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-ALASKA-

HISTORICAL AND PROJECTED OIL AND GAS CONSUMPTION

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PREPARED BY

THE INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH
UNIVERSITY OF ALASKA

AND

DIVISION OF MINERALS AND ENERGY MANAGEMENT
DEPARTMENT OF NATURAL RESOURCES

FOR

THE ALASKA STATE LEGISLATURE

- ALASKA -

HISTORICAL AND PROJECTED OIL AND GAS CONSUMPTION

for

Department of Natural Resources
State of Alaska

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PREFACE

This study is in response to Alaska Statute, Section 38.05.183. SALE OF ROYALTY.

> (d) Oil or gas taken in kind by the state as its royalty share may not be sold or otherwise disposed of for export from the state until the commissioner determines that the royalty-in-kind oil or gas is surplus to the present and projected intra-state domestic and industrial needs. The commissioner shall make public, in writing, the specific findings and reasons on which his determination is based and shall, within 10 days of the convening of a regular session of the legislature, submit a report showing the immediate and long-range domestic and industrial needs of the state for oil and gas and an analysis of how these needs are to be met.

It is the seventh in a series of reports on oil and gas consumption and projections of future demands. The titles of previous reports are as follows:

1. (1975) Present and Historical Demand for Oil and Gas in Alaska, Alaska Oil Demand 1975-2000, and Future Alaskan Natural Gas Demand by Georgia Bewley et al. Division of Geological and Geophysical Survey, Department of Natural Resources, State of Alaska, Fall 1975.

2. (1976) Energy Consumption in Alaska: Estimate and Forecast by Kent Miller and Oliver Scott Goldsmith. Institute of Social and Economic Research (ISER), University of Alaska, January 1977.

3. (1976) Historic and Projected Demand for Oil and Gas in Alaska: 1972-1995 by Kristina O'Connor. Division of Minerals and Energy Management (DMEM).

4. (1977) Oil and Gas Consumption in Alaska 1976-2000 by Oliver Scott Goldsmith and Tom Lane. ISER, January 1978.

5. (1978) Historic and Projected Oil and Gas Consumption by Kristina O'Connor and Randall Montbrian. DMEM, February 1979.

6. (1979) Historic and Projected Oil and Gas Consumption by Oliver Scott Goldsmith (ISER) and Kristina O'Connor (DMEM), January 1980.

The data in each report has been presented in slightly different format, and the sources available at the time each report was compiled were not always similar so that differences among the historical figures occur from time to time. In this current study, we have recalculated two important historical data tables for the entire decade of the 1970s. The information in the tables on motor vehicle fuel consumption and natural gas use has been completely revised. As a result, in subsequent years, production of this report should be greatly facilitated.

The analysis of oil and gas consumption in this study is consistent with two other efforts currently underway within the state to forecast future energy needs. These are the following:

1. The Railbelt Electric Power Alternatives Study under contract to Battelle Northwest Laboratories for the Office of the Governor.

2. Long-Term Energy Plan for Alaska under contract to Applied Economic Associates for the Division of Energy and Power Development.

The primary integrating device utilized in all of these studies is the Man in the Arctic Program (MAP) econometric model which provides estimates of the level of future economic activity for the state and its various regions.

I. HISTORICAL OIL AND GAS CONSUMPTION IN ALASKA

I.A. Total

Total use of petroleum in Alaska in 1980 was 190.8 million barrels of crude oil equivalent (BOE) or about 523 thousand BOE daily. The great majority of this consisted of natural gas which accounted for 86 percent of the total.

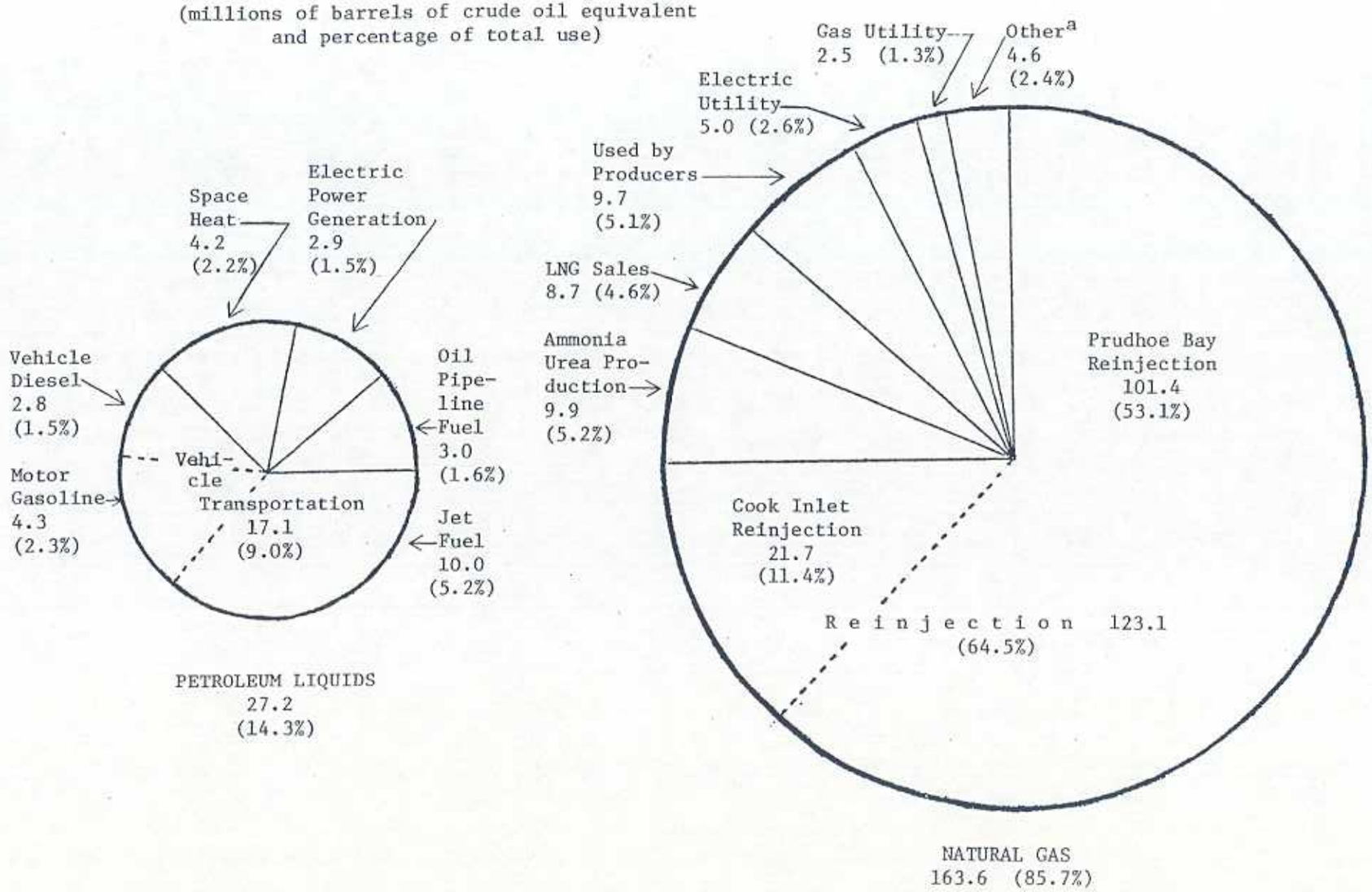
As Figure 1 indicates, reinjection of natural gas into oil fields was the dominant use (64 percent), followed by motor vehicle fuels use (9 percent). All other uses accounted for 27 percent of the total.

A large part of the natural gas used for reinjection will ultimately be recovered from the field and should, thus, not be considered as consumption. Adjusting for this total, consumption for 1980 is 67.7 million BOE or 185 thousand BOE daily, of which 60 percent is natural gas and 40 percent, liquid petroleum. This is equivalent to 630 thousand mcf of natural gas and 77 thousand barrels (3.2 million gallons) of petroleum liquids daily.

Most of the growth in use between 1979 and 1980 can be attributable to reinjection of natural gas, which increased by about 20 percent. Consumption of natural gas for other uses rose less than one-half of one percent, while consumption of liquid petroleum was up about 1 percent.

FIGURE 1. 1980 ESTIMATED OIL AND GAS USE IN ALASKA

(millions of barrels of crude oil equivalent and percentage of total use)



[a]Includes military use and pipeline and power generation uses in Prudhoe Bay area.

This pattern of growth is a continuation of the trend in recent years. The use of natural gas for reinjection has been the most rapidly growing category of use. This has been followed by growth in consumption of natural gas attributable to an expansion of the ammonia-urea plant on the Kenai Peninsula and consumption of both gas and fuel oil in conjunction with production and transportation of the crude oil from the Prudhoe Bay field. These growth trends are depicted in Tables 1A and 1B.

I.B. Natural Gas

Historical and 1980 estimated natural gas use is shown in Tables 2A and 2B by market area and use. The market area distinction is important because of the high transport cost of gas which presently precludes a statewide market for gas.

Prudhoe Bay is the largest market, accounting for 68 percent or 627.8 million mcf of the total statewide use of 929.5 million mcf. Almost all of this gas (92 percent)is reinjected, but a substantial quantity is used on leases and provides fuel to the electricity generating plant connected with the field and to the first four pump stations on the pipeline. These categories of consumption which can be loosely termed as production and transportation related were 51.5 million mcf in 1980.

