

ALASKA LEGISLATURE SPECIAL COMMITTEE/SUBJECT FILES 8672

2331 SCOMM 96: HOUSE SPEC. COMM. ON OIL & GAS, 1995-1996

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

OIL-RELATED POPULATION (Table 6)

The jobs produced by the development and production from the marginal field could be filled either by currently unemployed residents or by new residents who would migrate to the state. In either case it is likely that population would increase through immigration to reestablish the equilibrium unemployment rate in the labor market. (In some cases, particularly in rural parts of the state, job creation might not stimulate immigration, but we do not consider this case.)

The population response will depend upon the characteristics of the households of the workers who take these jobs. Based on data from the Census, we find that households with an oil industry or construction industry worker tend to be slightly larger than the average household because they are more likely to be a traditional household of husband and wife. For this reason they have a larger average number of children as well as adults, and also a larger number of workers per household. We assume the new Alaskan households have characteristics similar to those already here in terms of size, number of school-aged children per household, and employed persons per household. We assume that the number of people aged 65 and over in these households is zero.

Since the average household has more than one employed person, two new households can supply one worker to fill one of the other jobs created by the development and production from the marginal field. We assume that the mix of occupations within these households matches the newly created jobs so that the new migrant household workers are not constrained in their employment opportunities.

Using these assumptions, we calculate that the economic activity surrounding the development of the marginal field will generate a population increase of 2,762 (which will be allocated over the period of field development), and the production of the field will generate a population increase of 293 annually.

TABLE 6: MARGINAL FIELD ANALYSIS: OIL RELATED POPULATION

	TOTAL DEVELOPMENT				ANNUAL PRODUCTION			
	TOTAL	DIRECT	VENDOR	INDIRECT INDUCED	TOTAL	DIRECT	VENDOR	INDIRECT INDUCED
RESIDENT JOBS	1,482	572	201	709	157	60	21	76
HOUSEHOLD SIZE (A)		3.07	3.07	2.75		3.07	3.07	2.75
ADULTS / HH (B)		2.04	2.04	1.72		2.04	2.04	1.72
SCHOOL AGED KIDS / HH (C)		0.69	0.69	0.61		0.69	0.69	0.61
JOBS PER HH (D)		1.72	1.72	1.41		1.72	1.72	1.41
HOUSEHOLDS	952	332	117	503	101	35	12	54
ADULTS	1,782	678	238	865	189	72	25	93
SCHOOL AGED KIDS	617	229	81	307	65	24	8	33
POP	2,762	1,021	359	1,383	293	108	37	148

ASSUME ALL INDIRECT AND INDUCED JOBS HELD BY RESIDENTS

- (A) 1990 CENSUS PUBLIC USE SAMPLE
- (B) POPULATION 18 TO 64 IN HOUSEHOLDS, 1990 CENSUS PUBLIC USE SAMPLE
- (C) POPULATION 5 TO 17 IN HOUSEHOLDS, 1990 CENSUS PUBLIC USE SAMPLE
- (D) JOBS PER HOUSEHOLD IS RATIO OF JOBS PER HH TO EMPLOYEES PER HH MULTIPLIED BY THE INDUSTRY SPECIFIC EMPLOYEES PER HOUSEHOLD FROM 1990 CENSUS PUBLIC USE SAMPLE

OIL AND GAS	0.9639	1.79	1.73
CONSTRUCTION	0.9639	1.87	1.80
ALL OTHER	0.9639	1.46	1.41

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

STATE GOVERNMENT COSTS OF OIL-RELATED POPULATION (Table 7)

The population increase induced by the economic activity in the development and production from the marginal field will require public services from state government. The cost of these services will depend upon the characteristics of the new households. Based on an analysis of the 1990 state budget (Table 13), we calculated an annual general fund operating cost per adult in a household without unemployment to be \$2,980 and the annual cost per school-aged child to be \$5,240. We assume that the cost of state government per child below the age of five is zero and that none of the induced population is over the age of 65. We assume that the capital cost of state government to the new population is 20% of the operating cost.

Since the increase in employment will induce an increase in population not only to fill the jobs but also to reestablish the unemployment rate, we assume a slight increase in the unemployed population through immigration. The adult portion of this population has a larger public service requirement than the new employed population since they will require use of the safety net (welfare, job training, medicaid, etc.), so their per capita operating cost is estimated at \$5,530 per adult.

Only about two-thirds of the state budget is funded out of the state general fund, with the rest financed by federal transfers, program receipts, etc. We assume that the sources of funds for this portion of the budget will automatically increase with the increase in population and will not result in a deficit requiring a contribution from the general fund.

Based on these assumptions we calculate the cost to state government imposed by the increase in population associated with the development and production from the marginal field. It is \$11.3 million for field development and \$1.2 annually for field production. Over the 20-year life of the field, this accumulates to \$24 million.

TABLE 7: MARGINAL FIELD ANALYSIS: PUBLIC EXPENDITURE REQUIREMENTS

		TOTAL DEVELOPMENT				ANNUAL PRODUCTION			
		TOTAL	DIRECT	VENDOR	INDIRECT INDUCED	TOTAL	TOTAL	TOTAL	TOTAL
HOUSEHOLDS ASSOCIATED WITH OIL ACTIVITY		952	332	117	503	101	35	12	54
ADULTS		1,752	678	238	865	189	72	25	93
SCHOOL AGED KIDS		617	229	81	307	65	24	8	33
POPULATION		2,762	1,021	359	1,383	293	108	37	148
NEW RESIDENTS REQUIRING PUBLIC SERVICES									
HOUSEHOLDS OF WORKERS	ADULTS	1,752	678	238	865	189	72	25	93
	S A KIDS	617	229	81	307	65	24	8	33
UNEMPLOYED (A)	ADULTS	125	47	17	61	13	5	2	6
	S A KIDS	43	16	6	21	5	2	1	2
TOTAL	ADULTS	1,906	726	255	925	202	77	27	99
	S A KIDS	660	245	86	328	70	26	9	35
PER CAPITA COST OF STATE OPERATING SERVICES (GENERAL FUND) (B)									
EMPLOYED	ADULTS	\$2,980	\$2,980	\$2,980		\$2,980	\$2,980	\$2,980	
	S A KIDS	\$5,240	\$5,240	\$5,240		\$5,240	\$5,240	\$5,240	
UNEMPLOYED	ADULTS	\$5,530	\$5,530	\$5,530		\$5,530	\$5,530	\$5,530	
	S A KIDS	\$5,240	\$5,240	\$5,240		\$5,240	\$5,240	\$5,240	
TOTAL COST OF STATE OPERATING SERVICES (MILLION \$)		\$9.46	\$3.57	\$1.25	\$4.63	\$1.00	\$0.38	\$0.13	\$0.50
EMPLOYED	ADULTS	\$5.31	\$2.02	\$0.71	\$2.58	\$0.56	\$0.21	\$0.07	\$0.28
	S A KIDS	\$3.23	\$1.20	\$0.42	\$1.61	\$0.34	\$0.13	\$0.04	\$0.17
UNEMPLOYED	ADULTS	\$0.69	\$0.26	\$0.09	\$0.33	\$0.07	\$0.03	\$0.01	\$0.04
	S A KIDS	\$0.23	\$0.08	\$0.03	\$0.11	\$0.02	\$0.01	\$0.00	\$0.01
PER CAPITA COST OF STATE CAPITAL SERVICES (GENERAL FUND)									
EMPLOYED	ADULTS	\$596	\$596	\$596		\$596	\$596	\$596	
	S A KIDS	\$1,048	\$1,048	\$1,048		\$1,048	\$1,048	\$1,048	
UNEMPLOYED	ADULTS	\$596	\$596	\$596		\$596	\$596	\$596	
	S A KIDS	\$1,048	\$1,048	\$1,048		\$1,048	\$1,048	\$1,048	
TOTAL COST OF STATE CAPITAL SERVICES (MILLION \$)		\$1.83	\$0.69	\$0.24	\$0.90	\$0.19	\$0.07	\$0.03	\$0.10
EMPLOYED	ADULTS	\$1.06	\$0.40	\$0.14	\$0.52	\$0.11	\$0.04	\$0.01	\$0.06
	S A KIDS	\$0.65	\$0.24	\$0.08	\$0.32	\$0.07	\$0.03	\$0.01	\$0.03
UNEMPLOYED	ADULTS	\$0.07	\$0.03	\$0.01	\$0.04	\$0.01	\$0.00	\$0.00	\$0.00
	S A KIDS	\$0.05	\$0.02	\$0.01	\$0.02	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL COST OF STATE SERVICES									
ANNUAL	OPERATING					\$1.00	\$0.38	\$0.13	\$0.50
	CAPITAL					\$0.19	\$0.07	\$0.03	\$0.10
	TOTAL					\$1.20	\$0.45	\$0.16	\$0.59
LIFE OF PROJECT	OPERATING	\$9.46	\$3.57	\$1.25	\$4.63	\$20.08	\$7.53	\$2.62	\$9.93
	CAPITAL	\$1.83	\$0.69	\$0.24	\$0.90	\$3.88	\$1.45	\$0.51	\$1.92
	TOTAL	\$11.28	\$4.26	\$1.50	\$5.53	\$23.96	\$8.98	\$3.13	\$11.85

- (A) RATIO OF UNEMPLOYED NEW RESIDENTS TO EMPLOYED SOURCE: ADOL 7%
- (B) PER CAPITA ANALYSIS USES 1990 BUDGET--SEE TABLE 13
- (C) PER CAPITA ANNUAL CAPITAL COST ASSUMED TO BE 20% OF OPERATING COST
THIS IS ROUGHLY BASED ON THE HISTORICAL RATIO OF DEBT SERVICE AND CAPITAL BUDGETS TO THE OPERATING BUDGET
- NEW RESIDENT SHARE OF EMPLOYED POPULATION 100%
IF THE CURRENTLY RESIDENT UNEMPLOYED FILLED SOME OF THE JOBS THEN THE COST TO THE PUBLIC SECTOR WOULD BE MUCH LOWER
ALSO IF THE JOBS WERE FILLED BY RESIDENTS WHO WOULD OTHERWISE LEAVE THE STATE THE COST WOULD BE LOWER IF THEIR LEAVING CREATED EXCESS CAPACITY IN THE PUBLIC CAPITAL STOCK
- ASSUME NON-GENERAL FUND REVENUES COVER NON-GENERAL FUND EXPENDITURES
THIS IS PRIMARILY FEDERAL FUNDS

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

STATE GOVERNMENT-RELATED EMPLOYMENT (Table 8)

The delivery of the state public services associated with the costs calculated in the previous table will require the hiring of additional state employees and the contracting of construction firms to build the required public facilities. We estimate state government employment to meet this demand to be 79 during the development phase of the project and 8 annually during production. Construction employment is 9 and 1, respectively.

This public sector employment will also generate jobs in the private sector through the multiplier effect as public employees spend their paychecks and as state government purchases the services of private firms and procures supplies from private firms. Using the Alaska Input-Output model, we calculate that these multiplier effects generate 35 private sector jobs during field development and 4 jobs annually during production.

These additional jobs will have a population impact, and the new population from this source will increase the demand for public services. We assume that the ratio of population to employment for calculating the population impact is the same as the population as a whole, and that the public service requirements of this new population is at a cost equal to the average for the entire population.

Using these assumptions we calculate that the 123 jobs associated with state service delivery (79 public and 44 private) during the development phase of the field generate a population increase of 229, which has its own public service requirement of \$1.1 million. The 13 jobs associated with state service delivery (8 public and 5 private) annually during production generate a population increase of 25, with a public service requirement of \$.12 million annually.

TABLE 8: MARGINAL FIELD ANALYSIS: STATE GOVERNMENT JOBS

	TOTAL DEVELOPMENT	ANNUAL PRODUCTION
STATE GOVERNMENT EXPENDITURES (MILLION \$) RELATED TO TABLE 6 POPULATION		
OPERATING	\$9.46	\$1.00
CAPITAL	\$1.83	\$0.19
DIRECT JOBS IN AK (MAN YEARS) (A)	90	10
STATE GOVERNMENT	79	8
CONSTRUCTION	11	1
JOBS HELD BY ALASKA RESIDENTS (B)	88	9
STATE GOVERNMENT	79	8
CONSTRUCTION	9	1
DIRECT PAYROLL IN ALASKA (MILLION \$) (C)	\$3.60	\$0.36
STATE GOVERNMENT	\$3.12	\$0.33
CONSTRUCTION	\$0.48	\$0.05
PAYROLL TO ALASKA RESIDENTS	\$3.53	\$0.37
STATE GOVERNMENT	\$3.12	\$0.33
CONSTRUCTION	\$0.41	\$0.04
ITEM: NON-RESIDENT PAYROLL SPENT IN AK (D)	\$0.01	\$0.00
INDIRECT AND INDUCED JOBS IN ALASKA (E)	35	4
TOTAL JOBS	125	14
TOTAL JOBS TO ALASKA RESIDENTS	123	13
INDIRECT & INDUCED PAYROLL (MILLION \$) (E)	\$0.78	\$0.08
TOTAL PAYROLL	\$4.38	\$0.46
TOTAL PAYROLL TO ALASKA RESIDENTS	\$4.31	\$0.46
POPULATION INDUCED BY THESE JOBS (F)	229	25
STATE EXPENDITURES REQUIRED FOR THIS POPULATION (G)	\$1.10	\$0.12
RELATED STATE EMPLOYMENT	9	1
(A) DIRECT EMPLOYMENT PER \$1 MILLION OF SPENDING	STATE OPERATIONS	8.33
	CONSTRUCTION	6
(B) RESIDENT SHARE OF EMPLOYMENT	STATE OPERATIONS	100%
	CONSTRUCTION	85%
(C) ANNUAL AVERAGE PAYROLL	STATE OPERATIONS	539.6
	NON REMOTE SITE CONSTRUCTION	544.0
(D) SHARE OF NON-RESIDENT PAYROLL SPENT IN ALASKA		20%
(E) FROM ALASKA INPUT-OUTPUT MODEL		
(F) POPULATION TO EMPLOYMENT RATIO	1.86	
SEE TABLE 9 NOTES		
(G) STATE EXPENDITURES PER CAPITA	\$4.800	
SEE TABLE 9 NOTES		
(H) EMPLOYMENT CALCULATED USING FACTOR FROM NOTE (A)		

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

ADDITIONAL MULTIPLIER EFFECTS: EMPLOYMENT, POPULATION, AND STATE GOVERNMENT COSTS (Table 9)

The method we have used to estimate the employment, population, and state government costs associated with marginal oil field development has captured most but not all of the effects. In this section we estimate the additional effects associated with three factors.

The first (Part A) recognizes the fact that the increase in state employment in response to oil field development and production population will itself produce a requirement for state employment because state government employees themselves are consumers of state government services. In fact, each round of employment generated by the economic multiplier produces an additional requirement for public services. The "third-round jobs" shown here are the public sector jobs necessary to provide services to the new population calculated in the previous table — 229 for development and 25 annually for production. Fourth- and subsequent-round jobs are those produced by the multiplier effect of these third-round jobs — most occurring in the private sector.

The second (Part B) recognizes the fact that the population increase will require additional local government activity. Since a large share of local government revenues come from state government transfers and the main local sources of local government revenues are the property and sales taxes, we have assumed that locally generated government revenues will increase proportional to the increase in population so that there will be no local deficit. There will be an employment effect, however.

We assume that the increase in local government activity is the same magnitude as the increase in state government employment. The "second-round" employment figures are similar to the state government employment figures from Table 8. Subsequent rounds reflect the multiplier effect of local government spending in the economy.

Finally, because of the economic multiplier, there is an "interaction effect" between state spending and local spending as the third effect (Part C). New state employees will require new local government services, and new local government employees will require new state government services. The "third-round" interactions effects are twice the third round from Part A.

The total of these effects is 175 additional jobs during development and 19 jobs annually during production added in the public and private sectors. This represents additional population of 327 and 35, respectively, and additional state expenditures of \$1.57 million during development and \$.017 million annually during production.

TABLE 9: MARGINAL FIELD ANALYSIS: ADDITIONAL JOBS & PUBLIC SPENDING

	TOTAL DEVELOPMENT	ANNUAL PRODUCTION
A. JOBS CREATED BY STATE PUBLIC SECTOR REQUIREMENTS OF NEW POPULATION GENERATED BY STATE SPENDING (TABLE 8)		
THIRD ROUND JOBS	9.17	1.00
FOURTH ROUND JOBS (A)	2.75	0.30
FIFTH ROUND JOBS	0.83	0.09
SIXTH ROUND JOBS	0.25	0.03
SEVENTH ROUND JOBS	0.07	0.01
TOTAL ADDITIONAL JOBS	13	1
TOTAL ADDITIONAL PAYROLL (B)	\$0.42	\$0.05
POPULATION (C)	24	3
STATE EXPENDITURES (D)	\$0.12	\$0.01
B. JOBS FROM THE PROVISION OF LOCAL GOVERNMENT SERVICES		
LOCAL GENERATED JOBS EQUAL TO TABLE 8	123.10	13.35
THIRD ROUND JOBS (SIMILAR TO PART A)	9.17	1.00
FOURTH ROUND JOBS	2.75	0.30
FIFTH ROUND JOBS	0.83	0.09
SIXTH ROUND JOBS	0.25	0.03
SEVENTH ROUND JOBS	0.07	0.01
TOTAL ADDITIONAL JOBS	136	15
TOTAL ADDITIONAL PAYROLL (B)	\$4.35	\$0.47
POPULATION (C)	254	28
STATE EXPENDITURES (D)	\$1.22	\$0.13
C. INTERACTION EFFECTS		
THIRD ROUND JOBS	18.35	1.99
FOURTH ROUND JOBS	5.50	0.60
FIFTH ROUND JOBS	1.65	0.18
SIXTH ROUND JOBS	0.50	0.05
SEVENTH ROUND JOBS	0.15	0.02
TOTAL ADDITIONAL JOBS	26	3
TOTAL ADDITIONAL PAYROLL (B)	\$0.83	\$0.09
POPULATION (C)	49	5
STATE EXPENDITURES (D)	\$0.23	\$0.03
SUM		
TOTAL ADDITIONAL JOBS	175	19
TOTAL ADDITIONAL PAYROLL	\$5.60	\$0.61
POPULATION	327	35
STATE EXPENDITURES	\$1.57	\$0.17
(A) ASSUME 0.3 ADDITIONAL JOBS CREATED IN EACH SUBSEQUENT ROUND OF THE MULTIPLIER EFFECT		
(B) AVERAGE ANNUAL PAYROLL (000\$) FROM ADOL	\$31.0	
(C) RATIO OF POPULATION TO EMPLOYMENT FROM TABLE 6	1.86	
(D) STATE EXPENDITURES PER CAPITA FROM ANALYSIS OF 1990 BUDGET--TABLE 12	\$4.800	

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

TOTAL EMPLOYMENT, POPULATION, AND PAYROLL IMPACTS (Table 10)

This table sums the employment, payroll, and population effects from earlier tables to produce the total economic effects of marginal field development and production.

Total resident employment attributable to the development of the marginal oil field from all sources is estimated to be 1,780. Of this total, 572 are directly associated with the establishment of the new field and represent jobs in the oil and construction sectors employed at the site; 201 jobs are associated with vendor sales to the oil and construction sectors. The remainder are elsewhere in the private and public sectors of the economy.

Total resident employment attributable to the annual production of the marginal oil field from all sources is estimated to be 190. Of this total, 60 are directly associated with on-site production. An additional 21 are associated with vendor sales to the oil sector. The remainder are elsewhere in the private and public sectors of the economy.

The total population increase from development is 3,319 and from annual production, 354. Since the development phase occurs over several years, the population increase in any year would be much less.

Total resident payroll is \$89 million for development and \$9.5 million annually for production. The average annual payroll is \$50 thousand, considerably above the average for all industries in the state.

TABLE 10: MARGINAL FIELD ANALYSIS: TOTAL JOBS IMPACT

	<u>TOTAL DEVELOPMENT</u>	<u>ANNUAL PRODUCTION</u>
OIL PATCH JOBS: TABLE 5		
DIRECT	572	60
VENDORS	201	21
INDIRECT AND INDUCED	709	76
TOTAL ALASKA RESIDENTS	1,482	157
NON-RESIDENTS	191	15
STATE SUPPORT OF OIL PATCH INDUCED POPULATION: TABLE 8		
STATE GOVERNMENT AND STATE FUNDED CONSTRUCTION	88	9
INDIRECT AND INDUCED	35	4
TOTAL ALASKA RESIDENTS	123	13
NON-RESIDENTS	2	0
OTHER JOBS: TABLE 9		
TOTAL ALASKA RESIDENTS	175	19
NON-RESIDENTS	0	0
TOTAL RESIDENT JOBS CREATED	1,780	190
NON-RESIDENTS	192	15
TOTAL POPULATION INCREASE	3,319	354
OIL PATCH JOBS	2,762	293
STATE SUPPORT	229	25
OTHER	327	35
TOTAL PAYROLL INCREASE (MILLION \$)	\$89.07	\$9.53
OIL PATCH JOBS	\$79.17	\$8.47
STATE SUPPORT	\$4.31	\$0.46
OTHER	\$5.60	\$0.61
AVERAGE PAYROLL (000\$)	\$50.03	\$50.26

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

POTENTIAL REVENUES FROM NEW PAYROLL TAX BASE (Table 11)

Alaska, unlike other states, has neither a statewide personal income tax nor a statewide sales tax for collecting a portion of the revenues required to pay for the state services provided to residents. The payroll generated by the marginal field development and production represents an increase in revenue-producing capacity for the state since it is an addition to the potential income and sales tax base.

In the average state, 4.8% of personal income is collected by the state in some combination of personal income tax and general sales tax. We can calculate the taxes which would be collected from the payroll generated by marginal oil development and production if this average tax rate were applied.

