Endicott. This is because none of these fields are projected to produce at or above the 120,000 bbl./day level. I have attached a computer printout which illustrates the sensitivity of the change in effective tax rate on each field of different assumptions for production and well count using the 55 million scaling factor

Sam's Copy

To illustrate the effect of different scaling factors on the ELF calculation I have developed the following tables. The first table illustrates the break point for various values of the scaling factor i.e. the total field production which would result in a lower ELF than that currently calculated.

Factor	Breakpoint
20000000	43479 bbls./day
30000000	65219
40000000	86958
50000000	108698
60000000	130438
70000000	152177
80000000	173917
90000000	195656
100000000	217396
110000000	239136

The following table shows the calculated ELF by North Slope field for various values of the scaling factor.

			Factor/ELF							
Field	Prod.	Prod/Well	30MM	40MM	50MM	60MM	70MM	80MM	90MM	100MM
Prudhoe	1510000	2900	.9928	.9904	.9880	.9856	.9833	.9809	.9785	.9762
Kuparuk	230000	885	.8353	.7866	.7408	.6977	.6571	.6188	.5828	.5488
Milne	20000	900	.1317	.0870	.0341	.0173	.0088	.0045	.0023	.0012
Endicott	70000	900	.5603	.4619	.3808	.3140	.2588	.2134	.1759	.1450
Lisburne	35000	1400	.5021	.3990	.3171	.2521	.2003	.1592	.1266	.1006
West Sak	100000	550	.4545	.3495	.2687	.2066	.1589	.1221	.0939	.0722

The following two tables illustrate the revenue and production impact of modifying the ELF to include field size in the formulas using the 55 millon scaling factor. The results were generated by the PETREV monte carlo simulation model that DOR uses to forecast petroleum production revenues. Interestingly the revenue impacts are not that much different from those contained in the fiscal note prepared last year concerning HB 545. The average expected production impacts are also relatively low. The mildly negative impact on Lisburne production is a result of a slightly higher TAPS tariff, due to slightly lower throughput, more than offsetting the lower severance tax burden. The negative impact on West Sak reflects the probability that should this project become economic, production may exceed 120,000 bbls/day from a large number of low productive wells.

Revenue Impact of Field Size ELF, Field Factor = 55 Million
(Millions $)

Fiscal Year	Delta 30%	Delta Mean
1987	10.45	10.93
1988	88.18	112.29
1989	98.14	136.23
1990	109.61	147.04
1991	96.13	132.35
1992	94.18	127.23
1993	91.30	124.34
1994	81.51	118.59
1995	77.60	112.06
1996	69.74	98.74
1997	62.21	92.73
1998	49.52	82.14
1999	43.91	75.70
2000	33.42	72.90
2001	31.73	72.49
2002	27.43	73.42
2003	28.46	73.09
2004	23.53	62.25
2005	20.23	47.44

Production Impact of Expo55 (Million bbls/yr)

Fiscal Year	Prudhoe Bay	Kuparuk	Milne Point	Endicott	Lisburne	West Sak	Other Onshore	Other Offshore	Total
1987	0	0	.05	[illegible]	-.03	0	0	0	.02
1988	-1.97	-.32	.23	.65	-.05	0	0	0	-1.46
1989	-1.77	-.33	.37	2.16	-.06	0	0	0	.37
1990	-1.59	-.33	.39	2.13	-.07	0	0	0	.53
1991	-1.46	-.29	.39	2.1	-.1	0	0	0	.64
1992	-1.41	-.26	.36	2.01	-.1	0	.28	0	.88
1993	-1.25	-.23	.38	1.94	-.12	0	.51	0	1.23
1994	-2.59	-.38	.32	1.41	-.47	0	.53	0	-1.18
1995	-2.24	-.37	.29	1.69	-.41	-.63	.56	0	-1.11
1996	-2.16	-.3	.18	1.22	-.37	-.77	.48	0	-1.72
1997	-3.12	-.27	.19	.77	-.31	-1.13	.41	0	-3.46
1998	-2.57	-.16	.18	.41	-.28	-1.13	.38	.13	-3.04
1999	-2.18	-.1	.16	.06	-.21	-1.23	.58	.17	-2.75
2000	-1.93	-.07	.03	-.18	-.17	-1.23	.51	.18	-2.86
2001	-1.77	-.02	-.03	-.3	-.11	-1.26	.43	.21	-2.85
2002	-1.46	-.01	-.09	-.36	-.07	-1.32	.34	.23	-2.74
2003	-1.31	0	-.06	-.33	-.02	-1.12	.24	.23	-2.37
2004	-1.27	-.01	.01	-.34	-.02	-1.11	.22	.23	-2.29
2005	-1.13	-.04	-.03	-.26	-.04	-1.08	.18	.28	-2.12
Total	-33.18	-3.49	3.32	14.78	-3.01	-12.01	5.65	1.66	-26.28