Cook Inlet is the market with the largest number and variety of customers and accounts for virtually all of the rest of the natural gas used in the state. Of the 300.7 million mcf expected to be used in

TABLE 1A. ALASKA OIL AND GAS USE

(commodity units)

	PETROLEUM LIQUIDS (barrels of product)		NATURAL GAS (mcf)		NATURAL GAS (Net of Reinjection) (mcf)	
	Total 10^6	Daily Average 10^3	Total 10^6	Daily Average 10^3	Total 10^6	Daily Average 10^3
1970	--	--	217	594	144	395
1971	--	--	228	625	154	422
1972	--	--	223	611	147	403
1973	--	--	223	611	135	370
1974	--	--	228	625	141	386
1975	--	--	256	701	163	447
1976	24.5	67	271	743	160	438
1977	23.7	65	376	1,030	193	529
1978	26.2	72	603	1,652	217	595
1979	27.6	76	738	2,022	229	627
1980 (est.)	28.1	77	930	2,548	230	630

SOURCE: See later tables.

TABLE 1B. ALASKA OIL AND GAS USE

(barrels of crude oil equivalents)

	PETROLEUM LIQUIDS		NATURAL GAS		NATURAL GAS (Net of Reinjection)		COMBINED OIL AND GAS (Net of Reinjection of Gas)	
	Total 10^6	Daily Average 10^3	Total 10^6	Daily Average 10^3	Total 10^6	Daily Average 10^3	Total 10^6	Daily Average 10^3
1970	--	--	38	104	--	--	--	--
1971	--	--	40	110	--	--	--	--
1972	--	--	39	107	--	--	--	--
1973	--	--	39	107	--	--	--	--
1974	--	--	40	110	--	--	--	--
1975	--	--	45	123	28	77	--	--
1976	23.8	65	48	132	28	77	51.8	142
1977	23.1	63	66	181	34	93	57.1	156
1978	25.3	69	106	290	38	104	63.3	173
1979	26.8	73	130	356	40	110	66.8	183
1980 (est.)	27.2	75	164	449	41	112	68.2	187

For conversion factors, see Tables 2B and 5A, 5B, and 5C.

SOURCE: See later tables.

TABLE 2A. HISTORICAL ALASKA NATURAL GAS USE[a]

(million mcf)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980(est)[o]
TOTAL USE[b]						256.399	271.162	375.832	602.687	738.485	929.5
COOK INLET[c]	216.89	227.93	222.80	223.10	228.44	252.554	265.253	279.961	293.800	305.056	300.7
Reinjection[d]	73.14	73.88	76.13	87.78	86.81	95.183	111.082	115.131	114.074	119.825	123.5
LNG Exports[e]	57.10	63.24	59.87	60.99	61.87	64.777	63.509	66.912	60.874	64.111	49.7
Ammonia Urea Production[f]	17.86	19.49	20.58	20.64	22.10	23.888	24.257	28.620	48.879	51.657	56.2
Electric Utility Sales[g]	8.25	10.31	13.16	15.48	17.11	19.619	22.188	23.590	24.591	28.155	28.2
Use on Lease, Vented, and Shrinkage[h]	46.61	45.25	36.56	20.90	23.89	28.830	24.466	24.396	23.524	17.520	20.0
Gas Utility Sales[j]	6.718	8.243	8.952	9.653	9.816	12.044	12.552	12.683	13.454	14.045	14.1
Military Sales[k]	6.110	6.549	6.473	6.069	5.684	5.842	5.424	5.100	5.126	4.986	5.0
Miscellaneous Sales to Other Producers, Refiners, and Pipelines[l]	1.10	.97	1.08	1.59	1.16	2.371	1.775	3.529	3.277	4.757	4.0
Item: Alaska Pipeline Company Sales[m]	17.238	20.729	24.093	26.402	26.847	30.423	-	28.281	28.780	30.295	30.6
Item: Anchorage Natural Gas Sales[n]	11.099	14.080	17.610	20.139	20.996	24.281	23.130	22.538	23.489	25.004	25.6

TABLE 2A. (continued)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980(est)[o]
PRUDHOE BAY						3.047	5.077	94.992	307.994	432.498	627.8
Reinjection[h]	0	0	0	0	0	0	0	68.080	271.854	390.136	576.2
Use on Lease, Vented, and Shrinkage[h]						2.277	3.414	24.069	20.787	25.068	30.9
Pipeline Fuel[h]						.770	1.663	2.843	7.261	8.930	11.8
Electric Power Generation[h]	0	0	0	0	0	0	0	0	8.092	8.364	8.8
BARROW						.798	.832	.879	.893	.931	1.0
Government and Utility Sales[h]						.267	.390	.504	.541	.582	.6
Use on Lease, Vented, and Shrinkage[h]						.531	.442	.375	.352	.331	.4

See accompanying table notes on following page.

TABLE 2A. Notes

a. Revised from reports of previous years.

b. State of Alaska, Department of Natural Resources, Division of Oil and Gas Conservation (DOGC), Monthly Report of Gas Disposition.

c. Before 1975 from Natural Gas Demand and Supply to the Year 2000 in the Cook Inlet Basin of South Central Alaska, Stanford Research Institute (SRI), prepared for Pacific LNG Company, November 1977, Table 3, p. 10. After 1974 from Monthly Report of Gas Disposition, DOGC.

d. Before 1975 from SRI; after 1974 this is the sum of two items: (1) rental gas sales from the Kenai and Beaver Creek gas fields reported in Kenai Gas Sales, internal document of DOGC, and (2) injection from various gas fields reported in Monthly Report of Gas Disposition, DOGC.

e. Before 1975 from SRI; after 1974 this is the sum of two items: (1) sales to Phillips LNG from the Kenai and Beaver Creek gas fields reported in Kenai Gas Sales, internal document of DOGC, and (2) sales from the North Cook Inlet gas field reported in Monthly Report of Gas Disposition, DOGC.

f. Before 1975 from SRI; after 1974 this is the sum of two items: (1) sales to Collier Chemical from the Kenai and Beaver Creek gas fields reported in Kenai Gas Sales, internal document of DOGC, and (2) sales from the McArthur River field reported in Monthly Report of Gas Disposition, DOGC.

g. Before 1975 from SRI; after 1974 from Electric utility sales reported by Anchorage Natural Gas to Alaska Public Utilities Commission (APUC) plus Beluga River gas field sales to Chugach Electric reported in Monthly Report of Gas Disposition, DOGC.

h. Before 1975 from SRI; after 1974 from Monthly Report of Gas Disposition, DOGC.

j. Sales to final consumers reported in Annual Financial Reports to APUC. Includes Anchorage Natural Gas and Kenai Utility Service Corporation. Anchorage Natural Gas Rate Schedule Categories revised in 1975, so earlier years obtained from internal records of Anchorage Natural Gas.

k. Annual Financial Reports to APUC of Alaska Pipeline Company and Anchorage Natural Gas.

TABLE 2A. Notes (continued)

l. This category is primarily composed of three components: (1) total sales from gas fields in Cook Inlet net of sales from (a) Beaver Creek, (b) Beluga River, (c) Kenai, (d) McArthur River, (e) North Cook Inlet, taken from Monthly Report of Gas Disposition, DOGC; (2) the difference between sales from Kenai and Beaver Creek gas fields reported in DOGC Monthly Report of Gas Disposition and Kenai Gas Sales, working document of DOGC; and (3) the portion of Kenai and Beaver Creek gas sales not attributable to Ammonia Urea, LNG, rental for injection, Alaska Pipeline Company, or Kenai Gas Utility from DOGC Kenai Gas Sales. This category is calculated as the residual of Cook Inlet gas use and, therefore, does not exactly equal these three components.

m. Consists of Anchorage Natural Gas Utility Sales (including some sales to electric utilities and military) and direct military sales. Annual Financial Report to APUC.

n. Sales to final consumers, utilities, and military. Annual Financial Report to APUC.

o. Estimates based upon first nine months of the year.

TABLE 2B. HISTORICAL ALASKA NATURAL GAS USE

(millions of barrels of crude oil equivalent)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980(est)
TOTAL USE						45.1	47.7	66.1	106.1	130.0	163.6
COOK INLET	38.2	40.1	39.2	39.3	40.2	44.4	46.7	49.3	51.7	53.7	52.9
Reinjection	12.9	13.0	13.4	15.4	15.3	16.8	19.6	20.3	20.1	21.1	21.7
LNG Exports	10.0	11.1	10.5	10.7	10.9	11.4	11.2	11.8	10.7	11.3	8.7
Ammonia Urea Production	3.1	3.4	3.6	3.6	3.9	4.2	4.3	5.0	8.6	9.1	9.9
Electric Utility Sales	1.5	1.8	2.3	2.7	3.0	3.5	3.9	4.2	4.3	5.0	5.0
Use on Lease, Vented, and Shrinkage	8.2	8.0	6.4	3.7	4.2	5.1	4.3	4.3	4.1	3.1	3.5
Gas Utility Sales	1.2	1.5	1.6	1.7	1.7	2.1	2.2	2.2	2.4	2.5	2.5
Military Sales	1.1	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9
Miscellaneous Sales to Other Producers, Refiners, and Pipelines	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.6	0.6	0.8	0.7
Item: Alaska Pipeline Company Sales	3.0	3.6	4.2	4.6	4.7	5.4	-	5.0	5.1	5.3	5.4
Item: Anchorage Natural Gas Sales	2.0	2.5	3.1	3.5	3.7	4.3	4.1	4.0	4.1	4.4	4.5

TABLE 2B. (continued)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980(est)
PRUDHOE BAY						0.5	0.9	16.7	54.2	76.1	110.5
Reinjection	0	0	0	0	0	0	0	12.0	47.8	68.7	101.4
Use on Lease, Vented, and Shrinkage						0.4	0.6	4.2	3.7	4.4	5.4
Pipeline Fuel						0.1	0.3	0.5	1.3	1.6	2.1
Electric Power Generation	0	0	0	0	0	0	0	0	1.4	1.5	1.5
BARROW						0.1	0.1	0.2	0.2	0.2	0.2
Government and Utility Sales						0	0.1	0.1	0.1	0.1	0.1
Use on Lease, Vented, and Shrinkage						0.1	0.1	0.1	0.1	0.1	0.1

See Table 2A for notes and sources.