Potential tax collections during development would be \$4.87 million, of which \$.86 million would be from nonresidents. Potential tax collections annually during production would be \$.50 million, of which \$.06 million would be from nonresidents. Over the life of the field, the revenues from this source could be \$14.8 million.

TABLE 11: MARGINAL FIELD ANALYSIS: POTENTIAL REVENUES FROM NEW TAX

	TOTAL DEVELOPMENT	ANNUAL PRODUCTION	TOTAL PRODUCTION	SUM
TOTAL PAYROLL--TAX BASE--(MILLION \$)				
OIL RELATED EMPLOYMENT				
RESIDENT	\$79.17	\$8.47	\$169.40	\$248.56
NON-RESIDENT	\$19.06	\$1.51	\$30.15	\$49.22
PUBLIC EXPENDITURE RELATED				
RESIDENT	\$4.31	\$0.46	\$9.13	\$13.44
NON-RESIDENT	\$0.07	\$0.01	\$0.15	\$0.23
OTHER MULTIPLIER EFFECTS				
RESIDENT	\$5.60	\$0.61	\$12.15	\$17.75
NON-RESIDENT	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL				
RESIDENT	\$89.07	\$9.53	\$190.67	\$279.75
NON-RESIDENT	\$19.13	\$1.52	\$30.31	\$49.44
POTENTIAL REVENUES (MILLION \$)	\$4.87	\$0.50	\$9.94	\$14.81
PERSONAL INCOME TAX	\$2.38	\$0.24	\$4.86	\$7.24
RESIDENT	\$1.96	\$0.21	\$4.19	\$6.15
NON-RESIDENT	\$0.42	\$0.03	\$0.67	\$1.09
STATE SALES TAX	\$2.49	\$0.25	\$5.08	\$7.57
RESIDENT	\$2.05	\$0.22	\$4.39	\$6.43
NON-RESIDENT	\$0.44	\$0.03	\$0.70	\$1.14

FOR THE US AS A WHOLE STATE PERSONAL INCOME TAXES AND STATE
GENERAL SALES TAXES COMPRISE 4.5% OF PERSONAL INCOME
SOURCE: SIGNIFICANT FEATURES OF FISCAL FEDERALISM, ADVISORY
COMMISSION ON INTERGOVERNMENTAL RELATIONS, SEPTEMBER 1992,
PAGE 168.

PERSONAL INCOME TAX RATE 2.20%

STATE SALES TAX RATE 2.30%

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

SUMMARY: STATE GOVERNMENT REVENUES AND COSTS (Table 12)

The total costs associated with providing state services in support of the marginal oil field are \$51.11 million. Of this total \$7.4 million is the estimated cost of management by state government. The larger portion is the cost of providing services to the population induced by the activity. These costs are estimated at \$13.96 million during the development of the field and \$1.49 million each year during the 20-year life of the field. These figures for population-required services include not only the oil and construction industry workers and their families, at a cost of \$13.3 million, but all the population induced in all sectors of the economy.

Variation in this estimate would result from different assumptions about the cost to state government per person and the total population induced by the change in employment. The employment level itself is largely set by the choice of development and production plan for the field. We have been conservative in our assumptions about the additional cost of government services for additional population by assuming that most of the cost of government varies with the size of the population. Furthermore, we have assumed that all new employment will result in additional population. This results in a high estimate of the requirement for additional government services.

In spite of this conservatism, the revenues generated by the marginal oil field exceed the costs to state government in all cases except the low price, low royalty, and low production case when they are equal.

Of the five sources of revenues, the royalties, potential personal taxes, and "full pipeline effect" contribute most of the revenues. The corporate income tax and state-wide property tax make only a small contribution to revenues. Personal taxes are independent of the level of production or price of oil since they are determined by the employment generated by development and production. The "full pipeline effect" depends most importantly on the total production from the marginal field. The royalties are the most sensitive source of revenue, depending importantly on the level of production, the wellhead price, and the royalty rate.

For all but the lowest level of production, price, and royalty rate, there is a state revenue "dividend" calculated as the difference between revenues collected and revenues needed to pay for new costs of government. The size of the dividend reaches \$300 million using assumptions of high production, high wellhead price, and high royalty rate.

TABLE 12: MARGINAL FIELD ANALYSIS: SUMMARY PUBLIC REVENUES AND EXPENDITURES

	TOTAL DEVELOPMENT	ANNUAL PRODUCTION	TOTAL PRODUCTION	SUM	CUMULATIVE TOTAL
STATE EXPENDITURE REQUIREMENTS FROM MARGINAL FIELD (MILLION \$)					
RESOURCE MANAGEMENT 100 MILLION BARREL FIELD (A)			\$7.40	\$7.40	\$7.40
STATE SPENDING FOR NEW POPULATION					
OIL INDUSTRY	\$4.26	\$0.45	\$8.98	\$13.24	\$20.64
VENDORS	\$1.50	\$0.16	\$3.13	\$4.63	\$25.27
INDIRECT AND INDUCED RELATED TO OIL FIELD	\$5.53	\$0.59	\$11.85	\$17.38	\$42.65
RELATED TO PUBLIC SPENDING	\$2.67	\$0.29	\$5.79	\$8.47	\$51.11
TOTAL SPENDING FOR NEW POPULATION	\$13.96	\$1.49	\$20.78	\$43.71	
TOTAL STATE SPENDING					\$51.11
REVENUES PROVIDED (MILLION \$)					
STATE REVENUES FROM MARGINAL OIL PRODUCTION--ROYALTIES, INCOME & PROPERTY TAX					
RESERVES (MILLION BARRELS)	WELLHEAD	ROYALTY			
50	\$8.31	6%	\$1.47	\$29.40	\$29.40
100	\$8.31	6%	\$2.94	\$56.83	\$56.83
50	\$11.86	12%	\$3.78	\$75.60	\$75.60
150	\$8.31	6%	\$4.21	\$84.26	\$84.26
50	\$14.17	15%	\$5.54	\$110.76	\$110.76
100	\$11.86	12%	\$7.46	\$149.23	\$149.23
100	\$14.17	15%	\$10.98	\$219.55	\$219.55
150	\$11.86	12%	\$11.14	\$222.86	\$222.86
150	\$14.17	15%	\$16.42	\$326.35	\$326.35
STATE REVENUES FROM HIGHER WELLHEAD VALUE					
50			\$0.39	\$7.84	\$7.84
100			\$0.78	\$15.56	\$15.56
150			\$1.16	\$23.18	\$23.18
POTENTIAL REVENUES FROM INCOME AND SALES TAX	\$4.87	\$0.50	\$9.94	\$14.81	
TOTAL STATE REVENUES					
RESERVES (MILLION BARRELS)	WELLHEAD	ROYALTY			
50	\$8.31	6%	\$4.87	\$2.06	\$47.16
100	\$8.31	6%	\$4.87	\$4.12	\$82.33
50	\$11.86	12%	\$4.87	\$4.67	\$93.38
150	\$8.31	6%	\$4.87	\$5.87	\$117.38
50	\$14.17	15%	\$4.87	\$6.43	\$126.54
100	\$11.86	12%	\$4.87	\$8.74	\$174.74
100	\$14.17	15%	\$4.87	\$12.25	\$245.06
150	\$11.86	12%	\$4.87	\$12.80	\$255.99
150	\$14.17	15%	\$4.87	\$18.07	\$361.47
STATE REVENUE DIVIDEND--REVENUES MINUS EXPENDITURES					
RESERVES (MILLION BARRELS)	WELLHEAD	ROYALTY			
50	\$8.31	6%			\$0.84
100	\$8.31	6%			\$38.09
50	\$11.86	12%			\$47.14
150	\$8.31	6%			\$71.14
50	\$14.17	15%			\$82.30
100	\$11.86	12%			\$126.50
100	\$14.17	15%			\$198.82
150	\$11.86	12%			\$208.74
150	\$14.17	15%			\$315.23
(A) TOTAL EXPENDITURES FOR MANAGEMENT OF OIL AND GAS IN FY 1992					
			\$49.50 MILLION		
DEPT OF LAW			\$26.00		
NATURAL RESOURCES			\$7.90		
ENVIRONMENTAL CONSERVATION			\$5.70		
REVENUE			\$4.60		
FISH AND GAME			\$2.10		
GOVERNOR'S OFFICE			\$1.70		
LABOR & COMMUNITY AND REGIONAL AFFAIRS			\$0.70		
ANNUAL PRODUCTION (MILLION BARRELS)			689,045		
OIL AND GAS MANAGEMENT EXPENSE PER BARREL			\$0.07		
SOURCE: LEGISLATIVE RESEARCH AGENCY RESEARCH REQUEST 93-102 & ADOR SPRING 1995 REVENUE SOURCES					

MARGINAL OIL FIELD DEVELOPMENT: THE ECONOMIC IMPACT

STATE GOVERNMENT EXPENDITURE ANALYSIS (Table 13)

To estimate the per capita cost to state government of new population, we analyzed each item in the 1990 state operating budget and put each one into one of seven categories based on its characteristics. The first category is general expenditures serving the adult population of the state. The second category is the expenditures specifically to serve the educational needs of the school-aged population. The third is the services provided specifically to seniors (senior supplement). The fourth is expenditures specifically for the management of Alaska public resources. The fifth is for activities which are clearly not population sensitive such as operation and maintenance of the Governor's mansion. The sixth is the activities that are clearly targeting the rural population like the power cost equalization program. The seventh is those activities that are targeting the unemployed or underemployed such as job training programs.

The sum in each category was then divided by the population served to arrive at a per-client figure for the category of service. We assumed that the population under 5 required no public services independent of their parents. All adults require one unit of general adult services. In addition, some individuals require a supplement — for seniors, rural, or safety net.

The allocation to categories other than general adult was only done if it was clear that such an allocation was appropriate. Consequently, we have been conservative in estimating the cost of state government for an average adult, and a more detailed analysis would result in a lower figure since more programs would be moved into the special categories.

These figures are used in the analysis in Table 7.

TABLE 13: MARGINAL FIELD ANALYSIS: STATE PER CAPITA EXPENDITURES

	DISTRIBUTION OF ACTIVITIES							
	avg over pop	general adult 18+	school aged child	senior supplement	safety net supplement	rural supplement	resource management	pure public & misc
TOTAL \$	\$3,008,406	\$1,620,534	\$693,315	\$102,009	\$286,458	\$55,535	\$190,278	\$80,277
PERCENT OF TOTAL		53.87%	23.05%	3.39%	9.52%	1.85%	6.32%	2.00%
GENERAL FUND \$	\$2,192,101	\$1,133,320	\$618,402	\$92,799	\$141,070	\$38,520	\$126,980	\$41,010
PERCENT OF TOTAL		51.70%	28.21%	4.23%	6.44%	1.76%	5.79%	1.87%
TOTAL FTE EMPLOYMENT	18,131	15,042	146	545	545	62	1,621	171
PERCENT OF TOTAL		82.96%	0.80%	3.01%	3.00%	0.34%	8.94%	0.94%
POPULATION GROUP SERVE	553,600	380,609	118,008	22,459	55,360			
GENERAL FUND SPENDING PER PERSON SERVED (000\$)	\$3.96	\$2.98	\$5.24	\$4.13	\$2.55			

SOURCE: 1990 STATE OPERATING BUDGET ANALYSIS USING
STATE OF ALASKA BEARS SYSTEM.

**MARGINAL OIL FIELD DEVELOPMENT:
THE ECONOMIC IMPACT**

APPENDIX A. STATE GOVERNMENT PROGRAM ANALYSIS DETAIL

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$3 008 406	1 620 534	693 315	102 009	190 278	60 277	55 535	286 453
PERCENT OF TOTAL		53.87%	23.05%	3.39%	6.32%	2.00%	1.85%	9.52%
GENERAL FUND \$	\$2 192 101	\$1 133 320	\$618 402	\$92 799	\$126 980	\$41 010	\$38 520	\$141 070
PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	18 131	15 042	146	545	1 621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

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COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
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Office of the Governor

1	Commissions/Special Offices	Human Rights Commission		
3	Commissions/Special Offices	Equal Employment Opportunity		
5	Commissions/Special Offices	Alaska Womens Commission		
6	Executive Operations	Executive Office		
9	Executive Operations	Governor's House	1	5
10	Executive Operations	Contingency Fund		
11	Executive Operations	Lieutenant Governor		
13	Executive Operations	Office of International Trade		
797	Executive Operations	Arctic National Wildlife Refuge		
1173	Executive Operations	High Seas Salmon Interception	1	4
15	Office of Management & Budget	Policy		
16	Office of Management & Budget	Budget Review		
17	Office of Management & Budget	Division of Audit and Management Services		
18	Office of Management & Budget	Governmental Coordination		
21	Elective Operations	Elections		
22	Elective Operations	General and Primary Elections		
23	Elective Operations	Elections Data Processing		

Department of Administration

26	Longevity Bonus	Grants	1	3	
27	Longevity Bonus	Administration	1	3	
28	Pioneers Homes	Sitka	1	3	
29	Pioneers Homes	Fairbanks	1	3	
30	Pioneers Homes	Palmer	1	3	
31	Pioneers Homes	Anchorage	1	3	
32	Pioneers Homes	Ketchikan	1	3	
33	Pioneers Homes	Juneau	1	3	
34	Pioneers Homes	Central Office	1	3	
35	Pioneers Homes	Pioneers Homes Advisory Board	1	3	
36	Older Alaskans Commission	Older Alaskan Services	1	3	
38	Public Defender	First Judicial District	1		7
39	Public Defender	Second Judicial District	1		7
40	Public Defender	Third Judicial District	1		7
41	Public Defender	Fourth Judicial District	1		7
42	Public Defender	Administration and Support	1		7
43	Office of Public Advocacy	Office of Public Advocacy			
45	Office of the Commissioner	Office of the Commissioner			
46	Administrative Services	Administrative Services			
47	Administrative Services	Municipal Grants			
55	CIP Direct Charge Positions	CIP Direct Charge Positions			
56	Personnel	Personnel			
57	Personnel	Productivity Improvement Center			
58	Labor Relations	Labor Relations			
59	Finance	Finance			
60	General Services	Purchasing			
61	General Services	Property Management			
62	General Services	Central Duplicating and Mail			
64	Retirement and Benefits	Retirement and Benefits			
964	Retirement and Benefits	Elected Public Officers Retirement System Benefits			
66	Labor Relations Agency	Labor Relations Agency			
70	Alaska Public Offices Commission	Alaska Public Offices Commission			
71	Risk Management	Risk Management			
72	Information Services	Computer Services			
74	Information Services	Telecommunications Services			
75	Information Services	Rural Alaska Television Network	1		5
77	Public Broadcasting Commission	Public Broadcasting Commission	1		5
79	Leasing and Facilities	Administration			
81	Leasing and Facilities	Leases			
83	Retirement Incentive Program	Retirement Incentive Program			

Department of Law

84	Consumer Protection	Consumer Protection		
85	Prosecution	First Judicial District		
86	Prosecution	Second Judicial District		
87	Prosecution	Third Judicial District		
88	Prosecution	Fourth Judicial District		
89	Prosecution	Criminal Justice Litigation		
90	Prosecution	Criminal Appeals and Special Prosecution		
91	Prosecution	Data and Word Processing		

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$3,006,406	1,620,534	693,315	102,009	190,278	60,277	55,535	286,458
PERCENT OF TOTAL		53.87%	23.05%	3.39%	6.32%	2.00%	1.85%	9.52%
GENERAL FUND \$	\$2,192,101	\$1,133,320	\$618,402	\$92,799	\$126,980	\$41,010	\$38,520	\$141,070
PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	18,131	15,042	146	545	1,621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
93	Legal Services	Operations
94	Legal Services	Antitrust
95	Legal Services	Administration and Support
97	Oil and Gas Special Projects	Oil and Gas Operations
98	Oil and Gas Special Projects	Data and Word Processing
99	Oil and Gas Litigation	Oil and Gas Litigation
1175	Exxon Valdez Litigation	Exxon Valdez Litigation
Department of Revenue		
111	Child Support Enforcement	Child Support Enforcement
100	Alcohol Beverage Control Board	Alcohol Beverage Control Board
103	Shared Taxes	Amusement and Gaming Tax
104	Shared Taxes	Aviation Fuel Tax
105	Shared Taxes	Electric and Telephone Cooperative Tax
106	Shared Taxes	Liquor License Tax
107	Shared Taxes	Fisheries Tax
108	Municipal Bond Bank Authority	Municipal Bond Bank Authority
109	Permanent Fund Corporation	Permanent Fund Corporation
110	Alaska Housing Finance Corporation	Alaska Housing Finance Corporation
1009	Science and Technology	Science and Technology
113	Revenue Operations	Income and Excise Audit
115	Revenue Operations	Oil and Gas Audit
121	Revenue Operations	Treasury Management
123	Administration and Support	Commissioner's Office
982	Administration and Support	Oil and Gas Tax Case Review
125	Administration and Support	Administrative Services
981	Permanent Fund Dividend	Permanent Fund Dividend
Department of Education		
141	K-12 Support	Foundation Program
145	K-12 Support	Student Lunch Program
146	K-12 Support	Cigarette Tax Distribution
147	K-12 Support	Tuition Students
148	K-12 Support	Boarding Home Grants
150	K-12 Support	Youth in Detention
151	K-12 Support	Schools for the Handicapped
144	K-12 Support	Pupil Transportation
153	School Debt Reimbursement	School Debt Reimbursement
155	Ed Finance & Support Services	District Support Services
156	Ed Finance & Support Services	CIP Overhead and Associated Costs
159	Data Management & Processing	Data Processing
1018	Data Management & Processing	Data Management
165	Education Program Support	Community Schools
166	Education Program Support	Special and Supplemental Services
171	Education Program Support	Basic Education and Instructional Improvement
172	Education Program Support	Correspondence Study-State
173	Education Program Support	Education Special Projects
1029	Education Program Support	Instructional Technology Support
1033	Education Program Support	Director's Office
177	Adult and Vocational Education	Adult Basic Education
178	Adult and Vocational Education	Employment Training Grants
179	Adult and Vocational Education	Federal Vocational Education Grants
180	Adult and Vocational Education	Adult and Vocational Education Administration
181	Adult and Vocational Education	Alaska Career Information System
182	Adult and Vocational Education	Rural School Vocational Education Program
183	Adult and Vocational Education	Vocational Education Special Projects
184	Retirement Incentive Program (RI)	Retirement Incentive Program
189	Executive Administration	Executive Administration
157	Executive Administration	Department Administrative Services
158	Executive Administration	Department Overhead Expenses
190	Commissions and Boards	Professional Teaching Practice
192	Commissions and Boards	Alaska State Council on the Arts
195	Kotzebue Technical Center	Kotzebue Technical Center Operations Grant
196	Alaska Vocational Technical Center	Alaska Vocational Technical Center Operations
198	MI Edgecumbe Boarding School	Instruction Program
199	MI Edgecumbe Boarding School	Residential Program
976	MI Edgecumbe Boarding School	Private and Federal Grants
200	Vocational Rehabilitation	Counseling and Placement
975	Vocational Rehabilitation	Federal Training Grant
201	Vocational Rehabilitation	Services to Clients

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	53 008 406	1 620 534	693 315	102 009	190 278	60 277	55 535	286 458
PERCENT OF TOTAL		53 87%	23 05%	3 39%	6 32%	2 00%	1 85%	9 52%
GENERAL FUND \$	52 192 101	\$1 133 320	\$618 402	\$92 799	\$126 980	\$41 010	\$38 520	\$141 070
PERCENT OF TOTAL		51 70%	28 21%	4 23%	5 79%	1 87%	1 76%	6 44%
TOTAL FTE EMPLOYMENT	16 131	15 042	146	545	1 621	171	62	545
PERCENT OF TOTAL		82 96%	0 80%	3 01%	8 94%	0 94%	0 34%	3 00%

COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
202	Vocational Rehabilitation	Vocational Rehabilitation Administration
203	Vocational Rehabilitation	Independent Living Rehabilitation
204	Vocational Rehabilitation	Specialized Facilities
205	Vocational Rehabilitation	Services for the Blind and Deaf
206	Vocational Rehabilitation	Disability Determination
207	Vocational Rehabilitation	Supported Work
208	Alaska State Library	Library Operations
209	Alaska State Library	Blue Book
977	Alaska State Library	Archives
210	Alaska State Museums	Museum Operations
211	Alaska State Museums	Specific Cultural Programs
212	Alaska Postsecondary Education	Program Administration
213	Alaska Postsecondary Education	Student Loan Operations
214	Alaska Postsecondary Education	Western Interstate Commission For Higher Education
215	Alaska Postsecondary Education	Western Interstate Commission for Higher Education
953	Alaska Postsecondary Education	WAMI Medical Education
216	Student Financial Aid	Federal Student Aid
954	Alaska Postsecondary Education	Governor's Council on Vocational and Career Educat
217	Alaska Postsecondary Education	Data and Word Processing
218	Student Loan Corporation	Student Loan Program
Department of Health & Social Services		
220	Assistance Payments	Aid to Families with Dependent Children
222	Assistance Payments	Adult Public Assistance
221	Assistance Payments	General Relief Assistance
223	Assistance Payments	Old Age Assistance-Alaska Longevity Bonus (A
224	Assistance Payments	Post Mortem Examinations
225	Permanent Fund Dividend Hold H	Permanent Fund Dividend Hold Harmless
226	Energy Assistance Program	Energy Assistance Program
229	Medical Assistance	Medicaid Non-Facility
230	Medical Assistance	Medicaid-Facilities
960	Medical Assistance	Indian Health Service
966	Medical Assistance	Medicaid Permanent Fund Dividend Hold Harm
231	Medical Assistance	Alaska Longevity Bonus Hold Harmless
232	Medical Assistance	General Relief Medical
967	Medical Assistance	Medicaid State Programs
233	Public Assistance Administration	Public Assistance Administration
234	Public Assistance Administration	Quality Control
236	Public Assistance Administration	Eligibility Determination
237	Public Assistance Administration	Fraud Investigation
238	Public Assistance Administration	Alaska Work Programs
240	Public Assistance Administration	Public Assistance Data Processing
241	Medical Rate Commission	Medical Rate Commission
242	Medical Assistance Administratio	Medical Assistance Central Administration
243	Medical Assistance Administratio	Claims Processing
244	Medical Assistance Administratio	Medical Care Advisory Committee
245	Medical Assistance Administratio	Certification and Licensing
248	Purchased Services	Preventive Services
249	Purchased Services	Adult Services
250	Purchased Services	Early Intervention Services
252	Purchased Services	Foster Care
253	Purchased Services	Residential Child Care
254	Family Services	Southcentral Region
255	Family Services	Northern Region
256	Family Services	Northwestern Region
257	Family Services	Western Region
258	Family Services	Southeastern Region
259	Family Services	Central Office: Family and Youth Services
263	Social Services Block Grant Offse	Social Services Block Grant Offset
264	Youth Services	McLaughlin Youth Center
265	Youth Services	Fairbanks Youth Facility
266	Youth Services	Nome Youth Facility
267	Youth Services	Johnson Youth Center
268	Youth Services	Bethel Youth Facility
269	Youth Services	Probation Services
270	Manilaq	Manilaq Eligibility Determination and Staff Dev
271	Manilaq	Manilaq Social Services
272	Manilaq	Manilaq Public Health Services
273	Manilaq	Manilaq Alcohol and Drug Abuse Services
274	Manilaq	Manilaq Mental Health/Developmental Disabilit