THE EFFECT OF THE FIELD SIZE ELF ON THE PRUDHOE BAY SEVERANCE TAX RATE

	Producing Wells	Production (Bbl/day)	Current Lif	New ELF Field Size Factor = 55000000	Current Effective Tax Rate FY 1989	New Effective Tax Rate FY 1989	Increased Effective Tax Rate FY 1988
December DOR 1988 Mean	520	1510000	.8460	.9833	.1269	.1475	.0206
			Sensitivity Table				
	500	1450000	.8458	.9863	.1269	.1479	.0211
		1500000	.8508	.9872	.1276	.1481	.0205
		1525000	.8532	.9876	.1280	.1481	.0202
		1550000	.8555	.9880	.1283	.1482	.0199
		1575000	.8577	.9884	.1287	.1483	.0196
	520	1450000	.8399	.9857	.1260	.1479	.0219
		1500000	.8450	.9867	.1268	.1480	.0212
		1525000	.8475	.9871	.1271	.1481	.0209
		1550000	.8499	.9875	.1275	.1481	.0206
		1575000	.8522	.9879	.1278	.1482	.0204
	540	1450000	.8339	.9851	.1251	.1478	.0227
		1500000	.8393	.9861	.1259	.1479	.0220
		1525000	.8419	.9866	.1263	.1480	.0217
		1550000	.8443	.9870	.1266	.1481	.0214
		1575000	.8467	.9874	.1270	.1481	.0211
	550	200000	.0691	.2024	.0104	.0304	.0200
		225000	.1318	.3406	.0198	.0511	.0313
		250000	.1913	.4533	.0287	.0680	.0393
		275000	.2454	.5429	.0368	.0814	.0446
		300000	.2939	.6139	.0441	.0921	.0480

THE EFFECT OF THE FIELD SIZE ELF ON THE KUPARUK SEVERANCE TAX RATE

	Producing Wells	Production (Bbl/day)	Current ELF	New ELF Field Size Factor = 55000000	Current Effective Tax Rate FY 1988	New Effective Tax Rate FY 1988	Increased Effective Tax Rate FY 1988
December DOR 1988 Mean	260	250000	.5299	.6569	.0795	.0985	.0191
		Sensitivity Table					
	250	200000	.4864	.6500	.0730	.0975	.0245
		225000	.5370	.7187	.0806	.1078	.0272
		250000	.5797	.7698	.0868	.1155	.0287
		275000	.6137	.8087	.0921	.1213	.0293
		300000	.6433	.8388	.0965	.1258	.0293
	260	200000	.4686	.6357	.0703	.0953	.0251
		225000	.5206	.7069	.0781	.1060	.0279
		250000	.5636	.7601	.0845	.1140	.0295
		275000	.5996	.8006	.0899	.1201	.0301
		300000	.6302	.8319	.0945	.1248	.0303
	270	200000	.4511	.6213	.0677	.0932	.0255
		225000	.5044	.6951	.0757	.1043	.0286
		250000	.5486	.7504	.0823	.1126	.0303
		275000	.5857	.7925	.0879	.1189	.0310
		300000	.6172	.8250	.0926	.1238	.0312
	280	200000	.4338	.6069	.0651	.0910	.0260
		225000	.4884	.6833	.0733	.1025	.0292
		250000	.5337	.7406	.0801	.1111	.0310
		275000	.5718	.7843	.0858	.1176	.0319
		300000	.6043	.8181	.0906	.1227	.0321