Components may not add to totals due to rounding.

Conversion from Natural Gas to Crude Oil Equivalent is based on 1.021 btu/cubic foot of gas.
(1 mcf gas x .1760 = 1 barrel of crude oil equivalent)

1980, the uses by order of volume are as follows (with percentages of the market total in parentheses):

1. reinjection (41 percent)
2. ammonia-urea production (19 percent)
3. LNG exports (17 percent)
4. electric utility sales (9 percent)
5. use on lease, vented, and shrinkage (7 percent)
6. gas utility sales (5 percent)
7. military sales (1 percent)
8. miscellaneous sales (1 percent)

The Barrow market accounts for less than one-half of one percent of the state total.

From this breakdown, it is clear that three large industrial uses account for 95 percent of all natural gas use in the state (881.6 million mcf). These are petroleum production, distribution, and refining-related uses; ammonia-urea production; and LNG production for export. Sales to electric utilities, gas utilities, and the military account for the remainder which is 5 percent of the total (47.9 million mcf or 8.5 million BOE).

Recent important trends in natural gas use are the following:

1. Rapid increase in gas use for reinjection at Prudhoe Bay with constant reinjection use in Cook Inlet.
2. Doubling of gas use as feedstock in ammonia-urea production in 1978.

3. Doubling of gas use in petroleum production, transportation, and refining with the completion of the Alyeska pipeline in 1977.
4. Moderation in growth in sales of gas to electric and gas utilities.
5. Relatively constant levels of military use and LNG exports.

I.C. Petroleum Liquids[1]

Petroleum liquids consumption can be divided into four categories, of which vehicle transportation is the largest. Tables 3A and 3B show that vehicle transportation accounted for 64 percent of the 1,180 million gallons of product (28.1 million barrels of product) used in the state. The remaining categories by order of consumption are space heating with 15 percent and oil pipeline related and electric power generation, each with about 10 percent of the total.

Fuels for vehicle transportation include gasoline, jet fuel, and diesel fuels used for highway, marine, and aviation uses. Tables 4 and 5 show the historical patterns of these fuels as reported to the State of Alaska Department of Revenue. (Some nontransport uses of fuel are included in this data since they are reported with transport fuel.) Jet fuel consumption dominates vehicle transport fuel use with 436 million gallons (10.38 million barrels of product) followed by gasoline with 200 million gallons (4.76 million barrels of product) and diesel with 120 million gallons (2.87 million barrels of product) (after netting out nonvehicle transport diesel uses reported to Department of Revenue).

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[1] Natural gas liquids use is not considered in this analysis.

TABLE 3A. SUMMARY: ALASKA PETROLEUM LIQUIDS CONSUMPTION

(million barrels of product)

Year	Vehicle Transportation[a]	Oil Pipeline[b]	Space Heat[b]	Electric Power[b] Generation	Total
1970	--	0	--	--	--
1971	12.0	0	--	--	--
1972	13.1	0	--	--	--
1973	14.9	0	--	--	--
1974	16.7	0	--	--	--
1975	18.5	0	--	--	--
1976	18.5	0	3.7	2.3	24.5
1977	16.7	.7	3.7	2.6	23.7
1978	17.2	2.3	4.0	2.7	26.2
1979	18.1	2.6	4.1	2.8	27.6
1980 (est.)	18.0	3.0	4.2	2.9	28.1

[a]Total from Table 4E minus off-highway exempt diesel use (diesel for space heating and power generation) and Alyeska pipeline fuel consumption (pumping and other uses).

[b]See Table 6.

TABLE 3B. SUMMARY: ALASKA PETROLEUM LIQUIDS CONSUMPTION

(million barrels of crude oil equialent)

Year	Vehicle Transportation	Oil Pipeline	Space Heat	Electric Power Generation	Total
1970	--	0	--	--	--
1971	11.53	0	--	--	--
1972	12.49	0	--	--	--
1973	14.27	0	--	--	--
1974	16.06	0	--	--	--
1975	17.78	0	--	--	--
1976	17.77	0	3.7	2.3	23.8
1977	15.98	.7	3.7	2.6	23.1
1978	16.33	2.3	4.0	2.7	25.3
1979	17.30	2.6	4.1	2.8	26.8
1980 (est.)	17.11	3.0	4.2	2.9	27.2

For conversion factors, see Tables 5A, 5B, and 5C.

SOURCE: See Table 3A.

TABLE 4A. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: GASOLINE[a]

(million gallons)

	Highway		Marine		Aviation		Total		Grand Total
Year	Taxable	Exempt[b]	Taxable	Exempt[c]	Taxable	Exempt[b]	Taxable	Exempt	
1971	100.136	12.929	5.645	.012	8.588	2.595	114.369	15.536	129.905
1972	112.129	28.435	4.688	.141	9.288	4.130	126.105	32.706	158.811
1973	119.550	14.752	6.395	.023	10.714	1.819	136.659	16.594	153.253
1974	128.850	12.634	6.352	.025	13.194	1.728	148.396	14.387	162.783
1975	167.494	7.222	5.263	.200	13.370	1.215	186.127	8.637	194.764
1976	186.620	5.274	5.613	.267	13.784	1.289	206.017	6.830	212.847
1977	181.119	4.515	6.060	.388	15.249	1.521	202.428	6.424	208.852
1978	179.069	8.290	7.160	.275	15.145	.685	201.374	9.250	210.624
1979	173.802	7.527	8.004	.292	16.373	.552	198.179	8.371	206.550
1980[d] (est.)	167.004	7.832	7.663	.161	16.611	.486	191.278	8.479	199.757

[a]Figures revised from reports from previous years

[b]Military and government

[c]Military, government, and nonpropulsion uses

[d]Estimate for the year based on first 9 months

SOURCE: Department of Revenue, Motor Fuel Tax Returns

TABLE 4B. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: DIESEL[a]

(million gallons)

	Highway		Off Highway	Marine			Total		Grand Total
Year	Taxable	Exempt[b]	Exempt[c]	Taxable	Exempt-A[d]	Exempt-B[e]	Taxable	Exempt	
1971	34.995	71.769		20.843	2.737	NA	55.838	74.506	130.344
1972	28.723	55.054		20.823	7.007	NA	49.546	62.061	111.607
1973	24.706	89.109		21.426	13.041	5.586	46.132	107.736	153.868
1974	65.563	100.247		21.547	1.884	6.809	87.110	108.940	196.050
1975	132.835	71.166		21.799	7.403	9.156	154.634	87.725	242.359
1976	139.665	65.274		24.945	4.072	10.353	164.610	79.699	244.309
1977	98.704	45.162		32.217	11.719	NA	130.921	56.881	187.802
1978	101.598	54.050		41.869	10.116	NA	143.467	64.166	207.633
1979	56.595	39.477	81.483	53.167	6.325	NA	109.762	127.285	237.047
1980[f] (est.)	60.089	29.340	67.780	60.310	5.033	NA	120.399	102.153	222.552

[a]Figures revised from reports from previous years

[b]Military, government, and electric utility power generation

[c]Off-Highway diesel is diesel sold for space heating and power generation

[d]Military and government

[e]Nonpropulsion

[f]Estimate for the year based on first 9 months

SOURCE: Department of Revenue, Motor Fuel Tax Returns

TABLE 4C. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: JET FUEL[a]

(million gallons)

Year	Taxable[b]	Exempt[c]	Bonded[d]	Exempt and Bonded	Grand Total
1971	48.968	194.485	NA	194.485	243.453
1972	46.594	231.581	NA	231.581	278.175
1973	35.293	150.055	131.452	281.507	316.800
1974	79.647	144.386	116.939	261.375	341.022
1975	96.586	215.366	26.035	241.401	337.987
1976	95.488	189.734	32.765	222.499	317.987
1977	103.164	190.382	40.517	230.899	334.063
1978	113.006	220.789	33.117	253.906	366.912
1979	126.190	221.041	67.985	289.026	415.216
1980[e] (est.)	136.126	210.843	88.944	299.787	435.913

[a]Figures revised from reports from previous years

[b]Civilian domestic operations

[c]Military and international operations utilizing domestic fuel

[d]International operations utilizing foreign fuel

[e]Estimate for the year based on first 9 months

SOURCE: Department of Revenue, Motor Fuel Tax Returns

TABLE 4D. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: OTHER[a]

(million gallons)

Year	Taxable Highway	Taxable Marine	Total
1971	-	-	.848
1972	-	-	.469
1973	-	-	.249
1974	-	-	.904
1975	-	-	.794
1976	-	-	1.174
1977	-	-	.593
1978	-	-	29.228
1979	91.563	.328	91.821[b]
1980[c] (est.)	87.099	.160	87.259

[a]Almost all are turbine fuels that are essentially a type of diesel.