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$3 008.406	1 620.534	693.315	102.009	190.278	60.277	55.535	286.458
PERCENT OF TOTAL		53.87%	23.05%	3.39%	6.32%	2.00%	1.85%	9.52%
GENERAL FUND \$	\$2 192.101	\$1 133.320	\$618.402	\$92.799	\$126.980	\$41.010	\$38.520	\$141.070
PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	18.131	15.042	1.46	545	1.621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

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COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
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275	Manilaq	Manilaq Senior Center	1	6
276	Norton Sound	Norton Sound Social Services	1	6
277	Norton Sound	Norton Sound Public Health Services	1	6
278	Norton Sound	Norton Sound Alcohol and Drug Abuse Service	1	6
279	Norton Sound	Norton Sound Mental Health and Development	1	6
280	Norton Sound	Norton Sound Sanitation	1	6
1004	Southeast Alaska Regional Health	Southeast Alaska Regional Health Corporation	1	6
1005	Southeast Alaska Regional Health	Southeast Alaska Regional Health Corporation	1	6
281	Kawerak Social Services	Kawerak Social Services	1	6
282	Tanana Chiefs Conference	Tanana Chiefs Conference Public Health Serv	1	6
283	Tanana Chiefs Conference	Tanana Chiefs Conference Alcohol and Drug A	1	6
284	Tanana Chiefs Conference	Tanana Chiefs Conference Mental Health Servi	1	6
285	Tlingit-Haida Social Services	Tlingit-Haida Social Services	1	6
286	Anchorage Social Services Block	Anchorage Social Services Block Grant		
287	Fairbanks Social Services Block	Fairbanks Social Services Block Grant		
978	Yukon-Kuskokwim Health Corpor	Yukon-Kuskokwim Public Health Services	1	6
979	Yukon-Kuskokwim Health Corp	Yukon-Kuskokwim Alcohol/Drug Services	1	6
980	Yukon-Kuskokwim Health Corpor	Yukon-Kuskokwim Mental Health Services	1	6
288	State Health Services	Nursing		
1013	State Health Services	Women, Infants and Children		
290	State Health Services	Maternal, Child, and Family Health		
291	State Health Services	Laboratory Services		
292	State Health Services	Public Health Administrative Services		
296	State Health Services	Epidemiology		
297	State Health Services	Emergency Medical Services (EMS) Training and Lice		
952	State Health Services	AIDS Services		
961	State Health Services	Bureau of Vital Statistics		
298	Health Grants	Infant Learning Program Grants		
299	Health Grants	Community Health Grants		
300	Health Grants	Emergency Medical Services Grants		
301	Health Grants	Health Promotion		
302	Alcohol and Drug Abuse Services	Administration		
303	Alcohol and Drug Abuse Services	Drug Abuse Grants		
304	Alcohol and Drug Abuse Services	Alcohol Abuse Grants		
305	Alcohol and Drug Abuse Services	Alcohol Safety Action Program (ASAP)		
307	Community Mental Health Grants	Community Mental Health Grants		
800	Community Mental Health Grants	Services to the Chronically Mentally Ill		
1014	Community Mental Health Grants	Designated Evaluation and Treatment		
309	Community Developmental Disab	Community Developmental Disabilities Grants		
310	Institutions and Administration	Mental Health Administration		
311	Institutions and Administration	Alaska Psychiatric Institute		
313	Institutions and Administration	Harborview Development Center		
316	Institutions and Administration	Alaska Youth Initiative		
317	Administrative Services	Commissioner's Office		
318	Administrative Services	Audit		
319	Administrative Services	Personnel and Payroll		
320	Administrative Services	Budget and Finance		
321	Administrative Services	Governor's Council/Handicapped and Gifted	1	5
322	Administrative Services	Data and Word Processing		
323	Administrative Services	Planning and Development		
325	Administrative Services	Facilities/CIP Costs		
1189	Administrative Services	Office of Prevention		
951	Administrative Services	Alaska Mental Health Board	1	5
326	Retirement Incentive Program	Retirement Incentive Program		

Department of Labor

328	Employment Security	Employment Services		
329	Employment Security	Unemployment Insurance		
331	Employment Security	Alaska Work Programs	1	7
332	Employment Security	Youth Employment Services	1	7
333	Employment Security	Governor's Committee on Employment of People With		
334	Data Processing	Data Processing		
335	Administrative Services	Management Services		
336	Administrative Services	Labor Market Information	1	7
337	Administrative Services	Resident Hire		
340	Office of the Commissioner	Commissioner's Office		
343	Fishermen's Fund	Fishermen's Fund	1	4
344	Workers' Compensation	Workers' Compensation		
345	Labor Standards and Safety	Wage and Hour Administration		
346	Labor Standards and Safety	Mechanical Inspection		

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
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TOTAL FTE EMPLOYMENT	16,131	15,042	146	545	1,621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

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COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
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970	Labor Standards and Safety	Occupational Safety and Health
1006	Labor Standards and Safety	Employment Preference Enforcement

Department of Commerce & Economic Development

349	Measurement Standards	Operations						
351	Banking, Securities, and Corporat	Financial Institutions						
352	Banking, Securities, and Corporat	Corporations						
354	Insurance	Operations						
356	Occupational Licensing	Administration						
357	Occupational Licensing	Licensing Boards						
358	Occupational Licensing	Investigations						
1027	Commissioner/Administrative Ser	Commissioner's Office						
1028	Commissioner/Administrative Ser	Administrative Services						
364	Alaska Public Utilities Commissio	Operations			4			
368	Oil and Gas Conservation Commi	Operations	1		4			
370	Alaska Energy Authority	Administration						
371	Alaska Energy Authority	Plant Operation and Maintenance						
372	Alaska Energy Authority	CIP Positions						
373	Alaska Energy Authority	Power Cost Equalization Administration	1					
965	Alaska Energy Authority	Power Cost Equalization Grants	1				6	6
801	Business Development	Business Development						
383	Investments	Investments						
387	Fisheries Enhancement Tax Rece	Fisheries Enhancement Tax Receipts	1		4			
1017	Tourism	Tourism Development	1		4			
1026	Tourism	Alaska Tourism Marketing Council	1		4			
390	Alaska Industrial Development an	Operations						
391	Alaska Industrial Development an	Capital Improvement Position Costs						
393	Alaska Seafood Marketing Institut	Alaska Seafood Marketing Institute	1		4			
1003	Alaska Housing Market Council	Alaska Housing Market Council	1				5	
1182	Amateur Sports Authority	Amateur Sports Authority						

Department of Military & Veterans Affairs

407	Disaster Planning & Control	Emergency Management Assistance						
408	Disaster Planning & Control	State Emergency Management Programs						
410	Disaster Planning & Control	Federal Emergency Management Programs						
413	Disaster Planning & Control	Federal Community Assistance						
414	Alaska National Guard	Office of Adjutant General	1				5	
415	Alaska National Guard	Army Guard Facilities Maintenance	1				5	
416	Alaska National Guard	Air Guard Facilities Maintenance	1				5	
836	Alaska National Guard	State Active Duty	1				5	
419	Alaska National Guard Benefits	Alaska National Guard Benefits	1				5	
962	Alaska National Guard Benefits	Retention Benefits Formula	1				5	
420	Alaska National Guard Benefits	Retirement Benefits	1				5	
421	Veterans' Affairs	Veterans' Services						
963	Veterans Affairs	Death Gratuity						
422	Disaster Relief Fund	Disaster Relief Fund						

Department of Natural Resources

423	Management and Administration	Commissioner's Office						
424	Management and Administration	Administrative Services						
42C	Management and Administration	Grants						
427	Management and Administration	Information Resource Management						
802	Management and Administration	Recorder's Office/Uniform Commercial Code						
429	Management and Administration	Data Processing/Direct Charge CIP						
430	Management and Administration	Commissions						
431	Land and Water Management	Land and Water Management	1			4		
433	Land and Water Management	Survey/Direct Charge CIP	1			4		
435	Forest Management	Forest Management	1			4		
439	Petroleum Management	Petroleum Management	1			4		
442	Mining Management	Mining Management/Operations	1			4		
1031	Geological Management	Geological Management	1			4		
437	Statewide Fire Suppression Progr	Fire Suppression	1			4		
451	Parks & Recreation Management	Historic Resource Management						
452	Parks & Recreation Management	Parks Management						
454	Parks & Recreation Management	Parks/Direct Charge/Overhead CIP						
455	Agricultural Management	Agricultural Management	1			4		
456	Agricultural Management	Agriculture/Direct Charge CIP	1			4		

Department of Fish & Game

459	Commercial Fisheries	Commercial Fisheries	1			4		
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1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$3,008,406	1,620,534	693,315	102,009	190,278	60,277	55,535	286,458
PERCENT OF TOTAL		53.87%	23.05%	3.39%	6.32%	2.00%	1.85%	9.52%
GENERAL FUND \$	\$2,192,101	\$1,133,320	\$618,402	\$92,799	\$126,980	\$41,010	\$38,520	\$141,070
PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	16,131	15,042	146	545	1,621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
461	Commercial Fisheries	Special Projects
464	Sport Fisheries	Sport Fisheries
465	Sport Fish	Special Projects
467	F R E D	F R E D
468	F R E D	Special Projects
473	Wildlife Conservation	Wildlife Conservation
474	Wildlife Conservation	Special Projects
475	Wildlife Conservation	Capital Improvement Position Costs
477	Administration and Support	Office of the Commissioner
478	Administration and Support	Public Communications
479	Administration and Support	Administrative Services
481	Retirement Incentive Program	Retirement Incentive Program
482	Boards of Fisheries and Game	Boards Services
483	Subsistence	Subsistence
484	Subsistence	Special Projects
486	Habitat	Habitat
487	Habitat	Special Projects
471	Commercial Fisheries Entry Com	Program Administration
Department of Public Safety		
490	Fish and Wildlife Protection	Enforcement and Investigative Services Unit
491	Fish and Wildlife Protection	Director's Office
492	Fish and Wildlife Protection	Aircraft Section
493	Fish and Wildlife Protection	Marine Enforcement
494	Fire Prevention	Fire Prevention Operations
496	Fire Prevention	Fire Service Training
498	Highway Safety Planning Agency	Highway Safety Planning Operations
827	Highway Safety Planning Agency	Commercial Vehicle Safety
499	Highway Safety Planning Agency	Federal Grants
500	Motor Vehicles	Driver Services
501	Motor Vehicles	Vehicle Services
502	Motor Vehicles	Field Services
503	Motor Vehicles	Administration
799	Alaska State Troopers	Detachments
1001	Alaska State Troopers	Special Projects
830	Alaska State Troopers	Criminal Investigations Bureau
508	Alaska State Troopers	Director's Office
831	Alaska State Troopers	Judicial Services-Anchorage
512	Alaska State Troopers	Prisoner Transportation
513	Alaska State Troopers	Search and Rescue
515	Alaska State Troopers	Rural Trooper Housing
798	Alaska State Troopers	Narcotics Task Force
516	Village Public Safety Officer Progr	Contracts
517	Village Public Safety Officer Progr	Support
518	Village Public Safety Officer Progr	Administration
519	Alaska Police Standards Council	Alaska Police Standards Council
520	Violent Crimes Compensation Bo	Violent Crimes Compensation Board
521	Domestic Violence and Sexual As	Domestic Violence and Sexual Assault
522	DPS Statewide Support	Contract Jails
523	DPS Statewide Support	Commissioners Office
524	DPS Statewide Support	Training Academy
525	DPS Statewide Support	Administrative Services
526	DPS Statewide Support	Civil Air Patrol
527	DPS Statewide Support	Laboratory Services
528	DPS Statewide Support	Alaska Public Safety Information Network
837	DPS Statewide Support	Building Security and Maintenance
Department of Transportation/Public Facilities		
530	Office of the Commissioner	Commissioner's Office
532	DBE/External Equal Employment	Disadvantaged Business Enterprise and External Equ
972	DBE/External Equal Employment	Unbudgeted RSA's (EEO Payroll Suspense)
534	Statewide Internal Review	Statewide Internal Review
536	Internal Review	Unbudgeted RSA's Audit P R Suspense
537	Statewide Administrative Services	Administrative Services
957	Statewide Administrative Services	Statewide Leasing/Property Management
539	Statewide Administrative Services	State Equipment Fleet
540	Statewide Information Systems	Statewide Information Systems
542	State Plans Programs and Budge	Plans Programs and Budget
545	State Plans Programs and Budge	Unbudgeted RSA's (HPR Payroll Suspense)
543	State Plans Programs and Budge	Statewide Aviation Planning

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$3,008,406	1,620,534	693,315	102,009	190,278	60,277	55,535	286,458
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PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	18,131	15,042	146	545	1,621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

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COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
1217	State Plans, Programs and Budget	Aviation Planning Payroll Suspense RSA
546	Statewide Research	Statewide Research
974	Statewide Research	Unbudgeted RSA's (HPR Payroll Suspense)
547	Statewide Engineering and Operations	Engineering and Operations Standards
1216	Statewide Engineering and Operations	Engineering & Operations Payroll Suspense RSA
549	Statewide Engineering and Operations	CIP Program
553	Central Region Administrative Services	Administrative Services
556	Central Region Administrative Services	Leasing and Property Management
557	Central Region Planning	Central Region Planning
560	Central Region Planning	Unbudgeted RSA's
561	Central Region Design and Construction	Engineering Management
1215	Central Region Design and Construction	Engineering Management Payroll Suspense RSA
563	Central Region Design and Construction	CIP Program
570	Northern Region Administrative Services	Interior District Administrative Services
571	Northern Region Administrative Services	Western District Administrative Services
572	Northern Region Administrative Services	Southcentral District Administrative Services
573	Northern Region Administrative Services	Data and Word Processing
577	Northern Region Administrative Services	Airport Leasing and Property Management
578	Northern Region Planning	Northern Region Planning
580	Northern Region Planning	Unbudgeted RSA'S, HPR P R SUS
581	Northern Region Design and Construction	Engineering Management
1218	Northern Region Design and Construction	Engineering Management Payroll Suspense RSA
583	Northern Region Design and Construction	CIP Program
594	Southeast Region Administrative Services	Southeast Region Administrative Services
597	Southeast Region Planning	Southeast Region Planning
973	Southeast Region Planning	Unbudgeted RSA's (Payroll Suspense)
599	Southeast Region Design and Construction	Engineering Management
1219	Southeast Region Design and Construction	Engineering Management Payroll Suspense RSA
601	Southeast Region Design and Construction	CIP Program
607	International Airports	Director of International Airports
608	Anchorage International Airport	Field Maintenance
609	Anchorage International Airport	Building Maintenance
610	Anchorage International Airport	Security
611	Anchorage International Airport	Custodial
612	Anchorage International Airport	Equipment Maintenance
613	Anchorage International Airport	Administration
614	Anchorage International Airport	Data and Word Processing
615	Fairbanks International Airport	Field Maintenance
616	Fairbanks International Airport	Building Maintenance
617	Fairbanks International Airport	Security
618	Fairbanks International Airport	Custodial
619	Fairbanks International Airport	Administration
564	Central Region Maintenance and Facilities	Highways and Aviation
565	Central Region Maintenance and Facilities	Traffic Signal Management
566	Central Region Maintenance and Facilities	Facilities
567	Central Region Maintenance and Facilities	Administration
554	Central Region Maintenance and Facilities	State Equipment Fleet
584	Interior District Maintenance and Facilities	Highways and Aviation
585	Interior District Maintenance and Facilities	Facilities
833	Interior District Maintenance and Facilities	Dillon Highway and Aviation
834	Interior District Maintenance and Facilities	Dillon Facilities
586	Interior District Maintenance and Facilities	Administration
574	Interior District Maintenance and Facilities	State Equipment Fleet
587	Western District Maintenance and Facilities	Highways and Aviation
588	Western District Maintenance and Facilities	Facilities
589	Western District Maintenance and Facilities	Administration
575	Western District Maintenance and Facilities	State Equipment Fleet
590	Southcentral District Maintenance and Facilities	Highways and Aviation
591	Southcentral District Maintenance and Facilities	Facilities
592	Southcentral District Maintenance and Facilities	Administration
576	Southcentral District Maintenance and Facilities	State Equipment Fleet
603	Southeast Region Maintenance and Facilities	Highways and Aviation
604	Southeast Region Maintenance and Facilities	Facilities
605	Southeast Region Maintenance and Facilities	Administration
596	Southeast Region Maintenance and Facilities	State Equipment Fleet
621	Marine Management	Administration
625	Marine Management	Customer Services Management
623	Marine Engineering	Engineering Management
624	Marine Engineering	CIP Program
629	Marine Operations	Vessel Operations Management

1990 ALASKA GENERAL FUND EXPENDITURES
SOURCE: STATE OF ALASKA BEARS SYSTEM

DISTRIBUTION OF ACTIVITIES

		general adult GF	child GF	senior GF	resource GF	pure public misc GF	rural GF	safety net GF
TOTAL \$	\$1 008 406	1 620 534	693 315	102 009	190 278	60 277	55 535	286 458
PERCENT OF TOTAL		53.87%	23.05%	3.39%	6.32%	2.00%	1.85%	9.52%
GENERAL FUND \$	\$2 192 101	\$1 133 320	\$618 402	\$92 799	\$126 980	\$41 010	\$38 520	\$141 070
PERCENT OF TOTAL		51.70%	28.21%	4.23%	5.79%	1.87%	1.76%	6.44%
TOTAL FTE EMPLOYMENT	18 131	15 042	146	545	1 621	171	62	545
PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

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COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
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626	Marine Operations	Southeast Shore Operations
630	Marine Operations	Southeast Vessel Operations
627	Marine Operations	Southwest Shore Operations
631	Marine Operations	Southwest Vessel Operations
632	Retirement Incentive Program	Retirement Incentive Program

Department of Environmental Conservation

633	Administration	Office of the Commissioner
635	Administration	Administrative Services
637	Facility Construction and Operatio	Facility Construction and Operations
638	Facility Construction and Operatio	Village Safe Water and Construction Grants Program
639	Environmental Quality	Environmental Quality Director
643	Environmental Quality	Monitoring and Laboratory Support
1016	Environmental Quality	Environmental Quality Projects
646	Environmental Health	Environmental Health Director
647	Environmental Health	Animal Health and Dairy Industry
648	Environmental Health	Meat and Poultry Inspection
649	Environmental Health	Seafood Industry
650	Environmental Health	Sanitation
651	Environmental Health	Palmer Laboratory

Department of Community & Regional Affairs

683	Administration and Support	Office of the Commissioner
684	Administration and Support	Administrative Services
686	Administration and Support	Data and Word Processing
671	Administration and Support	Designated Grants
653	Senior Citizens/Disabled Veteran	Homeowners' Property Tax Exemption
654	Senior Citizens/Disabled Veteran	Renters' Equivalency Rebate
666	Community Assistance Grants	National Forest Receipts
668	Community Assistance Grants	Organizational Grants
689	Municipal Revenue Sharing	State Revenue Sharing
690	Municipal Revenue Sharing	Municipal Assistance
672	Local Government Assistance	Training and Development
673	Local Government Assistance	State Assessor
674	Local Government Assistance	Local Boundary Commission
676	Local Government Assistance	Statewide Assistance
680	Local Government Assistance	ANCSA Plan of Survey
681	Local Government Assistance	Municipal Lands Trustee
658	Child Assistance	Child Care
659	Child Assistance	Head Start Grants
660	Employment Training/Rural Devel	Training/Energy Field Offices
661	Employment Training/Rural Devel	Youth Programs
662	Employment Training/Rural Devel	Governor's Training Program
663	Employment Training/Rural Devel	Worker Adjustment Assistance
1012	Employment Training/Rural Devel	State Employment and Training
1178	Statewide Service Delivery	Statewide Service Delivery
677	Energy Programs	Energy Conservation
678	Energy Programs	Weatherization CIP
682	Community Development	Block Grants CIP
667	Community Development	Rural Development Grants
687	Housing Assistance	Housing Loan Administration
688	Housing Assistance	Housing Construction Development