THE EFFECT OF THE FIELD SIZE ELF ON THE MILNE SEVERANCE TAX RATE

	Producing Wells	Production (Bbl/day)	Current ELF	New ELF Field Size Factor = 55000000	Current Effective Tax Rate FY 1988	New Effective Tax Rate FY 1988	Decreased Effective Tax Rate FY 1988
December DOR 1988 Mean	22	20000	.5111	.0074	.0663	.0011	-.0651
		Sensitivity Table					
	15	10000	.3928	0	.0430	0	-.0429
		15000	.5787	.0128	.0702	.0016	-.0685
		20000	.6765	.0967	.0922	.0118	-.0710
		25000	.7376	.2333	.0901	.0286	-.0618
		30000	.7794	.3701	.0955	.0454	-.0501
	20	10000	.2454	0	.0301	0	-.0301
		15000	.4569	.0019	.0560	.0002	-.0557
		20000	.5787	.0380	.0702	.0047	-.0662
		25000	.6565	.1336	.0801	.0164	-.0641
		30000	.7102	.2557	.0870	.0313	-.0557
	10	10000	0	0	0	0	0
		15000	.0818	0	.0101	0	-.0104
		20000	.2454	.0002	.0301	0	-.0300
		25000	.3662	.0083	.0449	.0010	-.0439
		30000	.4569	.0441	.0560	.0054	-.0506
	60	10000	0	0	0	0	0
		15000	0	0	0	0	0
		20000	.0295	0	.0036	0	-.0036
		25000	.1420	.0001	.0174	0	-.0174
		30000	.2454	.0037	.0301	.0005	-.0296