[b]Components do not sum to total due to small adjustment (-.070) which is not classified either as "Highway Other" or "Marine Other."

[c]Estimated based on data for first 9 months

SOURCE: Department of Revenue, Motor Fuel Tax Returns

TABLE 4E. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: TOTAL

(million gallons)

Year	Gasoline	Diesel	Other	Jet Fuel	Total	Diesel and Other (primarily diesel)
1971	129.905	130.344	.848	243.453	504.550	131.192
1972	158.811	111.607	.469	278.175	549.062	112.076
1973	153.253	153.868	.249	316.800	624.170	154.117
1974	162.783	196.050	.904	341.022	700.759	196.954
1975	194.764	242.359	.794	337.987	775.904	243.153
1976	212.847	244.309	1.174	317.987	776.317	245.483
1977	208.852	187.802	.593	334.063	731.310	188.395
1978	210.624	207.633	29.228	366.912	814.397	236.861
1979	206.550	237.047	91.821	415.216	950.634	328.868
1980 (est.)	199.757	222.522	87.259	435.913	945.481	309.811

SOURCE: Department of Revenue, Motor Fuel Tax Returns

TABLE 5A. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: GASOLINE
BARRELS OF CRUDE OIL EQUIVALENT

(annual million barrels)[a]

	Highway		Marine		Aviation		Total		Grand Total
Year	Taxable	Exempt	Taxable	Exempt	Taxable	Exempt	Taxable	Exempt	
1971	2.15	.28	.12	.00	.18	.06	2.46	.33	2.79
1972	2.41	.61	.10	.00	.20	.09	2.71	.70	3.41
1973	2.57	.32	.14	.00	.23	.04	2.94	.36	3.29
1974	2.77	.27	.14	.00	.28	.04	3.19	.31	3.50
1975	3.60	.16	.11	.00	.29	.03	4.00	.19	4.19
1976	4.01	.11	.12	.01	.30	.03	4.43	.15	4.58
1977	3.89	.10	.13	.01	.33	.03	4.35	.14	4.49
1978	3.85	.18	.15	.01	.33	.01	4.33	.20	4.53
1979	3.74	.16	.17	.01	.35	.01	4.26	.18	4.44
1980 (est.)	3.59	.17	.16	.00	.36	.01	4.11	.18	4.29

[a]Conversion assumes 1 barrel gasoline = 5.248 million btu.
(1 gallon gasoline x .0215 = 1 barrel crude oil equivalent)

See Table 4A for additional notes and source.

Components may not add to totals due to rounding.

TABLE 5B. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: DIESEL
BARRELS OF CRUDE OIL EQUIVALENT

(annual million barrels)[a]

	Highway		Off Highway	Marine			Total		Grand Total
Year	Taxable	Exempt	Exempt	Taxable	Exempt-A	Exempt-B	Taxable	Exempt	
1971	.83	1.72		.50	.07	NA	1.33	1.78	3.12
1972	.69	1.32		.50	.17	NA	1.18	1.48	2.67
1973	.59	2.13		.51	.31	.13	1.10	2.57	3.68
1974	1.57	2.40		.52	.05	.16	2.08	2.60	4.69
1975	3.17	1.70		.52	.18	.22	3.70	2.10	5.79
1976	3.34	1.56		.60	.10	.25	3.93	1.90	5.84
1977	2.36	1.08		.77	.28	NA	3.13	1.36	4.49
1978	2.43	1.29		1.00	.24	NA	3.43	1.53	4.96
1979	1.35	.94	1.95	1.27	.15	NA	2.62	3.04	5.67
1980 (est.)	1.44	.70	1.62	1.44	.12	NA	2.88	2.44	5.32

[a]Conversion assumes 1 barrel diesel = 5.825 million btu.
(1 gallon diesel x .0239 = 1 barrel crude oil equivalent)

See Table 4B for additional notes and source.

Components may not add to totals due to rounding.

TABLE 5C. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: JET FUEL
BARRELS OF CRUDE OIL EQUIVALENT

(annual million barrels)[a]

Year	Taxable	Exempt	Bonded	Exempt and Bonded	Grand Total
1971	1.13	4.47	NA	4.47	5.60
1972	1.07	5.33	NA	5.33	6.40
1973	.81	3.45	3.02	6.47	7.29
1974	1.83	3.32	2.69	6.01	7.85
1975	2.22	4.95	.60	5.55	7.78
1976	2.20	4.36	.75	5.12	7.32
1977	2.37	4.38	.93	5.31	7.69
1978	2.60	5.08	.76	5.84	8.44
1979	2.90	5.08	1.56	6.65	9.55
1980 (est.)	3.13	4.85	2.05	6.90	10.03

[a]Conversion assumes 1 barrel jet fuel = 5.604 million btu.
(1 gallon jet fuel x .023 = 1 barrel crude oil equivalent)

See Table 4C for additional notes and source.

Components may not add to totals due to rounding.

TABLE 5D. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: OTHER BARRELS OF CRUDE OIL EQUIVALENT

(annual million barrels)[a]

Year	Taxable Highway	Taxable Marine	Total
1971	-	-	.02
1972	-	-	.01
1973	-	-	.01
1974	-	-	.02
1975	-	-	.02
1976	-	-	.03
1977	-	-	.01
1978	-	-	.70
1979	2.19	.01	2.19
1980 (est.)	2.08	.00	2.09

[a]Conversion assumes 1 barrel diesel = 5.825 million btu. (1 gallon diesel x .0239 = 1 barrel crude oil equivalent)

See Table 4D for additional notes and source.

Components may not add to totals due to rounding.

TABLE 5E. ALASKAN CONSUMPTION OF MOTOR VEHICLE FUELS: TOTAL BARRELS OF CRUDE OIL EQUIVALENT

(annual million barrels)

Year	Gasoline	Diesel	Other	Jet Fuel	Total	Diesel and Other (primarily diesel)
1971	2.79	3.12	.02	5.60	11.53	3.14
1972	3.41	2.67	.01	6.40	12.49	2.68
1973	3.29	3.68	.01	7.29	14.27	3.69
1974	3.50	4.69	.02	7.85	16.06	4.71
1975	4.19	5.79	.02	7.78	17.78	5.81
1976	4.58	5.84	.03	7.32	17.77	5.87
1977	4.49	4.49	.01	7.69	16.68	4.50
1978	4.53	4.96	.70	8.44	18.63	5.66
1979	4.44	5.67	2.19	9.55	21.85	7.86
1980 (est.)	4.29	5.32	2.09	10.03	21.73	7.41

See Table 4E for additional notes and source.

Recent trends in petroleum liquids use are as follows:

1. Rapid increase in jet fuel consumption in recent years.
2. Rapid increase in diesel consumption associated with pump station requirements on Alyeska pipeline.
3. Moderation in growth of fuel oil use for space heating and electricity generation.
4. Decline in consumption of gasoline and diesel fuel for vehicle transportation in post-Alyeska pipeline construction years.

TABLE 6A. ALASKA PETROLEUM LIQUIDS CONSUMPTION NOT REPORTED AS VEHICLE TRANSPORTATION FUEL

(million barrels of product)

Year	Oil Pipeline	Space Heat	Electric Power Generation	Total
1970	0	--	--	--
1971	0	--	--	--
1972	0	--	--	--
1973	0	--	--	--
1974	0	--	--	--
1975	0	--	--	--
1976	0	3.674	2.340	6.014
1977	.73	3.7	2.57	7.0
1978	2.25	4.0	2.70	8.95
1979	2.58	4.1	2.79	9.47
1980 (est.)	2.95	4.2	2.9	10.05

SOURCES: (1976) Goldsmith and Lane, Oil and Gas Consumption in Alaska: 1976 to 2000, prepared for the Alaska Royalty Oil and Gas Development Advisory Board and the 1978 Alaska State Legislature, 1978.

(1977 to date) Oil Pipeline - Alyeska Pipeline Service Company; Space Heat - based on growth rate of Anchorage gas utility sales; Electric Utility - based on growth rate of electricity net generation state-wide, taken from Alaska Power Administration internal worksheets.

TABLE 6B. ALASKA PETROLEUM LIQUIDS CONSUMPTION NOT REPORTED AS VEHICLE TRANSPORTATION FUEL

(million barrels of crude oil equivalent)

Year	Oil Pipeline	Space Heat	Electric Power Generation	Total
1970	0	--	--	--
1971	0	--	--	--
1972	0	--	--	--
1973	0	--	--	--
1974	0	--	--	--
1975	0	--	--	--
1976	0	3.674	2.340	6.014
1977	.73	3.7	2.57	7.0
1978	2.25	4.0	2.70	8.95
1979	2.58	4.1	2.79	9.47
1980 (est.)	2.95	4.2	2.9	10.05

[a]Conversion assumes 1 barrel diesel = 5.825 million btu.

SOURCE: See Table 6A.

II. OIL AND NATURAL GAS CONSUMPTION PROJECTED TO 2000

II.A. Summary

By 2000, it is possible that consumption of natural gas (not including reinjection) could increase by 100 percent from 230 to 459 million mcf annually. Consumption of petroleum liquids could also double from 28.1 to 58.3 million barrels annually (Table 7). Summing annual consumption estimates between 1981 and 2000 results in total natural gas consumption of 8,167 million mcf (8.1 trillion cubic feet) and petroleum liquids consumption of 929 million barrels (.9 billion barrels).