Department of Corrections

694	Administration and Support	Commissioner's Office
695	Administration and Support	Parole Board
696	Administration and Support	Facility Capital Improvement Unit
697	Administration and Support	Administrative Services
698	Administration and Support	Data and Word Processing
700	Statewide Operations	Statewide Programs
1015	Statewide Operations	Classification and Transportation
701	Statewide Operations	Correctional Industries Administration
702	Statewide Operations	Correctional Industries Product Cost
703	Statewide Operations	Training Unit
704	Statewide Operations	Out-of-State Contractual
705	Statewide Operations	Major Medical
706	Statewide Operations	Northern Director's Office
707	Statewide Operations	Fairbanks Correctional Center
708	Statewide Operations	Anvil Mountain Correctional Center
709	Statewide Operations	Yukon-Kuskokwim Correctional Center

1990 ALASKA GENERAL FUND EXPENDITURES
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PERCENT OF TOTAL		82.96%	0.80%	3.01%	8.94%	0.94%	0.34%	3.00%

COMPONENT SERIAL NUMBER	BRU NAME	COMPONENT NAME
710	Statewide Operations	Northern Region Probation
711	Statewide Operations	Southcentral Director's Office
712	Statewide Operations	Palmer Correctional Center
713	Statewide Operations	Matanuska-Susitna Correctional Center
714	Statewide Operations	Combined Hilland Mountain Correctional Center
716	Statewide Operations	Cook Inlet Correctional Center
718	Statewide Operations	Anchorage Annex Correctional Center
720	Statewide Operations	Wildwood Correctional Center
722	Statewide Operations	Spring Creek Correctional Center
723	Statewide Operations	Southcentral Region Probation
724	Statewide Operations	Southeast Director's Office
725	Statewide Operations	Lemon Creek Correctional Center
726	Statewide Operations	Ketchikan Correctional Center
727	Statewide Operations	Southeast Region Probation
University of Alaska		
730	Statewide Programs and Services	Statewide Services
734	Statewide Programs and Services	Statewide Networks
732	Statewide Programs and Services	Statewide CIP Overhead Positions and Costs
1002	Statewide Vocational Technical P	Statewide Vocational Technical Programs
753	University of Alaska Anchorage	UAA/Anchorage Campus
756	University of Alaska Anchorage	UAA/Kenai College
757	University of Alaska Anchorage	UAA/Kodiak College
758	University of Alaska Anchorage	UAA/Matanuska-Susitna College
759	University of Alaska Anchorage	Prince William Sound Community College
761	University of Alaska Anchorage	UAA/Alaska Center For International Business
794	University of Alaska Anchorage	UAA/Organized Research
821	University of Alaska Anchorage	UAA/Mining and Petroleum Training Service
741	University of Alaska Fairbanks	UAF/Fairbanks Campus
956	University of Alaska Fairbanks	UAF/Rural College
751	University of Alaska Fairbanks	School of Fisheries and Ocean Science
750	University of Alaska Fairbanks	Fairbanks Organized Research
745	University of Alaska Fairbanks	UAF/Cooperative Extension Service
744	University of Alaska Fairbanks	UAF/Rural College/Chukchi Campus
746	University of Alaska Fairbanks	UAF/Rural College/Kuskokwim Campus
747	University of Alaska Fairbanks	UAF/Rural College/Northwest Campus
762	University of Alaska Southeast	UAS/Juneau Campus
764	University of Alaska Southeast	UAS/Sitka Campus
765	University of Alaska Southeast	UAS/Ketchikan Campus
Alaska Court System		
767	Alaska Court System	Appellate Courts
768	Alaska Court System	Trial Courts
769	Alaska Court System	Administration and Support
770	Commission on Judicial Conduct	Commission on Judicial Conduct
771	Judicial Council	Judicial Council
Legislature		
773	Budget and Audit Committee	Legislative Audit
774	Budget and Audit Committee	Legislative Finance
775	Budget and Audit Committee	Committee Expenses
776	Legislative Council	Salaries and Allowances
778	Legislative Council	Executive Administration
779	Legislative Council	Public Services
780	Legislative Council	Administrative Services
781	Legislative Council	Legal Services
782	Legislative Council	Session Expenses
783	Legislative Council	Council and Subcommittees
784	Legislative Council	Office Space Rental
1174	Legislative Council	Legislative Research Agency
796	Legislative Operating Budget	Legislative Operating Budget
790	Ombudsman	Ombudsman
Debt Service & Misc Programs		
792	Debt Service	General Obligation
793	Debt Service	International Airports
950	Debt Service	State Lease-Purchase Facilities

ARCO Alaska, Inc
Testimony
Re: HB-325

Mr. Chairman, for the record, my name is George Findling. I am the Manager of Government Relations for ARCO Alaska, Incorporated. I have resided in Alaska for over 11 years.

Thank you for the opportunity to testify HB-325. To summarize, while the provisions of HB-235 would create significant value in a West Sak development effort and while there is real merit for Alaska to incentivize heavy oil development, we can not say at this time that the provisions of HB-325 will create enough value to move the West Sak accumulation from unattractive to attractive for development. Let me elaborate with a background on ARCO's view for removing disincentives and our development status for West Sak, the heavy oil accumulation which lies above the Kuparuk horizon.

You may recall that last year ARCO testified that modifications to unrealized state revenues from oil should be used to stimulate investment and development that is not otherwise competitive under current conditions. As an another guideline, we also have strongly believed that because of the impending fiscal crisis, the rules for current revenue sources should not be changed: we believe that existing revenue sources should not be impacted. As a slight caveat, we have seen the benefits of tax credits for exploration drilling in other oil provinces and could see value in similar, modest programs in Alaska even though they would draw upon currently available general funds.

Turning back to heavy oil developments, such as West Sak, royalty is the primary potential state revenue stream which can be used to stimulate investment. This is because: 1) severance tax receipts will be essentially zero because of low well rates; 2) there are few, new, additional facilities which will increase ad valorem tax base; and 3) state income tax is not levied at the field level.

ARCO is working to bring West Sak oil into production. In the mid-1980's, our field work demonstrated a technique that could be used to complete wells and produce oil at modest rates. Despite these advances, the West Sak accumulation is currently not competitive for investment dollars when compared to other world wide opportunities. Numerous, closely spaced wells and lack of facility capacity make capital costs relatively high.

Low well rates, high operating costs and uncertain overall recovery rates raise the ongoing cost structure of the bulk of West Sak to unacceptably high levels.

Since the West Sak reservoir quality, indicated mainly by seam thickness, varies over the field, we would expect to develop first in the best areas, then move to the lesser areas of reservoir quality. In this scenario, you can imagine that production slowly builds up over time as the field development expands to new areas and cost reduction techniques are refined. Now, remember, the "best" West Sak is not as good in terms of current cost structure as the "worst" Kuparuk. So one key to West Sak is to make its cost structure effective enough to compete for facility usage against Kuparuk and other resources.

ARCO is trying to find ways to reduce this cost structure and make a significant amount of West Sak competitive. We are currently doing a strategic and technical "rethink" which we hope will lead to new, and innovative development approaches. In essence, we hope that a limited field program in 1996 and 1997 will be the first step in a phased commercialization which will include incremental improvements in technology and operating costs. The details of a program are not yet developed, but I can say that we will be trying to find ways to reduce our cost structure substantially at each step so that development can proceed to the next step.

Our current view is that we need to work through at least the 1996 cost reduction program to specifically know when royalty modifications will be needed to make the then next phase of development attractive for investment.

Our generic analyses to date show that royalty reductions can provide major improvements in the economics of a marginal heavy oil field. However, again, these improvements are making a negative situation only look less negative.

To summarize, whether some type of royalty reduction is sufficient to make the then next phase of the West Sak field attractive for investment is problematic at this time; but it will likely be better quantified after our 1996 cost reduction program.

Mr. Chairman, thank you for the opportunity to testify and I would be happy to take your questions.

***An Opportunity to Develop
Alaska's Heavy Oil Resources...***

**BP Exploration (Alaska) Inc.
OXY USA Inc.**

January 22, 1996

An Opportunity to Develop Alaska's Heavy Oil Resources...

I. Summary

Underlying the Milne Point and Kuparuk River units on Alaska's North Slope is a series of shallow, heavy oil sands that form the largest proven, undeveloped oil field in the United States. If development of those sands were economic, a billion or more barrels of oil could be recovered.

Beneath the Milne Point Unit alone, in the Schrader Bluff Formation, there are about 300 million barrels of recoverable heavy oil.^{1/} Initial development of that resource would entail drilling some 230 wells over a nine-year, labor-intensive development period, with peak production reaching at least 45,000 barrels per day. According to the University of Alaska, that activity would spawn:

- ◇ Capital development expenditures of \$550 million, of which 61%, or about \$333 million, would be spent in Alaska;

^{1/} See Bidinger and Dillon, *Milne Point Schrader Bluff: Finding the Keys to Two Billion Barrels*, SPE 30289 (available through BP Exploration (Alaska) Inc.). The Schrader Bluff sands, in relation both to other heavy oil sands at Milne Point and the West Sak Sands at the Kuparuk River Unit, are depicted in Chart 1.

Shallow Oil Sands Nomenclature

AGE	TYPE LOG MILNE POINT UNIT	TERMINOLOGY		
		Informal Milne Point Unit	Informal Kuparuk Unit	Formal North Slope GPI FORMATION
TERTIARY		K Sands	UPPER	SAGAVAN- IRKTOK
		L Sands	UGNU SANDS	
		M Sands	LOWER	PRINCE CREEK
		N Sands		SCHRADER BLUFF
CRETACEOUS		O Sands	WEST SAK SANDS	

Chart 1

- ◇ *Production expenditures of \$601 million spread over a 41-year field life, of which 85%, or about \$511 million, would be spent in Alaska;*
- ◇ *Around 360 new high-paying jobs during the development phase, and 134 new high-paying jobs during the 41-year production phase. 75-80% of those jobs would be filled by Alaska residents, resulting in additional Alaska resident payroll of \$171 million throughout the development phase, and \$7.4 million annually during the production phase; and*
- ◇ *65 new public sector jobs created during the development stage as a result of this increased economic activity, and 25 new public sector jobs created during the 41-year production phase.*^{2/}

And that, UAA projects, would flow solely from initial development of Schrader Bluff alone. All tolled, there are nearly 26 billion barrels of heavy oil underlying existing North Slope units--making ANS heavy oil a resource comparable to Prudhoe Bay. Successful initial development of Schrader Bluff could well result in technology transfers to other heavy oil lessees, and development of additional heavy oil deposits on the North Slope.

For the time being, however, and save for some minimal production from a Schrader Bluff pilot project, Alaska's heavy oil resources aren't being developed. Heavy oil is a thick and uncooperative substance, and its production poses a challenge to industry and governments worldwide.^{3/} For its part, Alaska's oil industry has

^{2/} University of Alaska Anchorage, School of Public Affairs and Institute of Social and Economic Research, *"Heavy Oil Development: The Economic Impact,"* December, 1995.

^{3/} Because heavy oil fields are "less attractive," Arthur D. Little recently told the Governor's Oil & Gas Policy Council, "changes in [government] fiscal terms may be necessary." Arthur D. Little/John Gault, *"Review of International Competitiveness of Alaska's Fiscal System,"* Preliminary Report for the State of Alaska, Department of Revenue, September, 1995 (*"Little Report"*) at 138. Guatemala, for example, imposes a lower royalty on heavier oil, according to a sliding scale based on the oil's viscosity. Ecuador does the same thing. *Id.* at 139-40. The U.S.

invested nearly \$270 million in the past decade tackling the technical barriers to lifting heavy oil from the cold, unconsolidated sands of the North Slope.

From an engineer's viewpoint, that pioneer effort succeeded. Complex and innovative completion technology was developed that can pull heavy oil from those sands at a sustained rate. But from an investor's eye, the pilot projects remain unconvincing. Initial flow rates from Schrader Bluff heavy oil wells have averaged only 275 barrels per day--far below the economic margin in this hostile working environment. ^{4/}

As a result, additional Schrader Bluff development is not expected to yield the minimal rate of return necessary to justify the requisite capital investment. Indeed, over the past several years, and through the Spring of 1995, the state itself has largely written the resource off--at least for the foreseeable future. The Alaska Department of Natural Resources' March, 1995 oil production forecasts, for example, concluded that Milne Point would produce no more heavy oil over the next 20 years than that currently lifted from the unit's small pilot project. ^{5/}

Department of Interior, Bureau of Land Management, has also proposed reduced royalties for heavy oil production, again on a sliding scale basis. 60 *Federal Register* 18081 (April 10, 1995).

^{4/} By comparison, initial production rates from individual Prudhoe Bay wells reached 25,000 bbls./day. Even initial production of lighter oil from Milne Point's Kuparuk formation--which observers uniformly acknowledge to be at the ANS margin--averaged 862 bbl./day.

^{5/} DNR, *Historical and Projected Oil and Gas Consumption*, March, 1995 at 6-7. The same conclusion was reached in the Spring, 1995 Department of Revenue ("DOR") forecasts. DOR, *Revenue Sources Book*, Spring, 1995 at Table 24 (base case).

The Fall, 1995 DOR forecasts use a different approach for predicting future revenues from undeveloped ANS resources. Those Fall, 1995 forecasts include considerably more near-term production from a variety of speculative projects such as North Star, Schrader Bluff, Mikkelson Bay and Colville River Delta than did the Spring, 1995 DOR projections, although even here Schrader Bluff production isn't projected to peak, at 45,000 bbls./day, until 2005. *Revenue Sources*, Fall, 1995, Table 22. The forecasts' Schrader Bluff figures begin with the unit's business plan projections for Schrader Bluff development discussed in Section III(A), *post*, then risk-discount those projections by about 25%. (cont'd)

That discouraging forecast, however, needn't necessarily be, and this paper proposes a special royalty structure for new ANS heavy oil development that may materially change project economics. The proposal was developed in response to the invitation extended to Alaska's private sector by Governor Knowles and his Oil & Gas Policy Council to explore new partnerships to guide Alaska's economy into the 21st century.

The proposal, embodied in HB 325, would suspend royalties for the first five years of production from any new ANS heavy oil well drilled after June 30, 1996. When the suspension ended, royalties would return to the full lease rate.^{6/} The suspension would apply only to the first 500 bbls./day of production from each well.

The Fall forecasts' methodology reflects the assumption that some development from various problematic ANS resources will likely occur, and that by spreading that *regional* prognosis over several prospects on a risk-discounted basis, the forecasts can paint a rough picture of plausible future production from the region as a whole without staking that projection on the fate of any one particular field. *Id.*, see p. 19. Indeed, the forecasts do not purport to conclude that development of any single marginal prospect will or will not be economic.

Inclusion of Schrader Bluff in that mix of regional possibilities is encouraging, since it seemingly reflects a growing recognition that, with an improved economic environment, ANS heavy oil is a potentially developable resource. That recognition, in part, may be attributable to the considerable attention that heavy oil received in the Summer of 1995, both before the Oil & Gas Policy Council and the legislature.

On the other hand, nothing occurred between the Spring and Fall of 1995 to warrant an about-face in the state's longstanding belief that, *under the fiscal status quo*, ANS heavy oil development will likely not happen in the foreseeable future. No technological or production breakthroughs occurred between the Spring and Fall forecasts, and the Fall, 1995 DOR projections' "long range price forecast is almost identical to last spring's." *Revenue Sources*, Fall, 1995, cover letter at 1.

For all these reasons, the Fall, 1995 DOR forecasts shouldn't be viewed as heralding any reversal in the state's outlook for Schrader Bluff development in the absence of some change in the fiscal environment.

^{6/} At Milne Point, for example, BP Exploration (Alaska) Inc., which owns 91.19% of Milne Point, would pay 12.5% on production assigned to some leases, and 20% on production assigned to others. OXY USA Inc., which owns the remaining 8.81% of the unit, would pay 12.5% on its share of production.

Any partnership should benefit each partner equally, and this proposal was tailored to accomplish that goal. For example:

From the state's perspective:

- ◇ *Given the unusually long life of heavy oil fields--in Schrader Bluff's case, an estimated 41 years--the state benefits more from incentives granted only for a finite period at the outset of production, rather than from more gradual incentives granted over the life of the field;*
- ◇ *The cost of administering the incentive is negligible;*
- ◇ *Suspensions have proven to be an effective tool in other oil producing jurisdictions to spur development of marginal fields. The state would be treading on proven ground;*
- ◇ *Only new heavy oil wells would benefit from the incentive, and for years now the state has assumed that no new heavy oil development will occur in the foreseeable future. As a result, the revenues contemplated by the state's various royalty agreements would be unimpaired;*
- ◇ *The short period of the incentive minimizes the state's exposure to unanticipated oil price increases or technological breakthroughs that might make heavy oil development more profitable. The state's window of exposure would be five years for each well, rather than over a 41-year field life; and*
- ◇ *By fashioning a specific incentive targeted to a single important resource, the state needn't re-invent overall state royalty policy or risk unintended consequences elsewhere.*

Conversely, from the investor's perspective:

- ◇ *The incentive is targeted at the initial years of production, and is therefore especially effective in allowing recovery of the lessee's capital investment in a reasonable period of time;*
- ◇ *The incentive would be available immediately;*
- ◇ *Because the incentive is granted by operation of law, its availability is certain, and serious investment decisions can be made in reliance on it; and*

- ◇ *Available economic and technical information suggests that this incentive will, in fact, materially improve the attractiveness of investing in ANS heavy oil development.*

Alaska's heavy oil reserves are an important public asset, and there are no risk-free options for managing it. One possibility, of course, is to wait things out, hoping for some unexpected, sustained oil price increase, or some technological advance, that would make heavy oil development attractive without any incentives. However:

- ◇ *As Arthur D. Little recently warned the Oil & Gas Policy Council, a "wait and see" strategy runs its own risks, since at some point the Trans Alaska Pipeline will no longer be available at a reasonable per-barrel tariff, if at all;*
- ◇ *In the case of ANS heavy oil, that risk is compounded by the fact that, even with incentives, heavy oil development may be economic only because it can share an existing infrastructure at Milne Point and Kuparuk River. In this respect, DNR's February, 1994 production forecasts predicted that Milne Point would be abandoned in 2006, while that agency's 1995 projections pegged the unit's abandonment date at 2011; ^{7/} and*
- ◇ *History has proven that progress in tackling the challenge of ANS heavy oil development is very much a child of momentum. Discouraging results have, time and again, led to years of inactivity as interest inevitably turns to more cooperative resources. See Section II(D), post. Putting ANS heavy oil on the public back burner may leave it there far longer than decision-makers intended.*

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^{7/} DNR, *Historical and Projected Oil and Gas Consumption*, February, 1994 at 6-7; March, 1995 at 6-7.

It's time to make a decision about Alaska's heavy oil. Even if the ultimate choice is to wait and see, the debate initiated by Governor Knowles will at least assure that the decision is purposeful.

The issue raised by this paper is how to optimize the public's return on a significant asset. It is not about trading jobs for royalties. As this paper will explain, and as Chart 2 illustrates, the underlying

Two Paths for Schrader Bluff

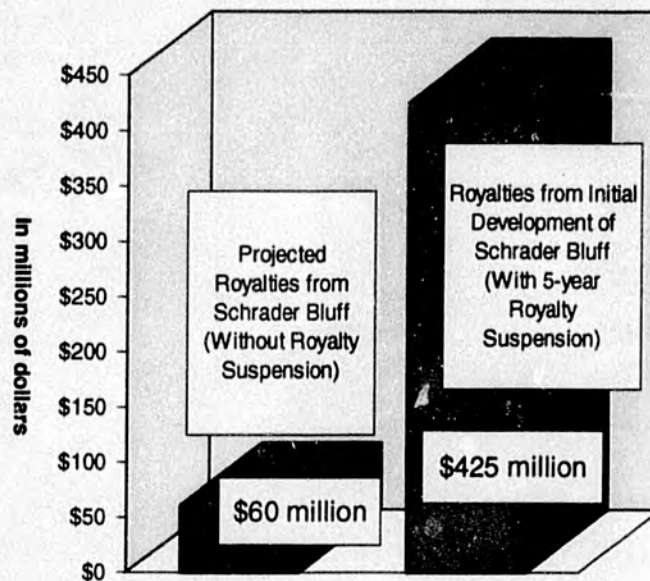


Chart 2. ^{8/}

premise of this proposal is that the state will receive more royalties from heavy oil development by adopting the incentive than by maintaining the *status quo*. Indeed, if the state's policy-makers conclude otherwise, there is little sense doing what this paper proposes.

^{8/} Source: Applicable royalty rates were applied to: (1) DNR's Spring, 1995 production forecasts for Schrader Bluff, discussed *ante*; then to (2) lessee projections of likely future production from initial Schrader Bluff development. Projected oil prices were taken from the Alaska Department of Revenue's Spring, 1995 *Revenue Sources Book's* base case. Dollars expressed are nominal.

Every management option available to the state carries its own mix of risk and potential reward. We believe that a careful balancing of those options will lead decision-makers to look carefully at the kind of tailored incentive contained in HB 325.