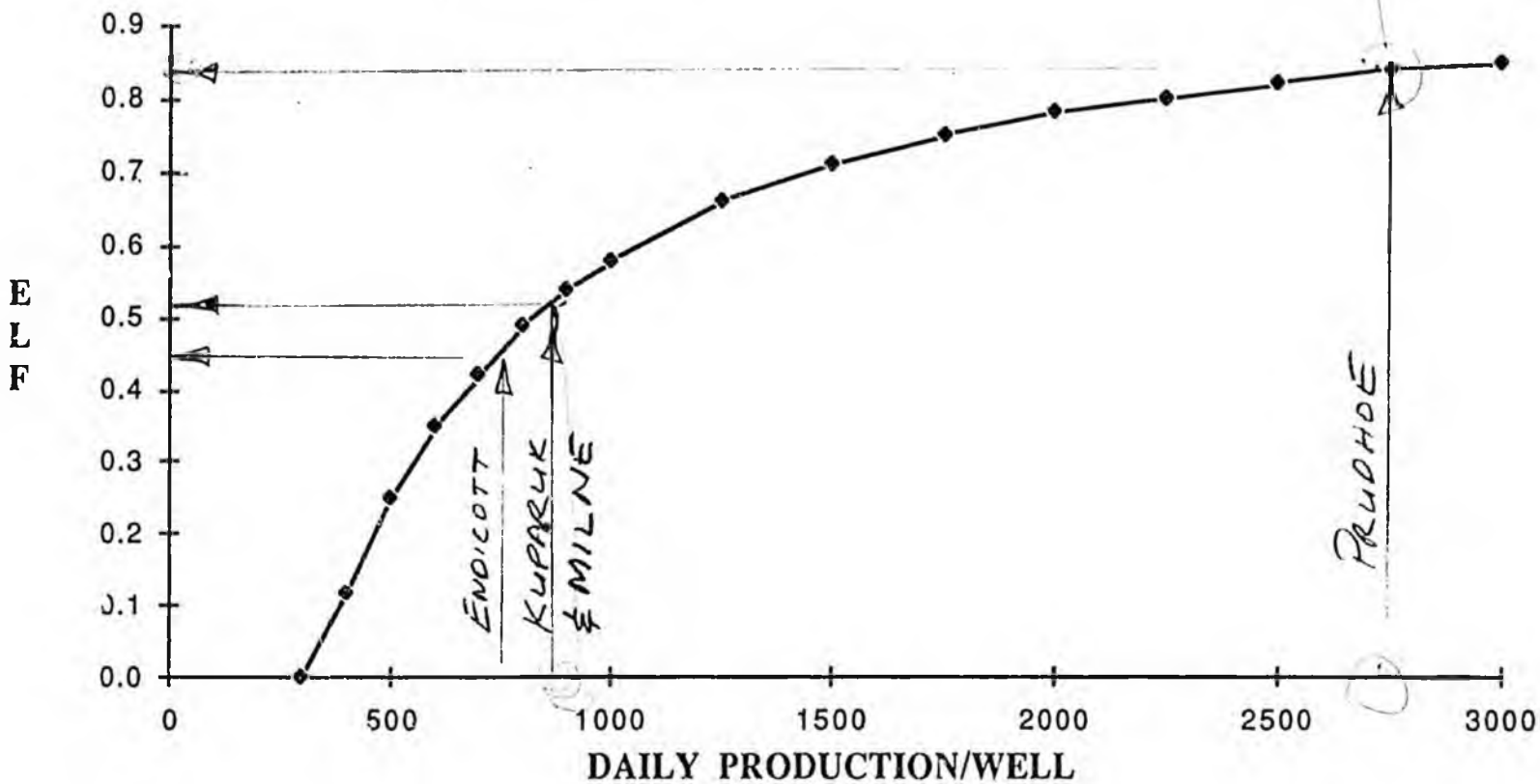
THE EFFECT OF THE FIELD SIZE ELF ON THE ENDICOTT SEVERANCE TAX RATE

	Producing Wells	Production (Bbl/day)	Current ELF	New ELF Field Size Factor = $5000000	Current Effective Tax Rate FY 1988	New Effective Tax Rate FY 1988	Decreased Effective Tax Rate FY 1988
December 1988 Mean	69	62500	.5397	.2227	.0661	.0273	-.0388
		Sensitivity Table					
	50	40000	.4864	.1160	.0596	.0142	-.0454
		60000	.6433	.4152	.0789	.0509	-.0279
		80000	.7273	.6214	.0891	.0761	-.0130
		100000	.7794	.7423	.0955	.0909	-.0045
		120000	.8149	.8155	.0998	.0999	.0001
	75	40000	.2915	.0226	.0345	.0028	-.0317
		60000	.4864	.2378	.0596	.0291	-.0305
		80000	.6027	.4692	.0738	.0575	-.0164
		100000	.6765	.6267	.0829	.0768	-.0061
		120000	.7273	.7202	.0891	.0882	.0001
	90	40000	.1785	.0058	.0219	.0007	-.0212
		60000	.3298	.1609	.0404	.0197	-.0207
		80000	.5619	.3892	.0652	.0477	-.0175
		100000	.6172	.5616	.0756	.0688	-.0068
		120000	.6765	.6775	.0829	.0830	.0001
	110	40000	.0691	.0003	.0085	0	-.0084
		60000	.2939	.0872	.0360	.0107	-.0253
		80000	.4424	.2956	.0542	.0362	-.0180
		100000	.5411	.4799	.0663	.0588	-.0075
		120000	.6107	.6118	.0748	.0749	.0001

THE EFFECT OF THE FIELD SIZE ELF ON THE LISBURNE SEVERANCE TAX RATE

	Producing Wells	Production (Bbl/day)	Current Elf	New ELF Field Size Factor = 55000000	Current Effective Tax Rate FY 1988	New Effective Tax Rate FY 1988	Decreased Effective Tax Rate FY 1988
December DOR 1988 Mean	20	35000	.7495	.2055	.1124	.0428	-.0696
		Sensitivity Table					
	20	25000	.6565	.1336	.0985	.0200	-.0784
		35000	.7495	.3734	.1124	.0560	-.0564
		50000	.8220	.6258	.1233	.0939	-.0294
		75000	.8890	.8156	.1320	.1223	-.0097
		100000	.9095	.8920	.1364	.1339	-.0025
	35	25000	.4338	.0101	.0651	.0020	-.0623
		35000	.5787	.1544	.0868	.0232	-.0637
		50000	.6967	.4213	.1045	.0632	-.0413
		75000	.7935	.6916	.1190	.1037	-.0153
		100000	.8436	.8160	.1265	.1224	-.0041
	50	25000	.2454	.0012	.0368	.0002	-.0366
		35000	.4240	.0533	.0636	.0080	-.0556
		50000	.5787	.2704	.0868	.0406	-.0462
		75000	.7102	.5796	.1065	.0869	-.0196
		100000	.7794	.7423	.1169	.1114	-.0056
	80	25000	.0072	0	.0011	0	-.0011
		35000	.1695	.0023	.0254	.0003	-.0251
		50000	.3669	.0909	.0550	.0136	-.0414
		75000	.5536	.3096	.0830	.0584	-.0246
		100000	.6565	.6046	.0985	.0907	-.0078

CURRENT LAW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DAILY PRODUCTION/WELL
ENDICOTT
KUPARUK
& MILNE
PRUDHOE

ALTERNATE ELF