The most rapid growth is likely in industrial use of petroleum liquids which is dominated by the royalty oil refinery use of liquids. Electric utility generation using petroleum liquids should also continue to increase rapidly because of the unavailability of alternative generation modes in many parts of the state combined with continued population expansion. This continued population growth should also contribute to a rapid increase in the use of liquid fuels for transportation and for space heating although the growth rate for the latter will be more moderate.

Continued consumer preference for natural gas as a space heating fuel in the Anchorage area combined with continued population growth will result in greatly increased use of gas for this purpose. Industrial use of gas could double, primarily the result of construction of a large LNG

TABLE 7A. 2000 PROJECTION OF ALASKA OIL AND GAS CONSUMPTION

Liquids = million barrels
Natural Gas = million mcf

	1980	2000	20-Year Total (1981 to 2000)
Vehicle Transportation			
Liquids	18.0	32	500
Natural Gas	0	0	0
Utility Electricity Generation			
Liquids	2.9	6.9	100
Natural Gas	28	43	785
Space Heat			
Liquids	4.2	7.4	116
Natural Gas	14	25	390
Industrial Use[a]			
Liquids	3.0	12	213
Natural Gas	188	383	6,992
Total			
Liquids	28.1	58.3	929
Natural Gas	230	459	8,007

[a]For petroleum liquids in 1980, this includes oil pipeline-related fuel use. For natural gas in 1980, this includes all uses except consumption through gas utilities and reinjection (which is primarily deferred consumption).

TABLE 7B. 2000 PROJECTION OF ALASKA OIL AND GAS CONSUMPTION

(million barrels of crude oil equivalent)

	1980	2000	20-Year Total (1981 to 2000)
Vehicle Transportation			
Liquids	17.4	31	483
Natural Gas	0	0	0
Utility Electricity Generation			
Liquids	2.8	7	97
Natural Gas	4.9	8	138
Space Heat			
Liquids	4.1	7	112
Natural Gas	2.5	4	69
Industrial Use			
Liquids	2.9	12	206
Natural Gas	33.1	67	1,231
Total			
Liquids	27.1	56	897
Natural Gas	40	81	1,409

Conversion factors: .1760 for gas; .966 for liquids.

facility to ship gas to California. Use of gas for utility electricity generation will expand at a more moderate rate as utilities are forced to switch to alternative generating modes to meet continued load growth.

II.B. Projection Assumptions

This projection of oil and gas consumption to 2000 is quite simple and based upon a limited number of assumptions. They are as follows:

- Population in Alaska grows to 700 thousand by 2000 as a result of the growth of basic sector industries and state government activity which stimulates the private economy. This is consistent with the moderate economic projection scenario which appears in the study Electric Power Consumption for the Railbelt, ISER, 1980.

- Per capita use of vehicle transportation fuels remains constant in the aggregate over time. Thus, the combination of high prices and fuel economy standards (which apply primarily to gasoline and diesel consumption) reduces consumption to the same extent that increasing real incomes and increasing international air traffic increases consumption.

- The space heating mode split remains constant through the projection period. Gas is the preferred fuel for the majority of new consumers in the Anchorage region; and fuel oil, elsewhere. New consumers utilize fuel at the same rate as existing consumers, thus balancing the effects of rising real incomes and rising real energy prices.

- New electricity generation in the railbelt until 1990 is provided by gas in Anchorage and oil in Fairbanks. Subsequently, new load is served by some alternative; but the amount provided by oil and gas does not decline. For the rest of the state, liquid fuel use for

electricity generation grows continuously for the next twenty years. Railbelt consumption growth is 4.5 percent annually, consistent with the above-mentioned study. The annual growth rate for the rest of the state is 5 percent. (The Fairbanks region is assumed to account for 25 percent of petroleum liquids consumption for electricity generation.)

- Industrial consumption specifically includes the large projects listed in Table 8. The new projects--LNG to California, the gas pipeline, and the Alaskan royalty oil refinery--all begin operation in the mid-1980s so that the time profile of industrial consumption rises rapidly to a level about double present use.

- All industrial projects continue at projected annual consumption levels through the year 2000 independent of currently dedicated gas supplies or presently projected supplies of oil.

- Military consumption patterns follow those of the state in general.

II.C. Potential for Error in Projection

Actual consumption of oil and gas in future years could differ considerably from these projections for many reasons.

Industrial consumption is the largest projected end use for gas and subject to the most uncertainty. Table 8 shows what projects have been included in the projection and their average annual consumption rates. Changing the assumptions about which large industrial projects will actually be built and their timing could easily change the projection of total natural gas consumption in 2000 by 10-to-20 percent. Industrial

TABLE 8. POTENTIAL AVERAGE ANNUAL DEMAND FOR OIL AND GAS IN VARIOUS INDUSTRIAL PROCESSES

USE	OIL (million barrels)	GAS (million mcf)
Included in Projection		
Existing Consumption		
LNG to Japan	-	50-88
Oil and Gas Production	-	64
Ammonia-Urea	-	55
Oil Pipeline	3	12
Military (gas sales only)	-	5
New Consumption (start date)		
Alaskan Royalty Oil Refinery (1984)	9	-
Gas Pipeline (1985)	-	7
LNG to California (1986)	-	160
Not Included in Projection		
Aluminum Smelting	-	20-53
Iron Ore Processing	-	29
Methanol Plant	-	24
Copper Processing	-	22
Polyethylene Plant	-	6

SOURCE: Goldsmith, Scott and Tom Lane. Oil and Gas Consumption in Alaska 1976-2000. Report for Alaska Royalty Oil and Gas Development Advisory Board and Alaska State Legislature, 1978, and author's estimates.

use of oil is much smaller as a percentage but is also highly dependent upon the assumptions made about particular projects.

The level of transportation use of liquid fuels is dependent upon a large number of factors. Jet fuel consumption depends primarily on military requirements and international movements. Domestic flights account for the smallest portion of use. Gasoline and diesel use are both heavily dependent upon population and consumption per capita. Use per capita will be influenced positively by increases in real incomes and negatively by higher prices and fuel economy standards in new motor vehicles. Diesel will also be a function of large construction project activity (pipelines, for example) and to a lesser extent of growth of the fishing industry.

Use of fuels for space heating is subject to considerable uncertainty over the next twenty years because of the possibility of the substitution of electricity, generated by hydropower, for oil and gas in the railbelt. Alternatively, there is the possibility of substituting natural gas, from Prudhoe Bay, for liquid fuels in the Fairbanks market. In addition to this uncertainty concerning the mode split, space heating requirements are a function of population, income, and the conservation response to higher energy prices.

Projecting the use of fuels for electricity generation is also subject to uncertainty related to choice of mode split. The ability of Anchorage to provide for expanding electricity load with natural gas

and to continue to use gas for existing load is partially dependent upon the economics of alternatives, but also upon government regulations on the use of gas to generate electricity. For Fairbanks, economics is more clearly a determinant of the potential for switching toward coal, although government regulation is also a factor there. The possible construction of the hydroelectric generating capability adds another alternative generating mode to the possible substitutes for oil and gas. Electricity consumption, itself, is related to population, income, and price variables.

III. PRESENT OIL AND GAS SUPPLY

Estimated reserves[1] of oil and gas in Alaska are presented in Tables 9 and 10. Crude oil reserves total about 8,577 million barrels with about 1,064.8 million barrels comprising the state's royalty portion. Natural gas reserves amount to about 32,791 billion cubic feet (BCF) with 3,876.1 comprisng the state's royalty.

No new reserves were discovered in 1979, but an increase in the gas reserves of the Prudhoe Bay field may be noted in Table 10. The January 1979 volume estimate of 21,000 BCF included only gas found in the gas cap. The three-dimensional reservoir model and two years of oil production history have increased knowledge about the Prudhoe Bay field and revealed the potential for additional reserves of gas in solution with the oil.

The Alaska Oil and Gas Conservation Commission utilizes average reservoir pressures and corresponding volumes of production to estimate natural gas reserves and production history curves to estimate oil reserves in the Cook Inlet. The data are continually changing and improving throughout the life of a field, and, consequently, the reserve estimates also change and improve.

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[1] Reserves are defined as oil or natural gas resources that have been discovered and developed, that are producible, but that have not yet been removed from the reservoir.

TABLE 9. ESTIMATED REMAINING RECOVERABLE OIL RESERVES IN ALASKA AS OF JANUARY 1, 1980

Field	Total (million BBLS)	State Royalty (percent)	State Royalty (million BBLS)
Beaver Creek*	1	0	
Granite Point*	21	12.5	2.6
McArthur River*	118	12.5	14.8
Middle Ground Shoal*	36	0	
Prudhoe Bay*	8,375	12.5	1,046.9
Swanson River*	22	0	
Trading Bay*	4	12.5	.5
TOTAL	8,577		1,064.8

*Producing oil field

SOURCE: The 1979 Statistical Report published by the Oil and Gas Conservation Commission.