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II. Background: Milne Point and Heavy Oil

A. An Overview of the Milne Point Unit.

The Milne Point Unit lies 12 miles west of Prudhoe Bay. *Chart 3.*

The unit was developed in the 1980's by Conoco Inc., Chevron and OXY USA Inc. ("OXY"). In late

1993, Conoco and Chevron sold their interest in the unit to BP Exploration (Alaska) Inc. ("BP"), and today 91.19% of the unit is owned by BP, and the remaining 8.81% by

Production Formations at Milne Point

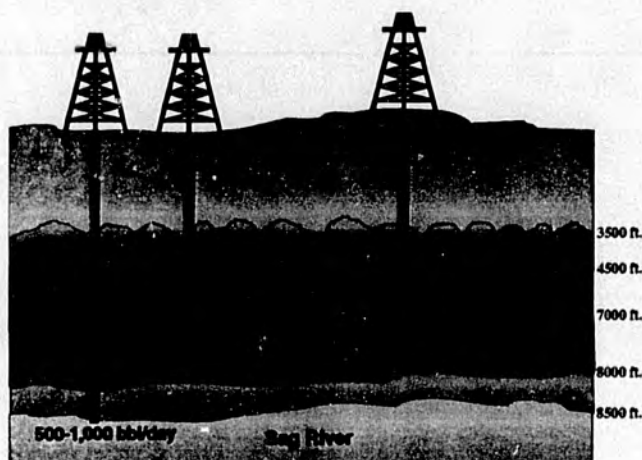
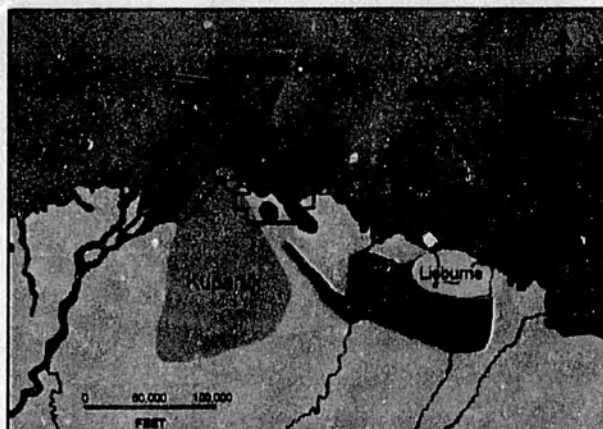


Chart 4

With an American Petroleum Institute ("API") gravity of 22-24 degrees, Kuparuk oil's quality is slightly heavier than other principal ANS crudes;



North Slope Fields and Milne Unit Outline

Chart 3

OXY.

Milne Point produces 28,000 barrels of oil daily from three formations (*Chart 4*):

Kuparuk (24,000 bbl./day).

Kuparuk production has been the unit's mainstay since production commenced in November, 1985.

Sag River (500-1000 bbls./day). In 1995, an initial long, horizontal well was drilled into this deepest of Milne Point formations. The well has produced only 500-1000 bbl./day because of the extraordinary amount of water produced from the formation. The API gravity of Sag River oil is about 35 degrees; and

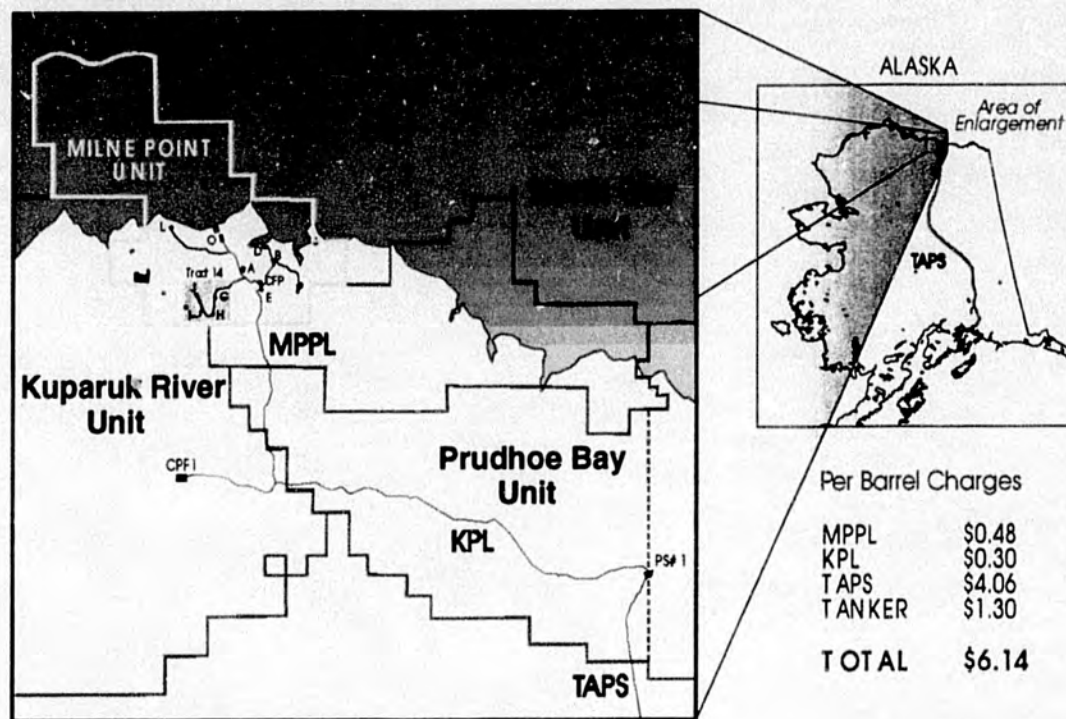
Schrader Bluff (3,000 bbl./day). Current production from this formation's heavy oil reserves comes from a pilot project initiated in 1990. The API gravity of Schrader Bluff oil ranges from 14-20 degrees. The companies' efforts to overcome the roadblocks to development of this resource are discussed in subsection (D), *post*.

B. The Unit's Economic Setting.

In-and-of itself, development of Schrader Bluff's heavy oil is a marginal proposition. Compounding the challenge is the fact that the unit from which that oil would be produced has been plagued by economic difficulties since its inception, including:

- Ø *Low Production Rates.* When Prudhoe Bay began production, its wells yielded up to 25,000 bbls./day. Initial rates from Milne Point's most productive formation--the Kuparuk--averaged only 862 bbl./day, and daily well production has declined at an annual rate of 15-20% ever since. Milne Point, in fact, has the lowest per well production rates of any major unit on the North Slope;
- Ø *High Royalties.* Because of a special royalty surcharge imposed on eight Milne Point leases at the time of unit formation (see Appendix A), BP pays a 20% royalty on its 91.19% interest in those eight leases. Virtually all other ANS production, including OXY's share of Milne Point production, is subject to a 12.5% royalty;
- Ø *High Transportation Costs.* As Chart 5 illustrates, Milne Point oil must travel through three pipelines to reach tidewater at Valdez, and resultantly pays the highest

Getting Heavy Oil to Market is Expensive



A-96
Chart 5

transportation costs on the North Slope. BP shares in those pipelines revenues; however, and except for an 8.81% interest in the Milne Point pipeline, OXY does not. Any income that OXY earns from its North Slope endeavors must come from Milne Point wellhead revenues; and

*Ø **Production Challenges.** Even Kuparuk Formation production has required costly waterflooding from the outset of production.*

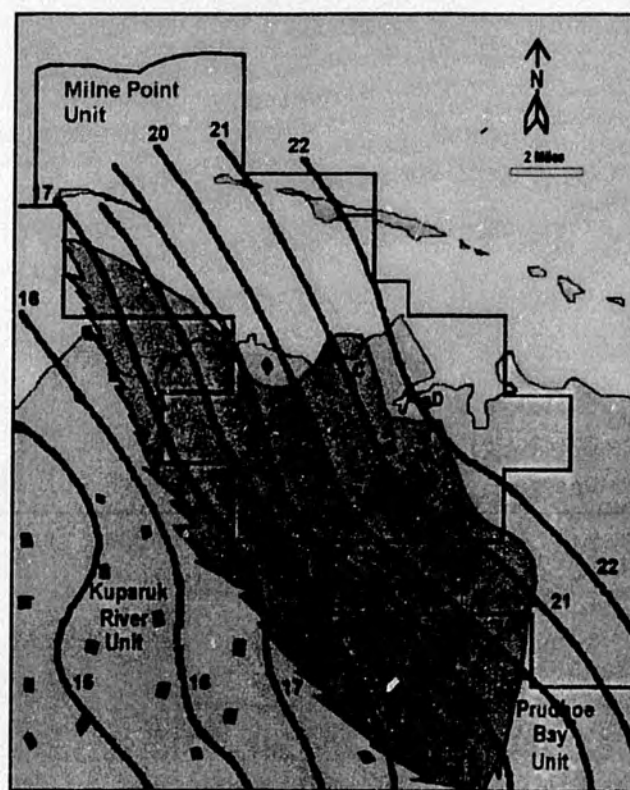
It is within this economic environment that BP and OXY have faced the challenge of developing the unit's heavy oil resources.

C. The Difficulties of Producing Heavy Oil.

The thickness, or viscosity, of crude oil is related to its gravity--the lower the gravity number, the heavier and thicker the oil. Outside of Milne Point, Alaska's currently-produced crudes range from 22-30 degrees at Prudhoe Bay to 25-35 degrees at Cook Inlet.

"Heavy oil" is generally defined as crude oil with an API gravity of 20 degrees or less.⁹ / As Chart 6 shows, the North Slope's heavy oil resources range from less than 14 degrees in the Kuparuk River Unit to 20 degrees in the southeast corner of the Milne Point Unit.

Thick as it is, heavy oil stubbornly resists lifting, and both downhole stimulation and mechanical lifting techniques are invariably needed to bring the oil to the surface. Compounding the problem on the North Slope is



SCHRADER BLUFF
O Sand
API Gravities

Chart 6

⁹/ For example, the Internal Revenue Code allows companies to claim a favorable percentage depletion allowance for "heavy oil" production, which the code defines to include oil with an API gravity of 20 degrees or less. 26 U.S.C. §613A(c)(6)(F). And, the U.S. Department of Interior, Bureau of Land Management, employs a 20-degree threshold for its pending heavy oil royalty relief proposal. 60 *Federal Register* 31663 (June 16, 1995).

reservoir temperature. At depths of 5000 feet or less, the cold Arctic subsurface chills the oil to impractically low temperatures.

Moreover, in Schrader Bluff's case the heavy oil is entrained in unconsolidated sand. As the oil is lifted, sand comes with it, choking the well bore and fouling the well pump.

Heavy oil's specific gravity is close to water's; as a result, oil/water separation becomes especially difficult. Once separated, moreover, heavy oil's viscosity, and its relative paucity of more valuable lighter hydrocarbon fractions, makes heavy oil less valuable in the market.

Heavy oil wells are notoriously slow producers. And though heavy oil fields enjoy correspondingly long field lives, slow initial production rates considerably impair the investor's ability to recover its capital investment in a commercially reasonable time.

Schrader Bluff's heavy oil is thus triply disadvantaged: (1) it shares the unpleasant attributes of heavy oil generally; (2) the reservoir's shallow depth and unconsolidated sand impose yet additional engineering challenges; and (3) its development suffers all the economic handicaps facing Milne Point as a whole.

Even so, Alaska's North Slope lessees have invested hundreds of millions of dollars trying to make a go of this uncooperative resource.

D. Industry's Efforts to Develop ANS Heavy Oil.

The initial stab at ANS heavy oil came not at Milne Point, but rather at the adjacent Kuparuk River Unit, which is operated by Arco Alaska Inc. ("Arco"). The prize at Kuparuk River is potentially even greater than Milne Point's. While Schrader Bluff

might produce 300 million barrels of heavy oil, Kuparuk River's West Sak Sands could eventually produce two or more times that amount.

Beginning in September, 1984, Arco invested \$135 million drilling 13 wells into the West Sak Sands, and building associated facilities, before abandoning that pilot project in December, 1986. About 1 million barrels were ultimately produced from that endeavor, which meant that the project's development costs were about \$135/bbl.

It took industry five years to try again, this time at Schrader Bluff. At Milne Point's Tract 14, Conoco, Chevron and OXY invested about \$126 million on 22 heavy oil wells and associated facilities.^{10/} The project's expected recovery of at least 13.5 million barrels translates into a 15-fold improvement in per barrel investment costs over Arco's West Sak effort--from \$135/bbl. to \$9.30/bbl.

The Tract 14 pilot was an exercise in ingenuity. To keep sand from the wellbore, the companies installed special gravel filters. To heat the oil as it rose through the permafrost zone, heat trace elements were wrapped to the production tubing. The reservoir was fractured to stimulate production, and an electric submersible pump was added downhole to lift the oil. *Chart 7.*

^{10/} Conoco, Chevron and OXY brought considerable expertise to bear on the 1991 pilot project. OXY, in particular, has long been a leader in developing innovative lifting techniques for heavy oil, particularly in California, where OXY owns heavy oil properties.

Even so, development costs of \$9.30/bbl. still made the exercise uneconomic, and initial flow rates from Tract 14 wells only averaged 275

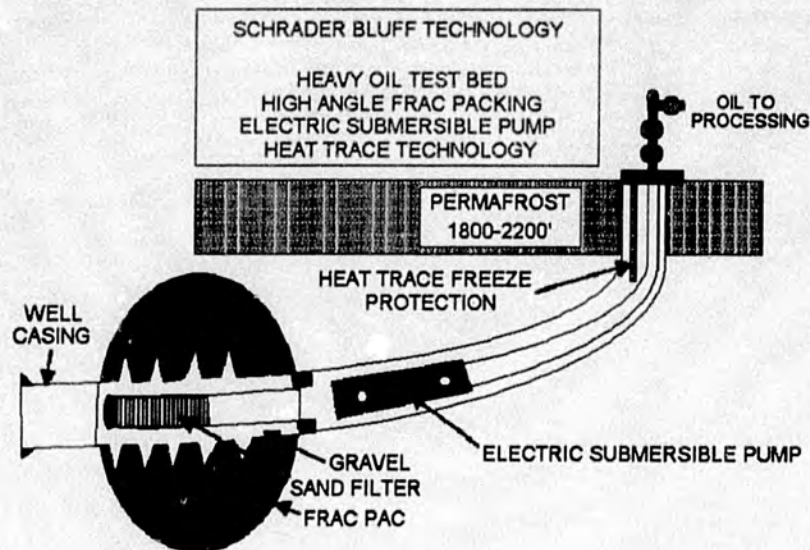


Chart 7

bbls./day. And so, at the end of 1991, further development of Schrader Bluff stopped.

It resumed again in 1994 with BP's acquisition of majority ownership in the unit. One heavy oil well was drilled in 1994, and, in 1995, BP and OXY invested \$15 million in six new wells, some well recompletions and additional technical study.

While evaluation of the 1995 drilling isn't complete, we do know that:

- Ø *Advances in technology and better geologic information have made initial flow rates of 300-400 bbls./day practical; and*
- Ø *Other, more conventional methods of stimulating heavy oil production are impractical. Conoco began water injection into Schrader Bluff wells in 1992, without proven success to date. Horizontal drilling, which improves lifting, has been tried at Schrader Bluff with mixed results. Steamflooding, a common recovery technique in the Lower 48, isn't feasible on the North Slope for environmental and practical reasons.*

Experience thus suggests that any dramatic technological breakthrough that would greatly improve ANS heavy oil well productivity is unlikely in the foreseeable future. Put simply, engineering, while it has brought full development of Schrader Bluff

near the brink, may also have reached the point of diminishing returns. What happens from here is largely an economic question.

And it's a question worth pursuing, given the considerable benefit, to both the public and private sectors, of realizing the fullest possible return on heavy oil development.

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III. The Consequences of Schrader Bluff Development

Ultimately, BP and OXY expect to recover at least 13.5 million barrels of heavy oil from the Tract 14 pilot project. Conversely, underlying Milne Point are about 300 million barrels of reasonably recoverable heavy oil. As one might expect, development of that resource would resonate throughout Alaska's economy.

A. The Parameters of Development.

DNR's Spring, 1995 production forecasts for Milne Point portray a unit peaking at 65,000 bbl./day in 1999, then sharply declining until the unit is abandoned in 2011.^{11/} As Chart 8 illustrates, with development of Schrader Bluff's heavy oil, the unit's profile looks different.^{12/}

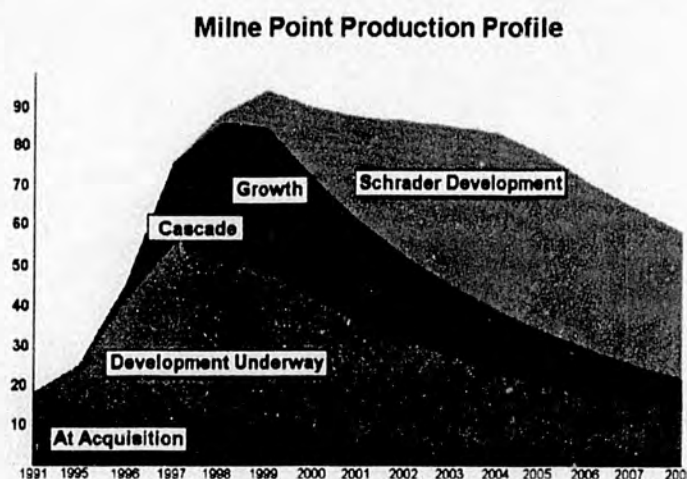


Chart 8

^{11/} *Historical and Projected Oil and Gas Consumption*, March, 1995 at 6-7.

^{12/} The components of Milne Point production depicted in the chart include: (1) "At Acquisition." This component reflects Milne Point production existing when BP acquired majority ownership of the unit at the end of 1993; (2) "Development Underway" is principally comprised of additional Kuparuk formation production from the northwest corner of the unit; (3) "Cascade" refers to an accumulation lying to the southeast of the unit. Production from that lease will be routed through Milne Point's processing facilities; (4) "Growth" refers to a number of planned expansion projects; and (5) "Schrader Development," of course, refers to the unit's heavy oil resources. Without Schrader Bluff development, the companies project peak production in 1998-99 of about 80,000 bbls./day--a forecast more optimistic than DNR's projections. Milne Point's central processing facilities are being expanded to accommodate that increased production. Currently, the unit produces only 28,000 bbl./day--a limit dictated in part by the current capacity of the unit's processing facilities. On the other hand, the companies' forecasts do mirror DNR's projections of a sharp decline in unit production after 1999, absent development of Schrader Bluff.

If and when the project becomes commercially feasible, the Milne Point Unit business plan envisions that initial development of Schrader Bluff would involve drilling some 230 wells, and constructing new surface facilities and pads, over a nine-year development period, with a total capital cost of \$550 million. Once producing, those wells would peak at 45,000 bbls./day, and production would decline only gradually, giving the field a 41-year life.

Over the 41-year period, production expenses would average \$15 million annually, totalling \$600 million over the field's life.

B. The Economic Impacts of Schrader Bluff Development.

1. Private Sector Employment

The University of Alaska Anchorage has authored an economic impact analysis of the initial development scenario in the Milne Point business plan. ^{13/} Employing the impact methodology developed by Professor Scott Goldsmith, the analysis charted both the direct and indirect employment and fiscal consequences of Schrader Bluff development. Looking first at the development phase of the project, those impacts included:

- Ø 233 direct oil industry jobs created during the nine-year development phase. ^{14/} Of those jobs, 157 would be performed in Alaska, and 118 would be filled by Alaska residents;*
- Ø 142 indirect or spin-off Alaska private sector jobs, and an additional 62 jobs for Alaska industry vendors, created during the development phase alone;*

^{13/} The analysis, entitled "Heavy Oil Development: The Economic Impact," is available on request from either UAA or BP.

^{14/} For the development phase, the UAA report expresses its projections in "man-years of employment" for the entire nine year development phase. To translate that number into "jobs," the total man-years (in the case of direct industry jobs, 2098 man-years) was divided by nine.

Ø *All tolled, 322 new private sector jobs filled by Alaska residents during the development phase, out of a total of 361 new private sector jobs performed in Alaska; and*

Ø *An Alaska resident payroll of \$171 million during the development phase, out of a total Alaska payroll of \$206.5 million.^{15/} Because Milne Point is a remote location, and because the jobs created by Schrader Bluff development are skilled, the average salary for each new direct oil industry job would be \$100,000/yr.*

Because the core infrastructure is already in place at Milne Point, the impacts of development-related employment would begin to be felt within months of the companies' commitment to the endeavor. Potentially, if that commitment is made early enough in 1996, the resultant jobs and payroll during the development phase would fuel the Alaska economy from 1996 through 2004.

Enhanced production would then commence in 1997. From that year, and until the year 2037, the UAA analysis projects that, throughout the period, Alaska would experience:

Ø *58 new long-term direct oil industry jobs in Alaska, of which 46 would be held by Alaska residents;*

Ø *An additional 76 new indirect and vendor jobs created in Alaska;*

Ø *All tolled, 134 new private sector jobs created in Alaska, of which 122 would be held by Alaska residents; and*

Ø *A total Alaska resident, private sector payroll increase of \$7.43 million/year, out of a total Alaska private sector payroll increase of \$8.58 million/year.*

^{15/} All dollar figures expressed in the UAA report are in constant 1995 dollars.

The private sector employment impacts forecast in the UAA report are summarized in Chart 9.

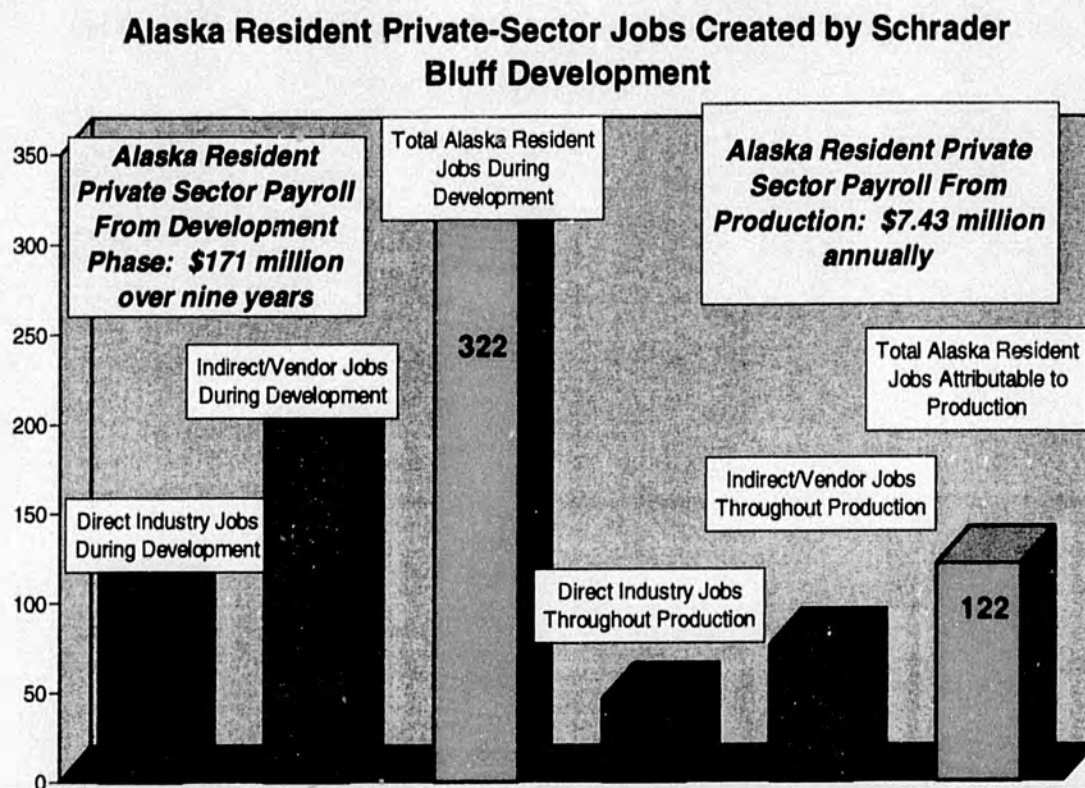


Chart 9

2. State Revenue Impacts

As Chart 2 indicates, the state can expect to receive \$365 million more in royalties than DNR's Spring, 1995 production forecasts would yield--*if* the passage of HB 325 stimulates development of Schrader Bluff.^{16/} For its part, and as Chart 10 illustrates, UAA looked at the aggregate of royalty and tax revenues that the state could expect to receive from initial Schrader Bluff development. UAA projects that the state would receive \$444 million in revenues, and a \$348 million net return (after accounting

^{16/} Again, the \$365 million figure is expressed in nominal dollars.

for increased government expenditures occasioned by the substantial increase in private sector employment), as a result of initial field development.^{17/}

One element of that net gain warrants special attention. Schrader Bluff development would cause a proportional increase in TAPS pipeline throughput occasioned by up to 45,000 bbl./day of



Chart 10

Schrader Bluff heavy oil travelling through it. Declining ANS production in the 21st century will cause upward pressure on per-barrel TAPS tariffs. As more Schrader Bluff oil passes through the TAPS line, the tariff on *all* ANS crude decreases, and the resultant wellhead value on *all* ANS crude increases.

That, in turn, results in higher state royalties on *all* ANS production. UAA estimates, in this regard, that if Schrader Bluff were developed, the state would earn between \$65-\$84 million in additional royalty income from *all* ANS production during Schrader Bluff's field life.

3. Public Sector Employment

UAA projects that the economic activity generated by Schrader Bluff development will occasion \$97 million in public sector costs over the life of the field. To a large extent, that translates into new public sector jobs.

^{17/} If TAPS pipeline throughput were lower than that scenario envisions, UAA's revenue and net revenue projections are, respectively, \$425 million and \$329 million.

UAA estimates that development will directly result in 27 additional state government jobs during the development phase, and an additional 10 state jobs lasting over the field's 41-year producing life. UAA also believes that second and subsequent rounds of public sector employment gains will be realized as the economic impact of the enterprise compounds itself. UAA concluded that 38 additional new public sector jobs--state and local--would be spawned by this multiplier effect during field development, while 15 additional new public sector jobs would be generated by the multiplier effect throughout 41 years of field production.

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IV. The Economics of Schrader Bluff Development.

A. The Rate of Return Necessary for Schrader Bluff Development.

\$550 million--the capital necessary to develop Schrader Bluff--is a considerable investment. And as Arthur D. Little recently reminded the Oil & Gas Policy Council, "[c]ompanies will review and compare all opportunities available to them worldwide, [and] governments are competing on a global basis to attract risk investment."^{18/}

The benchmark by which the attractiveness of Schrader Bluff investment will be measured is the "hurdle rate," which represents the minimal projected rate of return necessary to warrant consideration among the companies' investment options. That rate, in turn, is built on four components (Chart 11):

"Hurdle Rate" -- The Minimum Rate of Return Necessary to Justify Capital Investment

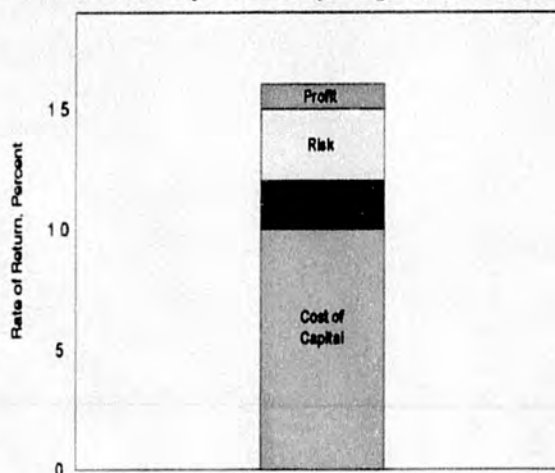


Chart 11

- Ø *The cost of capital.* Corporations acquire investment funds in one of two ways--borrowing, or attracting equity investment. The cost of capital is the weighted average of the company's bond interest rates and cost of equity;^{19/}
- Ø *Overhead.* Any new investment must bear its requisite share of the corporation's overall overhead costs, such as corporate management;

^{18/} Little Report at 9.

^{19/} Marino, *Handbook of Capital Expenditure Management* at 93 (1986). The cost of equity capital includes more than just dividends paid. The cost of capital for common stock, for example, consists of "the expected total return from dividend yield *and capital gains*." Block and Hirt, *Foundations of Financial Management*, App. 11A (1989); emphasis added.

Ø *Risk.* "[I]n order for investors to take more risk they must be compensated by larger expected returns...U.S. Treasury bills may be considered a riskless asset. When viewed in this context, an investor must achieve an extra return above that obtainable from a Treasury bill in order to induce the assumption of more risk." ;^{20/} and

Ø *Profit.* No enterprise invests without the expectation of some profit.

In today's market, and as Chart 11 suggests, these four "hurdle rate" components combine to require at least a 15% projected rate of return from any new investment--a benchmark validated by the *Little Report*:

Companies will generally consider any field uneconomic if the gross project value is negative at a discount rate of about 15%.

...
[Oil] companies generally look for a rate of return of about 15%...Projects with lower returns usually do not generate enough profits to encourage companies to commit time and resources to their development.

Little Report at 120, 122.

Passing the hurdle rate does not guarantee investment capital because, as Arthur D. Little reminded us, any investment must still compete with often lucrative worldwide opportunities. The hurdle rate is a qualifying time, not a checkered flag--it is only enough to warrant the prospect's consideration by corporate policy-makers.

The hurdle rate is therefore a conservative measure of Schrader Bluff's prospects, and also a conservative measure of the effectiveness of any development incentive.

^{20/} *Foundations of Financial Management*, op. cit. n. 19; see also *In the Matter of the Filing of Revised Tariffs by Cook Inlet Pipeline Co.*, Alaska Public Utilities Commission, January 14, 1985 at 26 (additional rate of return allowed because of risk that oil prices may drop in the future).

B. Schrader Bluff's Projected Rate of Return.

To forecast the likely rate of return from Schrader Bluff development, OXY seems the fairest candidate since, unlike other North Slope producers, OXY's revenues from Schrader Bluff production will come solely from wellhead revenues--OXY does not share in significant downstream pipeline, tanker or refinery profits.

For its presentation to the Oil & Gas Policy Council in June, 1995, OXY projected its rate of return from something of a best case. For example, initial flow rates from the Tract 14 pilot project have averaged only 275 bbls./day. The five best of those 21 wells managed initial rates of between 300-600 bbls./day, and OXY's projections assumed initial flow rates equal to the average of *only those five best producing wells*.

In other words, OXY assumed that the technological innovation and better geologic data gained through five years of experimentation at Schrader Bluff would yield the highest plausible reward.

To those production forecasts were applied:

- Ø *Projected oil prices drawn from the Department of Revenue's Spring, 1995 base case revenue forecasts;^{21/}*
- Ø *Well costs equal to the average costs of Tract 14's 21 wells;*
- Ø *The existing 12.5% state royalty, and historically-based tax payments;*
- Ø *Projected operating expenses taken from the unit's 1995 estimates; and*
- Ø *Facilities costs from the operator's 1995-1997 business plan.*

^{21/} As noted previously, the Fall, 1995 Department of Revenue long-range price forecasts are virtually identical to the Spring, 1995 forecasts. See n. 5, *ante*.

The results are depicted in Chart 12. In short, the projections show a:

- Ø **12.8% projected rate of return.** The projection thus falls materially short of the 15% hurdle rate;

Typical Heavy Oil Well Economics

Based on the 5 best wells to date in Tract 14

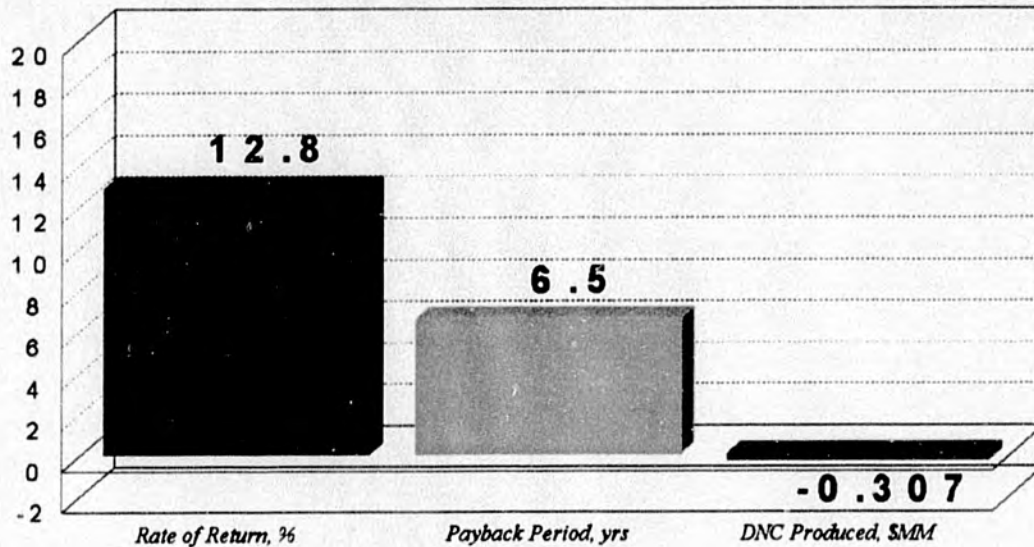


Chart 12

- Ø **6.5-year payout period.** Five years is a commercially reasonable time for project payout. The extended payout period is a function, of course, of the inadequate rate of return; and
- Ø **Negative discounted cash flow at 15%.** As Arthur D. Little observed, "[c]ompanies will generally consider any field uneconomic if the gross project value is negative at a discount rate of about 15%."

The numbers shouldn't be surprising. As we've seen, the state itself has long felt that development of Schrader Bluff is unlikely. And, despite:

- ⇒ Arco's investment of \$135 million in the Kuparuk River Unit's West Sak sands;

⇒ Conoco's and OXY's investment of \$126 million in the Tract 14 pilot project; and

⇒ BP's investment of an additional \$15 million in pilot drilling, recompletions and technical studies in 1995,

the only heavy oil produced today on the North Slope flows from those limited experimental endeavors. Schrader Bluff heavy oil sits beneath a convenient unit infrastructure. And, as Chart 8 illustrates, full Schrader Bluff development is integral to prolonging the entire unit's economic life. There seems, in sum, no good reason for not developing that field, save for its inability to cross the hurdle rate threshold.

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V. Legislation to Improve the Economics of Developing Alaska's Heavy Oil Resource

A. The Criteria for Legislation.

Development of Alaska's heavy oil resource is a shared challenge. For its part, the private sector has invested nearly \$270 million over the past decade in a determined effort to increase production and reduce production costs.

For its part, the state will affect heavy oil investment decisions most directly through the royalty structure that it imposes. In tailoring that structure to optimize the public's return on heavy oil development, there are seven criteria that should shape the outcome:

- Ø *Specificity.* As Section II(C)-(D) discussed, ANS heavy oil development presents unique challenges that are best met by a royalty structure tailored to the peculiarities of the resource. Revisiting general state royalty policy in order to spur heavy oil development may yield a result that is overbroad or insufficient, or which risks unintended consequences elsewhere.

For example, last year the legislature rewrote Alaska's general policy on oil and gas royalty relief. Ch. 85, SLA 1995; HB 207. From a statewide perspective, the legislation set a positive tone for encouraging public/industry partnerships in developing Alaska's marginal reserves. However, the heavy oil initiative that may best suit development of that resource--a five-year royalty suspension--would be impossible under that legislation. HB 207 requires a minimum 5% royalty for every year of production from new fields,²² / and a new field is eligible for relief only if there has been no commercial production from that field.²³ /

Both of these limitations may make considerable sense generally. However, with respect to heavy oil especially, the

²²/ AS 38.05.180(j)(4)(A).

²³/ AS 38.05.180(j)(1)(A)(ii). As we have seen, about 3,000 bbls./day of heavy oil are produced and sold from Schrader Bluff's Tract 14 pilot project.

minimum royalty requirement of HB 207 fails to account for the fact that heavy oil wells invariably: (1) have low initial production rates; but (2) produce for an unusually long time. Thus, the state may--and in this case apparently will--benefit more from a royalty structure that assesses 12.5%-20% royalties commencing in the sixth year of production, than from a structure that imposes, say, a 5% royalty throughout field life. See Section V(C)(6-7), post. ^{24/}

- Ø *Relevancy.* The task here is to materially improve the projected rate of return from the considerable capital investment necessary to develop ANS heavy oil reserves. Some royalty initiatives are aimed at lowering operating costs in order to prolong or renew production from declining wells. ^{25/} Here, the targets are quite different: (1) improving the return on new investment; and (2) reducing the period for recovering that investment to a commercially reasonable one.
- Ø *Certainty.* Companies are unlikely to make serious investment decisions on the mere possibility of a favorable royalty structure. A royalty structure established by operation of law, rather than one dependent on the uncertain outcome of an administrative proceeding, is considerably more likely to favorably influence investment choices.
- Ø *Immediacy.* There is a window of opportunity for development of ANS heavy oil reserves--one that will last only so long as: (1) the current infrastructure at Milne Point and Kuparuk River remains operational; and (2) the TAPS line is able to carry heavy oil at reasonable per-barrel tariffs.

DNR has projected, as recently as March, 1995, that Milne Point will be abandoned in 2011. That does not mean, however, that Alaska has 15 years to debate heavy oil. For example, integral to the ultimate economic viability of heavy oil development is the assumption that, over a considerable portion of heavy oil field life, production costs can be shared

^{24/} The relationship of HB 207 to the issues raised by this paper is discussed further in Appendix A.

^{25/} This, for example, is the purpose behind BLM's proposed heavy oil royalty regulations. Those regulations, which would establish a sliding-scale royalty for heavy oil wells, are intended to "place marginal or uneconomical shut-in oil wells back in production, provide an economic incentive to implement enhanced oil recovery projects, and delay the plugging of these wells until the maximum amount of economically recoverable oil can be obtained from the reservoir or field." 60 *Federal Register* at 18081 (April 10, 1995).

with other, conventional oil production from the same unit. And, as discussed in Section I, ante, the current momentum that has driven the 1994-95 pilot drilling and technical studies at Milne Point risks being lost if the project's economic prospects remain discouraging;

- ◇ **Credibility.** Simply put, Alaska should look to initiatives that have proven successful in spurring capital investment in marginal fields in other oil producing jurisdictions.
- ◇ **Sufficiency.** No one can guarantee the impact of any development initiative. On the other hand, if it is apparent that a given proposal would leave project economics below the competitive threshold, there is nothing gained by the exercise--and perhaps considerable to lose.
- ◇ **Necessity.** The state should entertain economic incentives only if it concludes that the initiative will yield the state, and the public, a net economic benefit. Inherent in that philosophy is the proposition that the state should do no more than is reasonably necessary to induce the targeted activity. The state, in short, should not leave money on the table.

B. The Proposed Initiative--A Five-Year Royalty Suspension on New Heavy Oil Wells.

This paper, and HB 325, propose that the state suspend royalties, for the first five years of production, on the first 500 barrels of heavy oil produced from each new heavy oil well drilled on Alaska's North Slope after June 30, 1996.

The essential attributes of the proposal include:

- ◇ **The Five-Year Suspension.** The suspension would be applied separately for each new heavy oil well drilled. When each well achieved five years' production, full lease royalties--at either 12.5% or 20%--would apply to all future production from that well.

Because new heavy oil wells would be drilled over a nine-year development period, there would thus be no sudden shift from royalty-free to royalty-burdened production. Rather, field royalties would be phased in beginning in the sixth year of development, as Chart 13 illustrates.

ADDITIONAL PRODUCTION FROM HEAVY OIL BY DEVELOPMENT YEAR

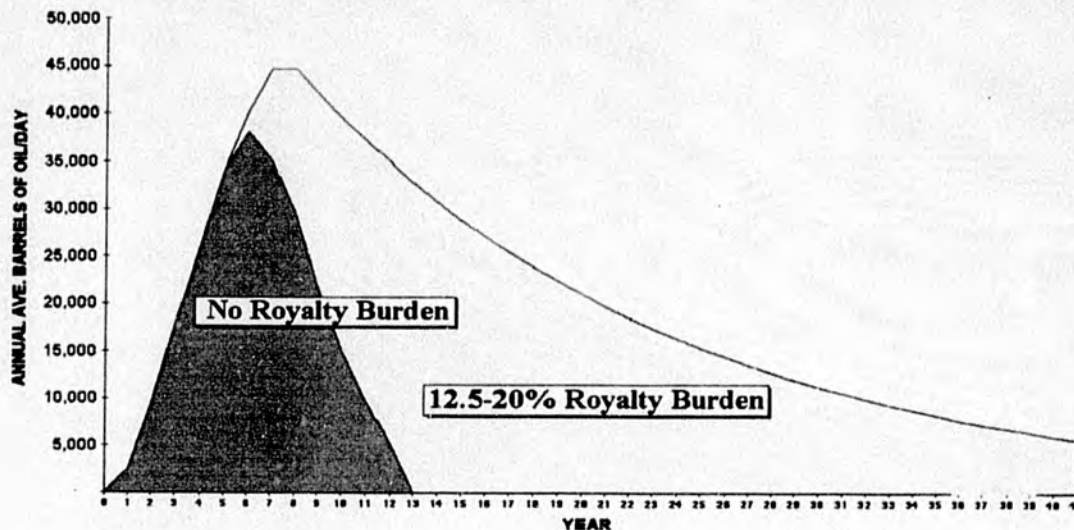


Chart 13

The five-year limitation coincides with the period that most investors consider the longest reasonable time to recover capital costs.

- ◊ **The 500 bbls./day limitation.** 500 barrels per day is as good a working definition as any of a marginal Alaska North Slope oil well. If a new ANS heavy oil well is able to achieve production in excess of that ceiling, that additional production would be subject to full lease royalties.

ANS experience suggests that new heavy oil wells probably won't reach this ceiling. Even initial production rates from Schrader Bluff's Tract 14 wells averaged only 275 bbls./day, and the five best Tract 14 wells--on which OXY's economic forecast, discussed in Section IV, was premised--averaged about 430/bbls./day.

- ◊ **The Limitation to New Wells.** The purpose of this initiative is to encourage additional development of ANS heavy oil reserves. As a result, the proposal does not affect production from any now-existing well; nor does it affect even new production from other formations such as Kuparuk or Sag River.
- ◊ **The Geographic Limitation to the North Slope.** The economic and technical conditions on which the proposal is based are unique to Alaska's North Slope.

C. Application of the Seven Criteria to the Proposed Royalty Suspension.

Among any number of possible royalty structures, the five-year royalty suspension seems to best satisfy each of the seven criteria discussed in subsection (A):

1. The Specificity Criterion

The technical and economic challenges facing development of ANS heavy oil are unique, and by confining the proposal's scope to new heavy oil wells on the North Slope, legislation can be carefully tailored to those peculiarities.

Through that kind of specificity, the proposal addresses one of the drawbacks of Alaska's fiscal system noted in Arthur D. Little's report to the Oil & Gas Policy Council. Alaska, until now, has maintained a one-size-fits-all royalty structure. On the one hand, Little found that this system has been good to companies producing large, profitable fields--indeed, Alaska ranks in the top quarter of oil producing jurisdictions worldwide in that respect. *Little Report* at 150.

On the other hand, Alaska's uniform system ranks poorly in encouraging investment in marginal fields. *Id.*

Little's findings prove the obvious: when setting statewide policy, the legislative and executive branches are inevitably driven by the policy's impact on large fields such as Prudhoe Bay. The specific proposal envisioned in this paper avoids that, and enables Alaska to take a more surgical approach to royalty policy.

2. The Relevancy Criterion

According to Arthur D. Little, Alaska's fiscal regime "is not fiscally efficient," and in fact ranks 48th out of 101 fiscal systems studied worldwide in its impact on field

rate of return. *Little Report* at 10, 150. "The Alaskan terms," moreover, "do not provide any incentive for the development of marginal fields." *Id.* at 172.

The reason is this: Alaska demands money up-front, before the field recovers its capital investment, irrespective of the impact of that demand on the field's ability to recover its investment within a commercially reasonable time. *Id.* at 91 ("A single royalty rate," Little concluded, "can make marginal fields uneconomic to develop.")

By suspending royalties at the outset of production, rather than spreading a reduced royalty over the field's life, the proposal targets the critical capital recovery period, which Little found Alaska to have heretofore ignored.

Moreover, and as Chart 13, *ante*, illustrates, given the typical production profile of a heavy oil well, targeting initial capital recovery, instead of spreading relief over field life, benefits the state as well. Because production will be initially low, but sustained over an extraordinarily long period with an unusually gradual decline rate, the state can expect to receive full lease royalties for a majority of total well production.