TABLE 10. ESTIMATED REMAINING RECOVERABLE NATURAL GAS RESERVES IN ALASKA AS OF JANUARY 1, 1980

Field	Total (BCF)	State Royalty (percent)	State Royalty (BCF)
Albert Kaloa	0	0	
Beaver Creek*	240	0	
Beluga River*	767	7.99	61.3
Birch Hill	11	0	
Falls Creek	13	0	
Ivan River	101	0	
Kenai*	1,313	**	43.0
Lewis River	90	0	
McArthur River*	78	12.5	9.8
Moquawkie	0	0	
Nicolai Creek*	17	12.5	2.1
North Cook Inlet*	1,074	12.5	134.3
North Fork	12	0	
North Middle Ground Shoal	0	12.5	
Prudhoe Bay	29,000	12.5	3,625
South Barrow*	25	0	
Sterling*	23	2.72237	.6
Swanson River	0	0	
West Foreland	20	0	
West Fork*	7	0	
TOTAL	32,791		3,876.1

*Producing gas field

**Due to federal leases in the Kenai gas field, the effective state royalty for the Kenai Unit and the Kenai Deep producing zones are 3.61635 percent and 1.14069 percent, respectively. Royalty reserves are 41.9 BCF and 1.1 BCF, respectively.

SOURCE: The 1979 Statistical Report published by the Oil and Gas Conservation Commission.

Prudhoe Bay continues to dominate the oil and gas reserves picture. Total Cook Inlet oil reserves comprise only about 2 percent of the total known reserves in the state; while Cook Inlet royalty oil reserves total about 2 percent of the total state royalties known to exist at this time.

The same situation occurs with the gas reserves. Cook Inlet gas reserves comprise about 12 percent of the total reserves, and royalty gas in Cook Inlet totals about 7 percent of the total state royalty gas.

IV. SURPLUS OIL AND GAS

A comparison of projected consumption levels with current estimated remaining recoverable reserves indicates that presently identifiable Alaskan needs for both petroleum liquids and natural gas could be met by Alaskan resources through the year 2000 (Table 11).

State royalty oil could meet Alaskan liquid fuel requirements through 2000. Because of population growth royalty oil supply will exceed demand in early years; later in the 1990s, the reverse will be the case.

State royalty gas, from both Cook Inlet and Prudhoe Bay, is insufficient to meet total projected instate gas requirements through 2000. In addition, total present Cook Inlet reserves are not sufficient to meet total Cook Inlet gas market demand through 2000 as projected.

TABLE 11. SURPLUS OIL AND GAS CALCULATION

	Liquid Petroleum (million barrels)						Natural Gas (million mcf)					
	Statewide		North Slope		Cook Inlet		Statewide		North Slope		Cook Inlet	
	Total	State Royalty	Total	State Royalty	Total	State Royalty	Total	State Royalty	Total	State Royalty	Total	State Royalty
Recoverable Reserves as of January 1, 1980	8,577	1,065	8,375	1,047	202	18	32,791	3,876	29,025	3,625	3,766	251
Estimated Production during 1980[a]	585	72	548	69	37	3	230	27	53	7	177	12
Item: Estimated Alaskan Consumption during 1980	28	--	--	--	--	--	230	27	53	7	177	12
Estimated Remaining Recoverable Reserves as of January 1, 1981[b]	7,992	993	7,827	978	165	15	32,561	3,849	28,972	3,618	3,589	239
Estimated Cumulative Alaskan Consumption from 1981 to 2000	929	--	--	--	--	--	8,007	--	--	--	--	--

[a] Authors' estimates

[b] Assumes no reserve additions during 1980

APPENDIX A. DATA SOURCES

Data on current consumption is derived from the following documents:

Petroleum Liquids

State of Alaska, Department of Revenue. Motor Fuel Tax Returns (monthly).

U.S. Department of Energy. Prime Suppliers Monthly Report (EIA-25), compiled by State of Alaska, Department of Commerce and Economic Development, Division of Energy and Power Development.

U.S. Department of Interior, Alaska Power Administration. Alaska Electric Power Statistics (worksheets).

Natural Gas

State of Alaska, Department of Natural Resources, Division of Oil and Gas Conservation. Monthly Report of Gas Disposition.

_____. Kenai Gas Sales (monthly).

Alaska Public Utilities Commission. Annual Financial Reports of Alaska Gas and Service Company, Kenai Utility Service Corporation, Alaska Pipeline Company.

The U.S. Department of Energy compiles information on energy consumption in Alaska. This source of information does not at this time appear to be of such a consistent or reliable quality as to warrant its use for policy decisions. The most recent compilation for Alaska is reproduced on the following pages. The source of this information is U.S. Department of Energy, Energy Information Administration, Energy Statistics Branch, State Energy Data Report, April 1980, pp. 31-37.

Consumption of Energy by Type, State of Alaska

TRILLION BTU

Year	Total Coal	Natural Gas (Dry)	Petroleum: Asphalt	Aviation Gasoline	Distillate Fuel	Jet Fuel	Kerosene	LPG[2]	Lubricants	Motor Gasoline	Residual Fuel	Road Oil	All Other Petroleum	Total Petroleum	Nuclear Power	Hydroelectric Power[1]	Geothermal Power[1]	Wood and Waste[1]	Total Energy Consumed
1960	8.485	2.034	0.312	5.581	15.628	12.127	0.511	0.303	0.511	14.666	4.440	0.000	4.021	58.101	0.000	0.000	0.000	0.000	73.869
1961	14.005	2.390	0.556	5.992	16.679	14.322	0.237	0.524	0.495	16.680	4.072	0.000	4.898	64.455	0.000	0.000	0.000	0.000	85.042
1962	16.745	4.048	0.469	5.335	16.952	17.128	0.136	0.382	0.520	14.576	4.474	0.000	4.330	64.322	0.000	0.000	0.000	0.000	90.335
1963	15.779	5.677	0.589	4.068	17.897	17.476	0.164	0.461	0.520	13.909	4.668	0.000	5.130	64.882	0.000	3.410	0.000	0.000	88.806
1964	15.465	6.954	0.791	3.584	20.361	18.120	0.047	0.606	0.546	13.868	5.011	0.000	4.891	67.825	0.000	3.374	0.000	0.000	91.694
1965	12.393	7.837	0.878	3.034	21.439	18.217	0.057	0.649	0.562	16.003	5.548	0.000	4.953	71.339	0.000	3.655	0.000	0.000	92.573
1966	21.225	12.687	1.644	2.505	22.980	22.200	0.046	0.703	0.584	10.059	6.256	0.003	4.307	71.286	0.000	3.293	0.000	0.000	105.460
1967	24.418	12.269	0.832	3.474	25.018	27.305	0.040	0.747	0.525	14.089	5.283	0.000	5.360	82.773	0.000	3.786	0.000	0.000	119.076
1968	21.147	18.092	0.740	3.356	27.755	30.705	0.051	0.794	0.578	11.583	5.729	0.015	5.190	86.495	0.000	3.781	0.000	0.000	124.984
1969	17.443	44.050	0.963	3.071	28.361	38.051	0.040	0.886	0.582	12.617	5.634	0.006	5.276	95.486	0.000	3.562	0.000	0.000	156.103
1970	17.020	65.701	1.808	2.297	29.601	38.908	0.187	1.111	0.593	13.766	6.501	0.009	5.227	100.008	0.000	3.807	0.000	0.000	180.631
1971	18.637	69.805	1.949	1.995	37.000	43.598	0.187	1.302	0.588	14.942	6.557	0.020	5.566	113.705	0.000	3.807	0.000	0.000	199.371
1972	16.552	76.674	2.116	2.031	36.158	46.037	0.119	1.473	0.630	19.357	7.331	0.052	6.251	121.560	0.000	3.594	0.000	0.000	209.951
1973	17.641	64.398	1.580	2.077	37.187	42.567	0.102	1.732	0.706	18.794	6.608	0.042	6.332	115.725	0.000	2.973	0.000	0.000	191.571
1974	16.284	64.349	1.397	2.386	38.393	42.861	0.595	1.373	0.676	18.619	6.903	0.241	6.706	120.150	0.000	3.407	0.000	0.000	195.325
1975	18.577	86.564	1.976	2.337	40.460	42.347	0.699	1.567	0.598	21.954	6.941	0.139	7.027	126.045	0.000	3.713	0.000	0.000	226.546
1976	16.862	91.922	1.915	1.683	55.437	41.874	0.365	2.524	0.665	24.675	8.437	0.192	8.647	146.414	0.000	3.978	0.000	0.000	248.970
1977	12.858	118.723	2.191	1.854	59.315	44.798	0.490	3.001	0.695	25.449	10.927	0.205	10.666	159.592	0.000	5.343	0.000	0.000	286.836
1978	4.598	147.785	2.065	2.223	61.576	46.296	0.465	3.699	0.747	23.811	16.315	0.016	11.080	168.293	0.000	4.924	0.000	0.000	316.042