3. The Certainty Criterion

The proposal requires no application or agency review. The suspension is imposed by operation of law upon the occurrence of objectively-measured events.

4. The Immediacy Criterion

The suspension will be immediately available for any new heavy oil well drilled on the North Slope after June 30, 1996. And, at least at Schrader Bluff, industry is capable of responding to the initiative quickly. Because the infrastructure necessary for additional Schrader Bluff development is in place, additional heavy oil drilling could begin within months of the proposal's enactment.

5. *The Credibility Criterion.*

Royalty suspensions, Arthur D. Little concluded, "will encourage field development," and are "particularly effective for marginal fields" when they are tied to specific amounts of production. *Little Report* at 192. As the following table indicates, production tax and royalty suspensions have served as a principal tool for oil producing jurisdictions seeking to encourage investment in marginal properties: ^{26/}

////////////////////

^{26/} Most oil producing states do not themselves own significant oil-producing property, and thus the production or severance tax is the principal source of those states' take. As a result, suspensions enacted in other states generally apply to the severance tax, rather than to privately-collected royalties.

Production Tax and Royalty Suspensions in Other Jurisdictions

<u><i>Jurisdiction</i></u>	<u><i>Investment Targeted</i></u>	<u><i>Length of Suspension</i></u>
<i>United States</i>	<i>Gulf of Mexico deep-water wells</i>	<i>Variable, depending on water depth</i>
<i>Texas</i>	<i>High-cost gas wells</i>	<i>10 years</i>
<i>Utah</i>	<i>Wildcat wells</i>	<i>First 12 months</i>
<i>Utah</i>	<i>Development wells</i>	<i>First 6 months</i>
<i>Oklahoma</i>	<i>Horizontal wells</i>	<i>Until payout</i>
<i>Oklahoma</i>	<i>Enhanced oil recovery projects</i>	<i>Until payout</i>
<i>Montana</i>	<i>Horizontal wells</i>	<i>First 18 months</i>
<i>Mississippi</i>	<i>Discovery wells</i>	<i>First 5 years</i>
<i>Mississippi</i>	<i>Re-activated wells</i>	<i>First 3 years</i>
<i>Kansas</i>	<i>Tertiary projects and shallow wells</i>	<i>Life of the project</i>
<i>Kansas</i>	<i>Discovery wells</i>	<i>First 12 years</i>
<i>Arkansas</i>	<i>Discovery wells</i>	<i>First 5 years</i>

According to the Texas Railroad Commission, its 10-year production tax suspension for high-cost gas wells netted that state, for the period 1989-93:

- Ø *A 400% increase in the number of high-cost gas wells drilled annually in Texas above the number drilled annually before enactment of the incentive;*
- Ø *\$4.122 billion more in natural gas produced in the state over the period;*
- Ø *\$240 million in additional sales tax revenues generated over the period;*
- Ø *104,000 new additional employment years created over the period; and*

Ø \$12 billion in additional economic value generated for the state of Texas over the period. ^{27/}

As originally enacted, the Texas incentive was to expire in 1996. Based on its fiscal track record, the Texas legislature renewed the incentive this past year for an additional six years.

6-7. The Sufficiency and Necessity Criteria

As Chart 14 indicates, the five-year, 500 bbls./day royalty suspension moves Schrader Bluff's rate of return from the 12.8% projected by OXY to 15.9%.

The Effect of Royalty Suspension on Schrader Bluff Development Decisions

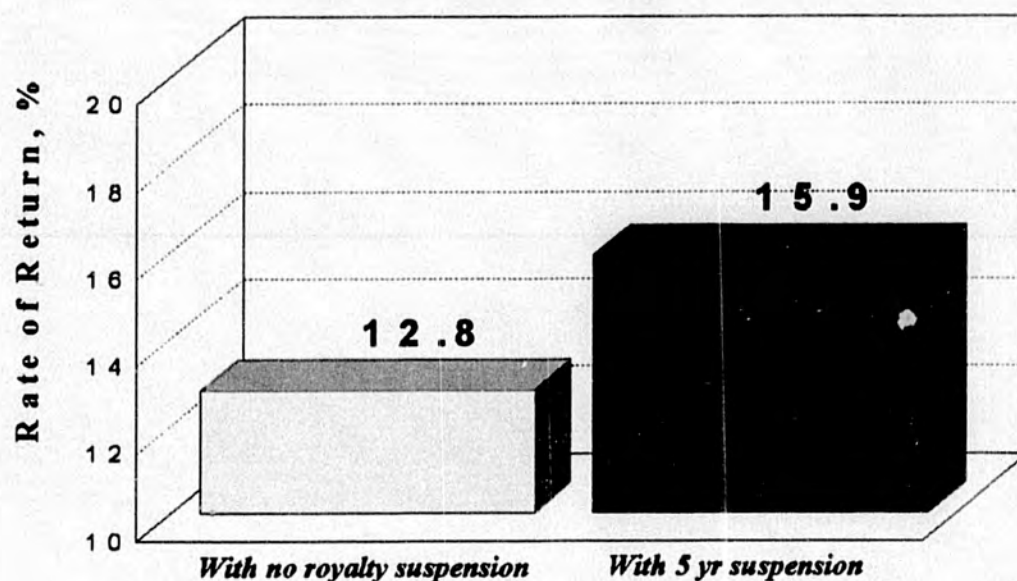


Chart 14

^{27/} Source: Texas Railroad Commission, "Extension of Tax Incentive for the Production of Certain High Cost Gas," undated (1994).

Chart 15 shows that the suspension proposal also reduces the capital recovery period close to a commercially reasonable five years.

The Effect of Royalty Suspension on Schrader Bluff Economics

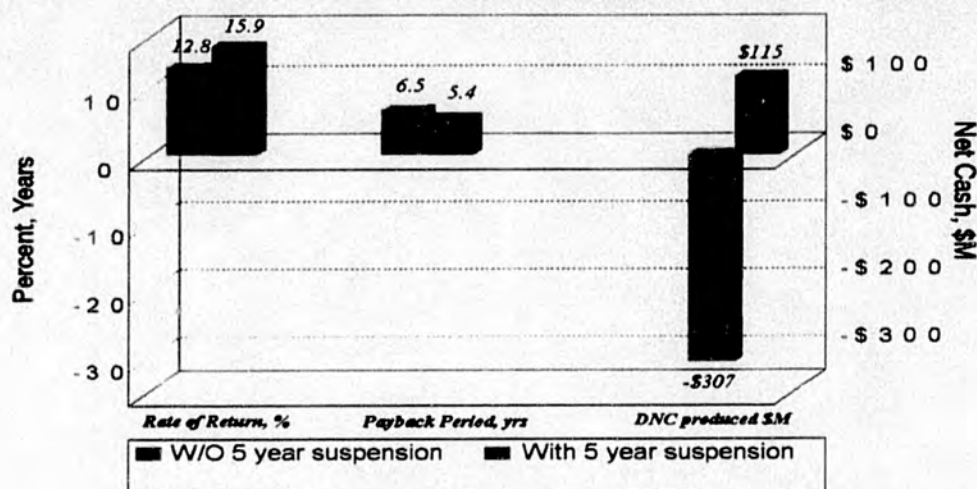


Chart 15

The five-year suspension thus seems *sufficient* to at least make Schrader Bluff development competitive with other industry investment opportunities. It appears to put that endeavor over the hurdle rate--an accomplishment that, as discussed *ante*, does not guarantee funding, but does lift the usually fatal burden of bearing below-hurdle rate economics.

It does so, however, by the thinnest of margins, suggesting that the proposal satisfies the *necessity* criteria as well. That's perhaps best illustrated by the \$115,000 positive net discounted cash flow projected on Chart 15, which is presented on a per-well basis. With each new heavy oil well costing perhaps \$2 million, that \$115,000 translates into slightly more than a 5% profit for any given well.

The suspension proposal's fit with the necessity criteria--that is, with the concept that the state should leave nothing on the table--can be seen in three other ways:

1. Built-in safeguards. The proposal's 500 bbls./day ceiling, for example, protects the state in the event that an engineering breakthrough enables heavy oil producers to pull more oil through new ANS heavy oil wells. If any technologically-driven windfall occurs during the suspension period, the state will receive full lease royalties from the added production.

Moreover, and by the very nature of the suspension proposal, the state is better assured a full share of any increased profits caused by either technology or unanticipated oil price increases. With full lease royalties commencing in each well's sixth year of production, the state's risk of losing its full share of any unanticipated profits ends after five years. Conversely, simply reducing the lessee's royalties over the life of the field--to, say, 5%--would expose the state to that risk for over 40 years. And, the consequence of that difference is magnified by the fact that both oil prices and the state of technology are more predictable in the short run than over a four-decade period.

Similarly, if enhanced recovery techniques ultimately allow more total production than is now estimated, the state would enjoy full lease royalties from that increased production, since it would occur later in field life.

2. *Comparison to Other Incentives.* As Chart 16 shows, a 5% royalty reduction on new heavy oil wells, extending over the life of each well, would also push

Schrader Bluff

development over the hurdle rate. On a

nominal dollar basis, however, the state's royalties over the life of the field would be

considerably less.

Because of their low initial production rates and slow decline rates,

heavy oil wells are

better suited, from a landlord's perspective, to a finite royalty suspension at the outset of production than to a reduced royalty over the life of the field.

3. *Return to the State.* This paper began with Chart 2, which compared: (1) the \$60 million in royalties that the state could expect to receive from the limited Schrader Bluff production forecast by DNR in the Spring of 1995; to (2) the \$425 million in royalties that the state could receive from development of Schrader Bluff under the unit's business plan, even with a five-year royalty suspension.

The suspension proposal would thus seem to meet the essential test of a successful partnership--considerable net benefit to both partners.

HB 325 Meets the Necessary and Sufficiency Criteria....

5 Year Royalty Suspension (HB 325) vs. 5% Royalty for the Well's Life

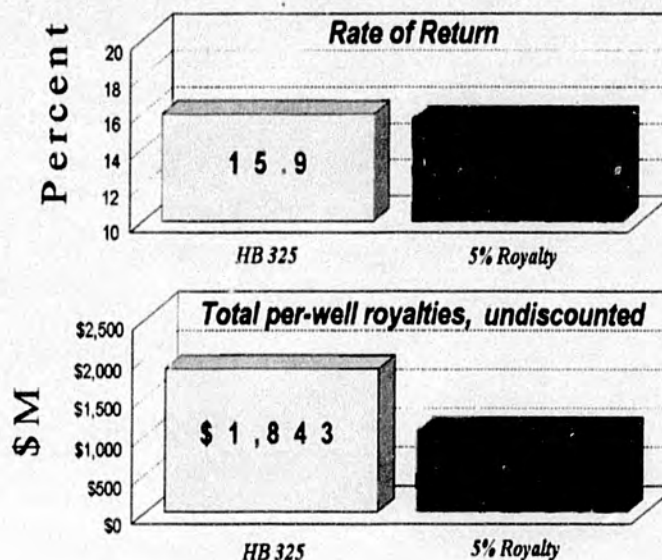


Chart 16

For its part, industry has already contributed about \$270 million to that partnership through the Schrader Bluff and West Sak pilot projects. And most recently, BP won a \$1.6 million U.S. Department of Energy Grant--to which BP will add \$9 million--to further refine heavy oil recovery technology.

Moreover, if development occurs, BP and OXY will contribute another \$550 million capital investment, and on a project basis won't recover that investment for at least seven years. Thus, the state, which will begin receiving full lease royalties on initial wells at the beginning of the project's sixth year, will see a positive net cash flow from its heavy oil partnership sooner than will its industry partners.

VI. Conclusion

Some decision about Alaska's heavy oil reserves will be made this year--since, as we've seen, even a decision to do nothing carries its own risks, and ought to be a conscious choice, if that's the choice made. Indeed, waiting-to-see may present the highest stakes of all, since it is the only alternative that risks losing the entire resource.

Governor Knowles has provided a critical catalyst for this debate--a debate that, given the magnitude of the resource, warrants legislative involvement. And that discourse is likely to yield the best possible answer if it remains guided by three overriding issues:

- ◇ *Are Alaska's heavy oil reserves likely to be developed in the near future even without any stimulus on the state's part?*
- ◇ *If not, then do the benefits of immediate development, and the risk of waiting, warrant a special state/industry partnership to develop those resources now? and*
- ◇ *If immediate development is in the public interest, what form of royalty structure will best meet the seven criteria discussed in this paper?*

Irrespective of the outcome, the fact that the State of Alaska is about to have such a business-like discussion, as discussions between potential partners should be, sends an encouraging signal about the direction of Alaska's economic climate into the next century.

**Appendix A: Some Questions About the Heavy Oil
Five-Year Royalty Suspension Proposal**

Q: Why don't companies with heavy oil reserves simply use the process established last year in HB 207 (Ch. 85, SLA 1995).

HB 207 authorized discretionary royalty relief in three instances: (1) for new marginal fields; (2) to restore shut-in production; and (3) to prolong the economic life of older fields. A new field is eligible for relief only if "the field or pool has not previously produced oil or gas for sale." AS 38.05.180(j)(1)(C). About 3,000 bbls./day are produced from Schrader Bluff's Tract 14 pilot project. Schrader Bluff would thus be ineligible for "new marginal field" relief, and the remaining bases for relief under HB 207 are simply inapplicable.

For its part, Arco did produce and sell oil from its West Sak Sands pilot project at the Kuparuk River Unit, but has since abandoned that production. Arco, therefore, might be eligible for relief under HB 207 "to reestablish production of shut-in oil."

However, HB 207 imposes another barrier. As the white paper explains, a five-year royalty suspension at the outset of production seems better suited--from both industry's and the state's perspective--to spur additional heavy oil development than a reduced royalty over field life. HB 207, however, requires a minimum 3-5% royalty throughout the life of the field. AS 38.05.180(j)(4). Royalty suspensions, then, are categorically excluded under that legislation.

Of course, HB 207 could be amended. It shouldn't be, for these reasons:

1. As a general statement of state royalty policy, HB 207 sets a proactive tone for future state/industry cooperation in sustaining Alaska's oil and gas industry into the 21st century. It was landmark legislation in that respect--creative royalty management has long been discussed in Juneau, but there hadn't been much concrete action. HB 207 is an accomplishment that does not need revisiting;

2. On the other hand, HB 207 did not purport to solve every development challenge facing the state and the oil industry. That is why, for example, Governor Knowles charged his Oil & Gas Policy Council to address additional royalty management issues after the law had passed. Specifically, the state made a conscious choice, last session, to address heavy oil development separately through the Council and the responsible legislative committees; and

3. As discussed in the white paper, ANS heavy oil development presents unique economic and technical issues that are best addressed on their own. The terms and limitations in a general law such as HB 207 are sensible as a statewide rule--given the

myriad circumstances they will govern. However, and as Arthur D. Little suggested to the Oil & Gas Policy Council, one-size-fits-all policies, which were necessarily developed with larger fields in mind, may actually impair development of smaller or unusual fields. The peculiar challenges facing ANS heavy oil development are ample proof of that.

Lastly, resorting to discretionary agency relief would satisfy neither the certainty nor immediacy criteria that, as the white paper explains, are critical to stimulating heavy oil development during the current window of opportunity presented by existing unit infrastructures, reasonable TAPS pipeline tariffs, and the momentum occasioned by the Tract 14 pilot project and BP's 1994-5 drilling program.

Q. Milne Point already pays no severance tax because of the economic limit factor. Isn't royalty relief asking too much?

Arthur D. Little, in his report to the Oil & Gas Policy Council, concluded that Alaska's royalty structure was "fiscally inefficient," and particularly harmful to marginal fields, because it demanded high payments before a field could recover its capital investment.

For its part, Alaska's severance tax cures that problem, and becomes sensitive to field productivity, through the ELF. However, in the case of marginal endeavors such as ANS heavy oil development, the progressive policies of the severance tax are undermined by a regressive royalty policy. That fact argues for consistency between the two fiscal regimes. The current inconsistency is a problem, then, but for reasons other than the question suggests.

The white paper shows that, even with application of the ELF, development of Alaska's heavy oil reserves is unlikely to occur unless the state revisits its royalty structure for that resource--a fact corroborated by: (1) the industry's inability to develop the resource, despite investing \$270 million in pilot drilling; and (2) DNR's oil production projections. Whether royalty restructuring is "too much" of a price to pay to develop that resource is, of course, the ultimate question. Given, however, that:

(1) the state is likely to receive only \$60 million in royalties from Schrader Bluff production if DNR's production estimates prove true; while

(2) the state may receive \$425 million in royalties if the royalty suspension proposal is enacted, and development of Schrader Bluff's reserves resultantly occurs,

it would seem that the state would not be paying much of a price at all.

Q: OXY received a royalty reduction through a 1994 settlement agreement that restricted its right to apply for additional reductions from DNR. Isn't OXY's support of a royalty suspension an end-run around that agreement?

The 1994 settlement agreement returned OXY's Milne Point royalties to the same rate that the state had promised when OXY's predecessors acquired an interest in the Milne Point leases by competitive bid in 1969. The lease royalty rate was, and for OXY is now again, 12.5%.

Several years after acquiring those leases, Conoco (which was then the unit operator) and the other unit participants applied to DNR to form the Milne Point Unit. The state, however, informed the companies that it would not approve the unit agreement, and would allow the Milne Point leases to lapse, unless the companies agreed to increase the royalty on eight unit leases from 12.5% to 20%.

In late 1985, after oil prices had collapsed, the companies applied to DNR to reduce the unit's royalties. At the time, DNR believed that Milne Point warranted relief, especially given the unusually high 20% royalty that some unit production now bore, but also felt that that it was legally precluded from granting relief until the unit had produced oil for two years.

In January, 1987, the Milne Point Unit was shut-in--DNR having concurred that continued operation of the unit posed an unwarranted economic hardship.

Production resumed in April, 1989, and when two years' total production had been achieved in February, 1990, Conoco and OXY again applied for a reduced royalty. In two separate decisions issued on April 21 and 22, 1991, DNR denied those applications. Conoco and OXY then appealed those denials to Alaska Superior Court.^{1/}

The litigation lasted for over three years. In December, 1993, and after an unsuccessful eight-year effort to reach a royalty agreement with the state, Conoco sold its interest in Milne Point to BP Exploration (Alaska) Inc., as did Chevron.

OXY maintained its minority 8.81% interest in the unit, and in July, 1994 the litigation settled. OXY's royalties were returned to the same 12.5% rate that Alaska had promised OXY's predecessors back in 1969, when the leases were issued. The settlement, however, was personal to OXY. BP remained obligated--and remains obliged today--to pay a 20% royalty on its majority share of production from the eight affected leases.

Section 5.3 of the settlement agreement also restricted OXY's ability to apply to DNR for royalty reductions. That clause reads:

^{1/} *Conoco Inc. v. State of Alaska, Department of Natural Resources, 1JU-91-797Civ.; OXY USA Inc. v. State of Alaska, Department of Natural Resources, 1JU-91-798Civ.*

Notwithstanding paragraph 18(h)(8) of the MPU Agreement and any otherwise applicable law, OXY cannot apply for any reduced royalty: (1) for any of the [eight 20% leases]...during the remaining life of the MPU; or (2) for any other liquid hydrocarbon production from the MPU, for five years from the effective date of this agreement.

By both its terms and intent, the agreement does not attempt to limit the legislature's authority to set state royalty policy. Rather, this clause was inserted after both parties agreed that neither wished to reenact the 4 1/2 years of costly administrative proceedings, and subsequent litigation, consumed by these discretionary royalty reduction applications.

*And in any event, the question is academic, because if HB 325 is enacted, the state will still enjoy the full benefit of its bargain. The proposal would apply **only** to new heavy oil wells drilled after June 30, 1996. DNR's production projections have, as recently as March, 1995, assumed that future Schrader Bluff production will be limited to the unit's pre-existing Tract 14 pilot project. Thus, HB 325 would not affect any production that DNR believed would occur when it entered into the settlement agreement in 1994. ^{2/}*

In the scheme of things, this question is tangential to the heavy oil debate--after all, OXY owns but an 8.81% interest in one heavy oil field. Moreover, one needs to remember that the initiative for this discussion came not from OXY, but from the state itself. OXY was invited to participate in the debate over state oil policy initiated by the introduction of HB 207 and creation of the Oil & Gas Policy Council, and it has always been forthcoming on this count in its discussions with both the administration and the legislature. OXY, like anyone, is subject to new laws, and it welcomes the opportunity to exercise its right to participate in public debate over oil and gas legislation.

^{2/} Indeed, when the settlement agreement was entered into, DNR was not only projecting that no further development of Schrader Bluff would occur beyond the Tract 14 pilot project--it had concluded that the Milne Point Unit as a whole would be abandoned in the year 2006. DNR, *Historical and Projected Oil and Gas Consumption*, February, 1994 at 6-7.

Q: How can we be assured that, if this initiative passes, our heavy oil reserves will actually be developed?

As the white paper explains, improving Schrader Bluff's economic outlook will not guarantee a positive investment decision. It will only allow Schrader Bluff to compete with other investment opportunities. Actual funding is always a function of available budget funds, the quality of competing prospects, and other variables.

Industry, however, does have a considerable stake in following through. First, it has already invested about \$270 million in heavy oil pilot projects--an investment it would plainly like to recoup. Second, lessees with heavy oil reserves do feel some sense of urgency. They know that, given the right economic climate, ANS heavy oil reserves are more valuable now than perhaps they'll ever be. There is an existing on-site infrastructure now; transportation costs are tolerable; and the momentum spawned by the Tract 14 pilot project and BP's recent drilling provides a stimulus to additional development that may well evaporate in a climate of disinterest.

Successful development of North Slope heavy oil is dependent on industry's ability to increase production rates and lower production costs, and the state's interest in crafting a workable royalty structure. Section II of the white paper explains how industry is meeting its obligations in that respect, and by enactment of an effective royalty initiative, the state would have done all it can. In that event, heavy oil would not be lightly disregarded by industry.

Finally, one should remember that the royalty suspension would apply solely to new heavy oil wells drilled after June 30, 1996. If Schrader Bluff or other ANS heavy oil reserves aren't developed, the state loses nothing.

Q: Why isn't this just another industry giveaway?

Bear in mind, in this respect, that the state "gives" nothing unless industry contributes to the partnership by heavily investing in heavy oil development.

But, yes, if the state concludes that Schrader Bluff and the Kuparuk River Unit's West Sak sands will likely be developed *while* existing unit infrastructures remain operational; *while* TAPS tariffs remain reasonable; and *while* existing development momentum perseveres, then the royalty suspension proposal is a giveaway, and the state shouldn't do it.

Q: If OXY owns only an 8.81% interest in Schrader Bluff, why is it so interested in all of this?

To begin with, heavy oil is something of a cause celebre for OXY. It is a nationwide leader in developing creative methods for lifting heavy oil.

And Milne Point is OXY's core asset in Alaska. OXY is the only original Milne Point participant remaining, and its perseverance over 15 difficult years reflects a stubborn commitment to realizing that unit's full potential.

And frankly, that is all to Alaska's advantage. The gene pool of Alaska's oil industry is shrinking, and that's unhealthy. Conoco gave up on Alaska in 1993, and other companies have considerably reduced their Alaska presence, laying off hundreds of Alaska employees over the past several years. The energetic participation of new, independent companies in Alaska's economy should be encouraged--both for its own sake, and to send a clear message that Alaska welcomes active, involved newcomers.

Unlocking the Heavy Oil Potential on Alaska's North Slope

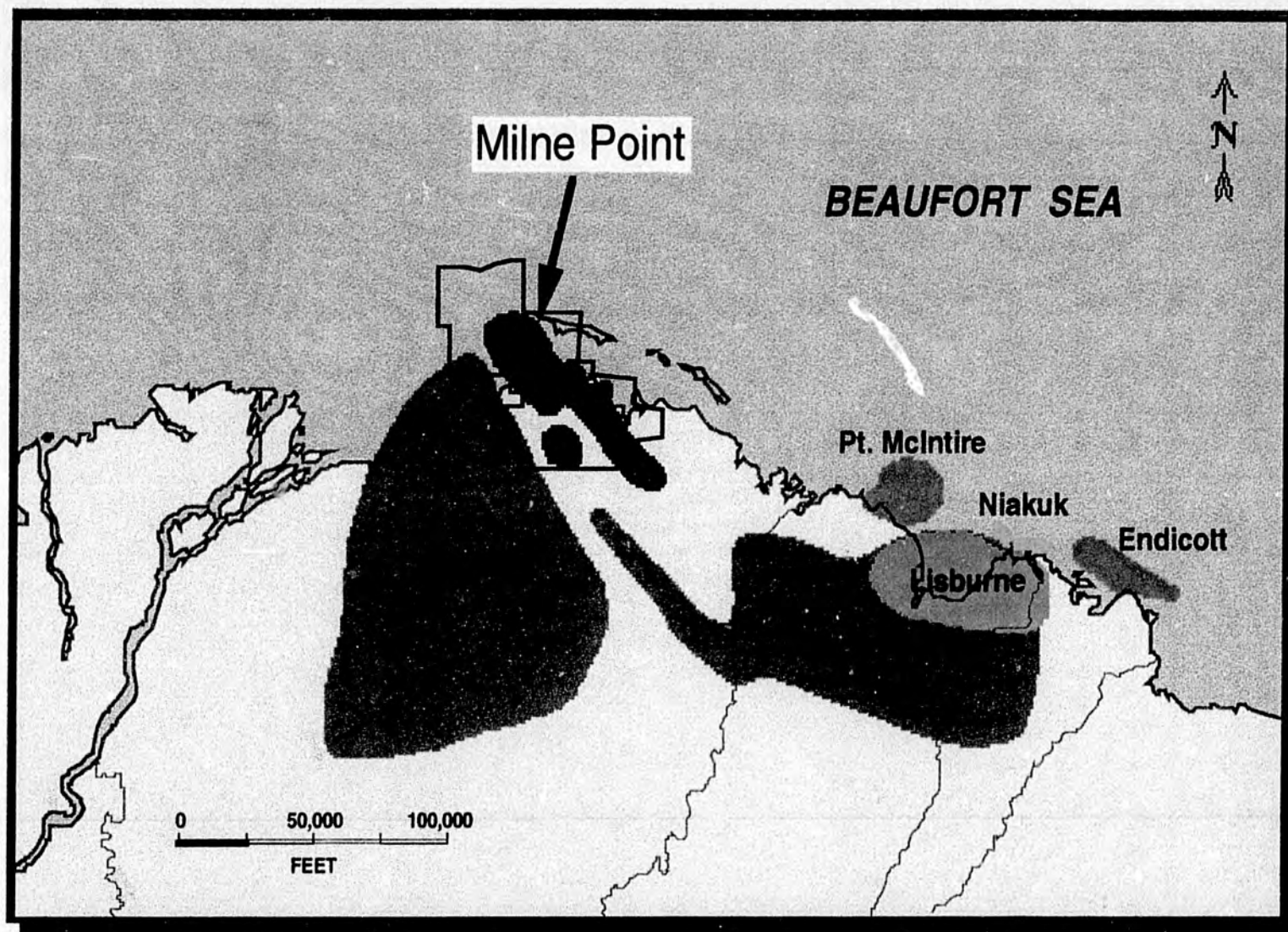
**Presentation by Occidental Oil and Gas Corporation before
the House Oil & Gas Committee on November 14, 1995**



BACKGROUND INFORMATION

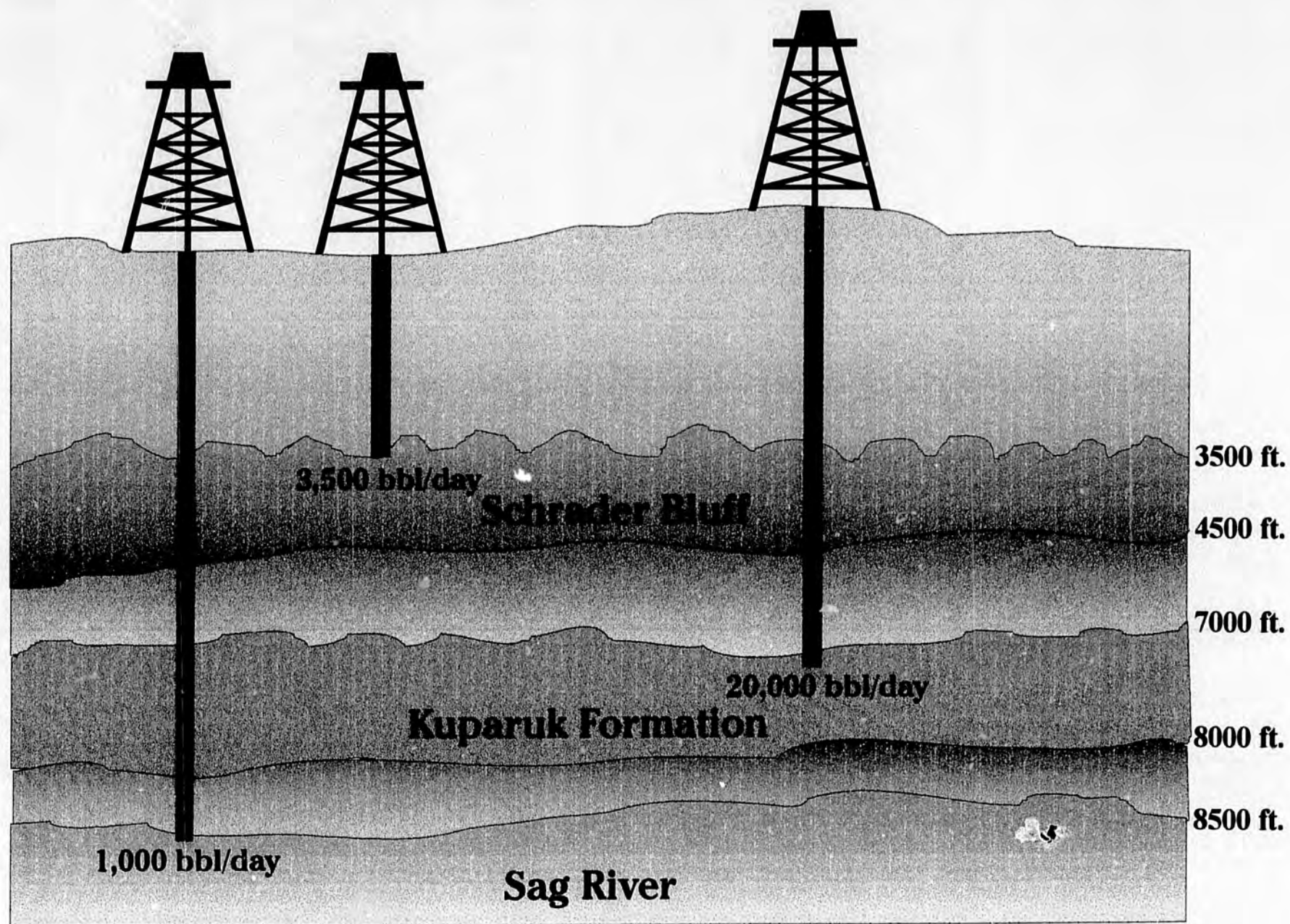
WHO IS OCCIDENTAL OIL AND GAS CORPORATION?

- *Oil & gas part of Occidental Petroleum Corporation*
- *Large independent in the US, no refining or marketing operations*
- *No financial interest in TAPS*
- *Operator of Heavy Oil properties in California*
- *The last original owner in Milne Point Unit with around 9% WI*



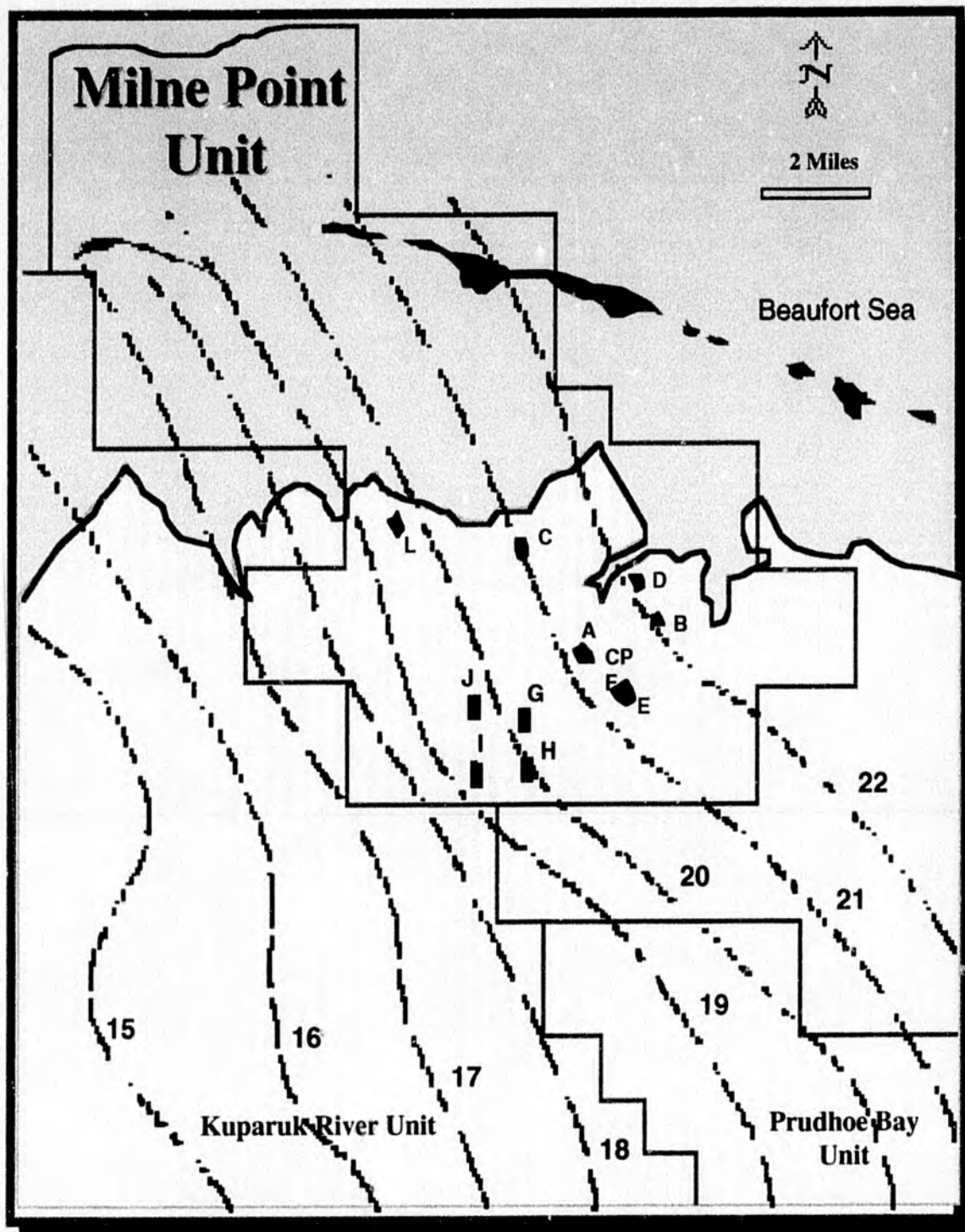
North Slope Fields and Milne Unit Outline

Occidental and BP produce oil from three formations at MPU

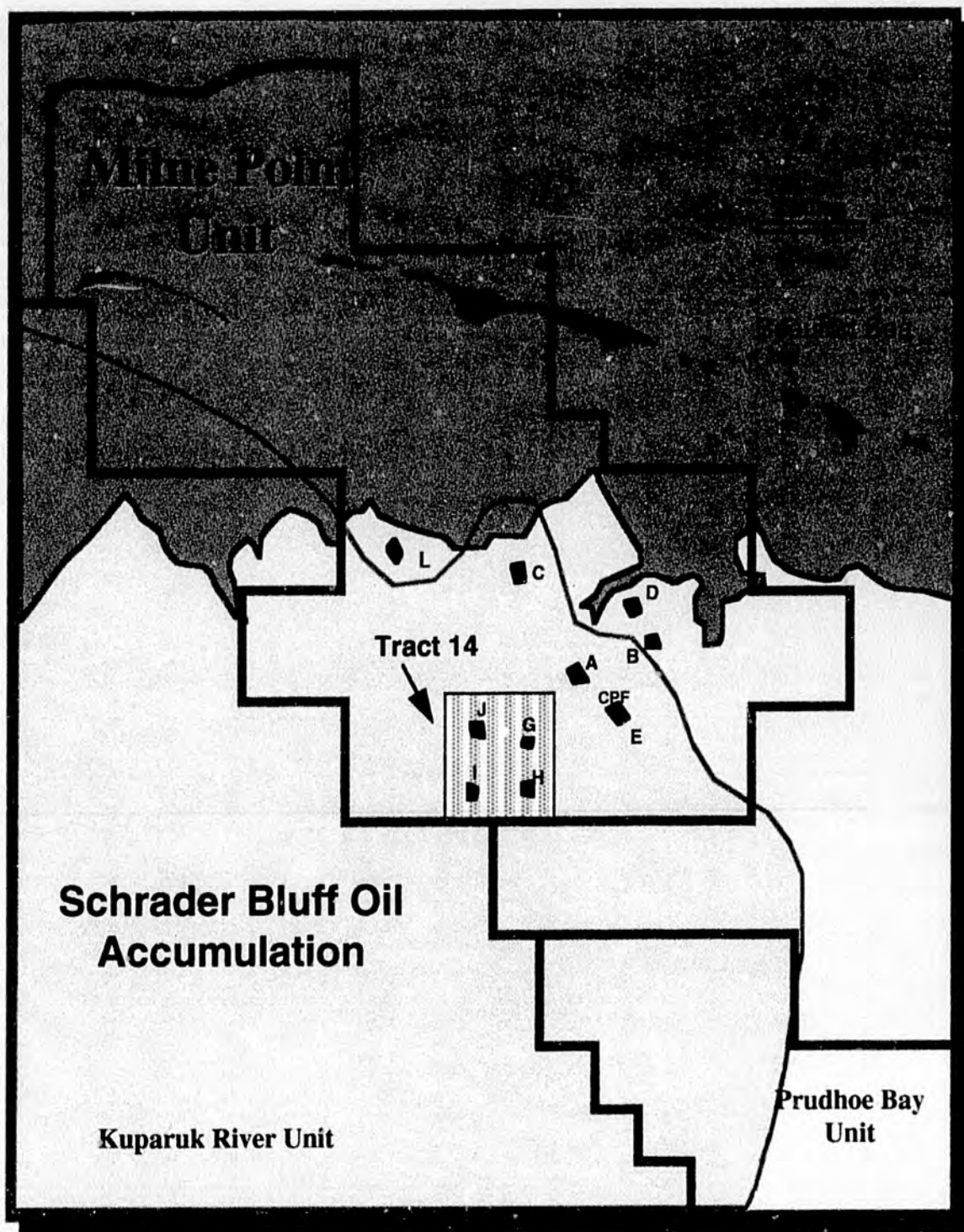


What is "heavy oil"?

- Low gravity
- Thick
- Produces slowly over a long period of time
- Disadvantaged in market place
- Capital intensive
- A focus of current debate on oil and gas incentives



Schrader Bluff Generalized API Gravity Map



Schrader Bluff Oil Accumulation

Previous Heavy Oil Development

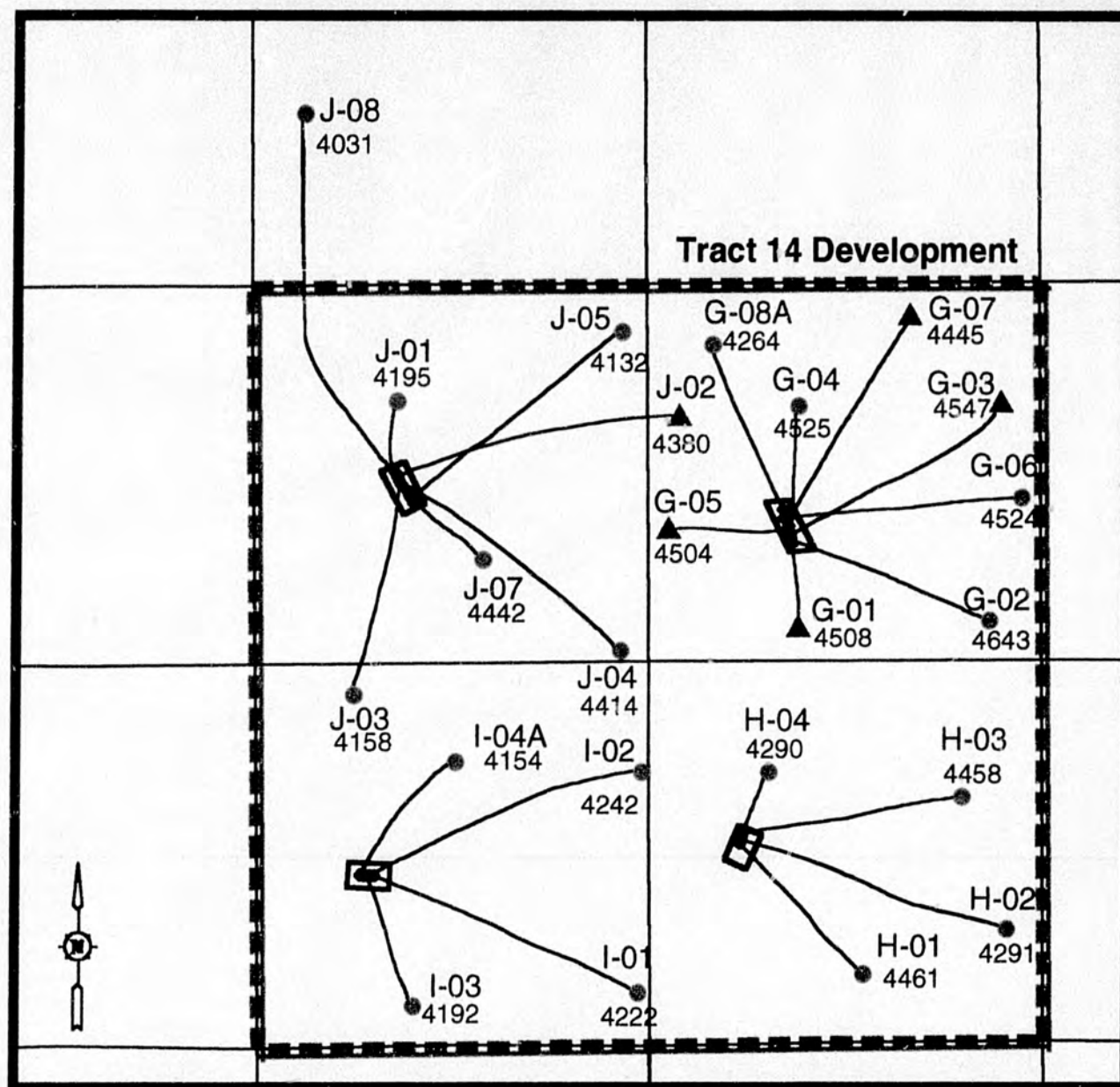
ARCO/West Sak Project

- *Spent \$135 Million on 13 wells and related facilities*
- *Average producing rate = 250 BOPD per well*
- *Recovery = 0.8 million barrels before abandonment in 1986*
- *Total Capital Investment = \$169/Barrel*
- *Uneconomical*

The Tract 14 Experience

Milne Point Unit Schrader Bluff Tract 14 Development

- Producer
- ▲ Injector



● TVDss (feet)

1 Mile