PHYSICAL UNITS

Year	Total Coal	Natural Gas (Dry)	Petroleum: Asphalt	Aviation Gasoline	Distillate Fuel	Jet Fuel	Kerosene	LPG[2]	Lubricants	Motor Gasoline	Residual Fuel	Road Oil	All Other Petroleum	Total Petroleum	Nuclear Power	Hydroelectric Power[1]	Geothermal Power[1]	Wood and Waste[1]
	Thousand Short Tons	Billion Cubic Feet	Thousand Barrels												Million Kilowatt Hours			
1960	318	1965	47	1106	2683	2251	90	76	84	2792	706	0	622	10457	0	0	0	0
1961	525	2222	84	1187	2863	2640	42	131	82	3175	648	0	756	11607	0	0	0	0
1962	628	3911	74	1057	2910	3144	24	95	86	2775	712	0	722	11598	0	0	0	0
1963	619	5506	89	806	3072	3208	29	115	86	2648	743	0	929	11724	0	325	0	0
1964	624	6738	119	710	3495	3325	8	151	90	2640	797	0	933	12269	0	322	0	0
1965	513	7594	132	601	3680	3327	10	162	93	3047	882	0	962	12886	0	350	0	0
1966	845	12282	248	496	3945	4031	8	175	96	1915	995	0	976	12886	0	316	0	0
1967	959	11889	125	688	4295	4955	7	186	87	2682	856	0	1127	15009	0	363	0	0
1968	842	17548	111	665	4765	5573	9	198	95	2205	911	2	1181	15715	0	364	0	0
1969	710	42726	145	608	4869	6848	7	221	96	2402	1055	1	1316	17569	0	341	0	0
1970	725	63726	272	455	5082	6979	33	277	98	2621	1034	1	1321	18173	0	363	0	0
1971	787	67706	294	395	6352	7806	33	325	97	2844	1043	3	1407	20659	0	363	0	0
1972	702	74658	319	402	6207	8227	21	367	104	3685	1166	8	1599	22102	0	346	0	0
1973	741	63073	238	411	6384	7604	18	432	116	3197	1051	6	1528	20984	0	286	0	0
1974	712	62874	210	473	6591	7661	105	342	111	3545	1098	36	1651	21830	0	326	0	0
1975	804	84751	298	463	6946	7567	123	391	99	4179	1104	21	1752	22942	0	357	0	0
1976	734	90121	289	333	9517	7476	64	629	110	4697	1342	29	2114	26601	0	383	0	0
1977	577	116278	330	367	10183	7991	86	748	115	4845	1738	31	2445	28880	0	512	0	0
1978	276	145025	311	440	10571	8258	82	922	123	4533	2595	2	2655	30493	0	472	0	0

[1] Includes industrial and utility production, and net imports of electricity.
[2] Consumed at utilities to produce electricity.
[3] Liquefied petroleum gases, including ethane.
Note: Totals may not equal sum of components due to independent rounding.
Note: Totals do not include wood derived fuel consumed by the pulp and paper industry which amounted to an estimated 1.0 quadrillion Btu in the United States in 1978. Also excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at the electric utilities.

Consumption of Energy by End-Use Sector, State of Alaska
Trillion Btu

Year	Residential		Commercial		Industrial		Transportation		Electric Utilities	Total Energy Consumed
	Without Electricity Distributed	With Electricity Distributed[1]	Without Electricity Distributed	With Electricity Distributed[1]	Without Electricity Distributed	With Electricity Distributed[1]	Without Electricity Distributed	With Electricity Distributed[1]		
1960	3.017	5.724	17.225	19.377	18.403	19.285	29.448	29.477	0.527	73.863
1961	3.388	6.057	19.156	21.276	24.551	25.421	33.258	33.288	0.497	86.042
1962	3.829	6.470	16.676	18.774	28.110	28.970	36.089	36.119	0.410	90.333
1963	3.924	6.554	17.172	19.264	27.100	27.957	35.005	35.032	6.548	88.806
1964	4.573	7.497	18.022	20.375	26.928	27.794	35.400	35.427	8.695	91.094
1965	4.933	8.318	19.100	22.174	23.619	24.298	37.756	37.782	9.817	92.573
1966	5.575	9.395	16.979	20.467	35.350	36.080	39.488	39.517	11.100	105.460
1967	5.879	9.907	19.474	23.287	39.057	39.784	46.970	46.998	12.767	119.076
1968	6.448	10.996	19.159	23.515	40.093	40.870	49.572	49.602	14.243	124.984
1969	8.378	13.546	24.663	29.475	54.344	55.221	57.831	57.861	16.325	156.103
1970	10.088	16.253	27.095	32.659	52.369	53.552	78.134	78.165	18.852	180.631
1971	11.952	19.354	32.317	38.868	52.998	54.239	85.878	85.910	21.808	199.371
1972	12.830	20.147	33.394	40.303	63.247	64.690	84.767	84.811	24.142	209.951
1973	10.193	18.212	30.847	38.892	60.508	61.948	72.473	72.519	26.717	191.571
1974	9.197	18.114	31.376	40.040	59.944	61.405	75.714	75.767	27.959	195.325
1975	15.278	25.873	32.393	49.106	74.926	80.650	79.874	79.917	32.426	226.546
1976	16.462	28.006	34.628	43.314	82.887	88.807	88.757	88.844	36.500	248.970
1977	16.927	29.605	37.283	46.897	109.558	116.547	93.743	93.788	39.004	286.836
1978	18.955	32.043	40.053	50.071	128.103	135.347	98.556	98.581	40.033	316.042

[1] Including electrical energy losses incurred in the generation and transmission of electricity.

Note: Totals may not equal sum of components due to independent rounding.

Note: Totals do not include wood derived fuel consumed by the pulp and paper industry which amounted to an estimated 1.0 quadrillion Btu in the United States in 1978. Also excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy other than that consumed at the electric utilities.

Consumption of Energy by the Residential Sector, State of Alaska

TRILLION BTU

Year	Coal			Natural Gas (Dry)	Petroleum				Electricity Sales	Electrical Energy Losses[1]	Total Energy Consumed
	Bituminous Coal and Lignite	Anthracite	Total Coal		Distillate Fuel	Kerosene	LPG[2]	Total Petroleum			
1960	0.598	0.000	0.598	0.176	1.992	0.000	0.251	2.243	0.774	1.934	5.724
1961	0.597	0.000	0.597	0.195	2.086	0.052	0.458	2.596	0.774	1.896	6.057
1962	0.715	0.000	0.715	0.556	2.208	0.017	0.334	2.559	0.774	1.867	6.470
1963	0.463	0.000	0.463	0.706	2.306	0.035	0.414	2.754	0.774	1.856	6.564
1964	0.362	0.000	0.362	1.078	2.544	0.047	0.541	3.133	0.864	2.060	7.497
1965	0.324	0.000	0.324	1.483	2.488	0.057	0.581	3.125	0.996	2.390	8.318
1966	0.411	0.000	0.411	1.853	2.686	0.046	0.579	3.310	1.120	2.700	9.395
1967	0.276	0.000	0.876	2.021	2.776	0.040	0.667	3.482	1.187	2.841	9.207
1968	0.309	0.000	0.309	2.364	3.015	0.045	0.715	3.775	1.341	3.207	10.996
1969	0.301	0.000	0.301	4.715	2.799	0.034	0.529	3.362	1.519	3.648	13.546
1970	0.215	0.000	0.215	6.404	2.762	0.108	0.600	3.469	1.798	4.368	16.253
1971	0.190	0.000	0.190	7.107	3.852	0.108	0.696	4.656	2.155	5.247	19.354
1972	0.243	0.000	0.243	8.621	3.133	0.074	0.759	3.966	2.143	5.174	20.147
1973	0.130	0.000	0.130	5.124	3.769	0.057	1.113	4.939	2.342	5.677	18.212
1974	0.148	0.000	0.148	4.263	3.649	0.437	0.701	4.786	2.574	6.343	18.114
1975	0.150	0.000	0.150	10.601	3.470	0.517	0.540	4.528	3.063	7.533	25.873
1976	0.124	0.000	0.124	11.124	4.285	0.168	0.760	5.214	3.355	8.188	28.006
1977	0.126	0.000	0.126	11.496	4.587	0.248	0.470	5.304	3.655	9.024	29.605
1978	0.000	0.000	0.000	12.381	5.465	0.227	0.902	6.594	3.793	9.296	32.043

PHYSICAL UNITS

Year	Coal			Natural Gas (Dry)	Petroleum				Electricity Sales
	Bituminous Coal and Lignite	Anthracite	Total Coal		Distillate Fuel	Kerosene	LPG[2]	Total Petroleum	
	Thousand Short Tons			Billion Cubic Feet	Thousand Barrels				Million Kilowatt Hours
1960	22	0	22	170	342	0	63	405	227
1961	22	0	22	188	358	9	114	481	227
1962	27	0	27	537	379	3	83	465	227
1963	17	0	17	685	396	6	103	505	227
1964	14	0	14	1045	437	8	135	580	253
1965	12	0	12	1437	427	10	145	582	292
1966	15	0	15	1794	461	8	144	613	328
1967	14	0	14	1958	477	7	166	650	348
1968	12	0	12	2293	518	8	178	704	393
1969	11	0	11	4573	480	6	132	618	445
1970	8	0	8	6211	474	19	149	643	527
1971	7	0	7	6893	661	19	174	854	631
1972	9	0	9	8394	538	13	189	740	628
1973	5	0	5	5024	647	10	278	935	686
1974	6	0	6	4153	626	77	175	878	754
1975	6	0	6	10393	596	91	135	822	898
1976	5	0	5	10917	736	30	190	955	983
1977	5	0	5	11282	787	44	117	948	1071
1978	0	0	0	12166	938	40	225	1203	1112

[1] Incurred in the generation and transmission of electricity.
[2] Liquefied petroleum gases, including ethane.
Note: Totals may not equal sum of components due to independent rounding.
Note: Excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy.

Consumption of Energy by the Commercial Sector, State of Alaska

TRILLION BTU

Year	Coal			Natural Gas (Dry)	Petroleum							Electricity Sales	Electrical Energy Losses[1]	Total Energy Consumed
	Bituminous Coal and Lignite	Anthracite	Total Coal		Asphalt	Distillate Fuel	LPG[2]	Motor Gasoline	Residual Fuel	Road Oil	Total Petroleum			
1960	1.110	0.000	1.110	0.000	0.312	7.495	0.028	6.703	1.578	0.000	16.115	0.615	1.537	19.377
1961	1.109	0.000	1.109	0.129	0.555	7.849	0.051	8.022	1.448	0.000	17.925	0.614	1.606	21.276
1962	1.327	0.000	1.327	0.019	0.489	8.307	0.037	5.434	1.061	0.000	15.330	0.614	1.483	18.774
1963	0.861	0.000	0.861	1.664	0.569	8.673	0.046	4.496	0.843	0.000	14.647	0.615	1.477	19.264
1964	0.672	0.000	0.672	1.987	0.791	9.571	0.060	4.183	0.758	0.000	15.364	0.696	1.658	20.376
1965	0.602	0.000	0.602	2.343	0.878	9.360	0.065	4.574	1.279	0.000	16.155	0.904	2.170	22.174
1966	0.763	0.000	0.763	2.647	1.644	10.104	0.064	0.401	1.353	0.003	13.569	1.023	2.466	20.467
1967	0.699	0.000	0.699	2.829	0.832	10.443	0.074	3.264	1.352	0.000	15.966	1.123	2.690	23.287
1968	0.574	0.000	0.574	4.859	0.740	11.344	0.079	1.467	0.082	0.015	13.726	1.284	3.072	23.515
1969	0.559	0.000	0.559	11.360	0.963	10.528	0.059	1.050	0.138	0.006	12.744	1.415	3.397	29.475
1970	0.399	0.000	0.399	12.907	1.808	10.390	0.067	1.294	0.220	0.009	13.789	1.622	3.942	32.659
1971	0.353	0.000	0.353	14.698	1.949	14.491	0.077	0.591	0.138	0.020	17.266	1.907	4.644	38.868
1972	0.452	0.000	0.452	16.443	2.116	11.786	0.084	2.335	0.126	0.052	16.499	2.023	4.885	40.303
1973	0.241	0.000	0.241	12.523	1.580	14.178	0.124	2.078	0.082	0.042	18.083	2.350	5.695	38.892
1974	0.275	0.000	0.275	13.421	1.397	13.727	0.078	2.169	0.069	0.241	17.680	2.501	6.163	40.040
1975	0.278	0.000	0.278	14.703	1.976	13.055	0.060	2.182	0.000	0.139	17.412	2.229	5.483	40.106
1976	0.231	0.000	0.231	14.461	1.915	16.120	0.084	1.526	0.000	0.192	19.836	2.554	6.232	43.314
1977	0.235	0.000	0.235	14.941	2.191	17.254	0.052	2.505	0.000	0.205	22.207	2.771	6.842	46.897
1978	0.000	0.000	0.000	15.451	2.055	20.561	0.100	1.860	0.000	0.016	24.601	2.903	7.115	50.071

PHYSICAL UNITS

Year	Coal			Natural Gas (Dry)	Petroleum							Electricity Sales
	Bituminous Coal and Lignite	Anthracite	Total Coal		Asphalt	Distillate Fuel	LPG[2]	Motor Gasoline	Residual Fuel	Road Oil	Total Petroleum	
	Thousand Short Tons			Billion Cubic Feet	Thousand Barrels							Million Kilowatt Hours
1960	42	0	42	0	47	1287	7	1276	251	0	2868	180
1961	42	0	42	118	84	1347	13	1527	230	0	3201	180
1962	50	0	50	18	74	1426	9	1034	169	0	2713	180
1963	32	0	32	1614	89	1489	11	856	134	0	2579	180
1964	25	0	25	1925	119	1643	15	796	121	0	2694	204
1965	22	0	22	2270	132	1607	16	871	203	0	2829	265
1966	29	0	29	2562	248	1735	16	76	215	0	2290	300
1967	26	0	26	2722	125	1793	18	621	215	0	2773	329
1968	21	0	21	4713	111	1947	20	279	13	2	2373	376
1969	21	0	21	11018	145	1807	15	200	22	1	2190	415
1970	15	0	15	12519	272	1784	17	246	35	1	2355	475
1971	13	0	13	14256	294	2488	19	112	22	3	2938	559
1972	17	0	17	16011	319	2023	21	444	20	8	2836	593
1973	9	0	9	12227	238	2434	31	396	12	6	3118	689
1974	11	0	11	13106	210	2357	19	413	11	36	3047	733
1975	11	0	11	14416	298	2241	15	415	0	21	2990	653
1976	9	0	9	14191	289	2767	21	290	0	29	3396	748
1977	9	0	9	14554	330	2962	13	477	0	31	3813	812
1978	0	0	0	15258	311	3530	25	364	0	2	4222	851

[1] Incurred in the generation and transmission of electricity.
[2] Liquefied petroleum gases, including ethane.
Note: Totals may not equal sum of components due to independent rounding.
Note: Excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy.

Consumption of Energy by the Industrial Sector, State of Alaska

TRILLION BTU

Year	Coal: Bituminous Coal and Lignite	Coal: Anthracite	Coal: Total Coal	Natural Gas (Dry)	Petroleum: Distillate Fuel	Petroleum: Jet Fuel	Petroleum: Kerosene	Petroleum: LPG[2]	Petroleum: Lubricants	Petroleum: Motor Gasoline	Petroleum: Residual Fuel	Petroleum: Other Petroleum Products	Petroleum: Total Petroleum	Hydroelectric Power	Electricity Sales	Electrical Energy Losses[1]	Total Energy Consumed
1960	6.660	0.000	6.660	1.856	2.485	0.000	0.511	0.024	0.092	0.000	2.754	4.021	9.887	0.000	0.252	0.630	19.285
1961	12.242	0.000	12.242	1.934	2.716	0.000	0.185	0.015	0.089	0.000	2.471	4.898	10.375	0.000	0.252	0.618	25.421
1962	14.643	0.000	14.643	3.399	2.229	0.000	0.119	0.011	0.093	0.000	3.285	4.330	10.068	0.000	0.252	0.608	28.970
1963	12.921	0.000	12.921	2.268	2.921	0.000	0.129	0.001	0.093	0.000	3.637	5.130	11.911	0.000	0.252	0.605	27.957
1964	12.107	0.000	12.107	2.239	3.479	0.000	0.000	0.004	0.098	0.000	4.109	4.891	12.581	0.000	0.256	0.610	27.794
1965	8.741	0.000	8.741	1.794	3.854	0.000	0.000	0.003	0.101	0.432	3.741	4.953	13.084	0.000	0.200	0.480	24.298
1966	17.297	0.000	17.297	4.204	4.489	0.000	0.000	0.058	0.105	0.553	4.336	4.307	13.848	0.000	0.214	0.516	36.080
1967	20.953	0.000	20.953	2.815	5.816	0.000	0.000	0.005	0.095	1.315	2.698	5.360	15.288	0.000	0.214	0.513	39.781
1968	17.657	0.000	17.657	5.025	6.914	0.000	0.006	0.000	0.104	0.843	4.355	5.190	17.411	0.000	0.229	0.548	40.870
1969	13.783	0.000	13.783	21.073	7.794	0.000	0.006	0.297	0.105	0.860	5.151	5.276	19.488	0.000	0.258	0.619	55.221
1970	12.134	0.000	12.134	20.096	8.423	0.000	0.079	0.443	0.106	0.561	5.300	5.227	20.138	0.000	0.345	0.838	53.552
1971	13.353	0.000	13.353	19.637	7.776	0.000	0.079	0.526	0.106	1.012	4.942	5.566	20.007	0.000	0.361	0.880	54.239
1972	11.547	0.000	11.547	29.141	5.499	0.000	0.045	0.629	0.113	4.356	5.658	6.257	22.558	0.000	0.423	1.021	64.690
1973	13.119	0.000	13.119	30.386	4.992	0.000	0.045	0.495	0.127	0.598	4.413	6.332	17.002	0.000	0.421	1.020	61.948
1974	11.227	0.000	11.227	29.059	6.885	0.000	0.159	0.595	0.121	0.502	4.690	6.706	19.658	0.000	0.422	1.039	61.405
1975	13.675	0.000	13.675	41.035	7.567	0.000	0.182	0.967	0.108	0.557	3.810	7.027	20.217	0.000	1.655	4.069	80.650
1976	12.121	0.000	12.121	43.470	12.931	0.000	0.196	1.680	0.119	0.630	3.093	8.647	27.297	0.000	1.721	4.199	88.807
1977	8.129	0.000	8.129	67.904	15.663	0.000	0.242	2.480	0.125	0.653	3.697	10.666	33.525	0.000	2.015	4.974	116.547
1978	0.000	0.000	0.000	94.522	14.848	0.000	0.238	2.697	0.134	0.611	3.973	11.080	33.581	0.000	2.099	5.145	135.347

PHYSICAL UNITS

Year	Coal: Bituminous Coal and Lignite	Coal: Anthracite	Coal: Total Coal	Natural Gas (Dry)	Petroleum: Distillate Fuel	Petroleum: Jet Fuel	Petroleum: Kerosene	Petroleum: LPG[2]	Petroleum: Lubricants	Petroleum: Motor Gasoline	Petroleum: Residual Fuel	Petroleum: Other Petroleum Products	Petroleum: Total Petroleum	Hydroelectric Power	Electricity Sales
	Thousand Short Tons			Billion Cubic Feet	Thousand Barrels									Million Kilowatt Hours	
1960	249	0	249	1793	427	0	90	6	15	0	438	622	1598	0	74
1961	459	0	459	1869	466	0	33	4	15	0	393	756	1667	0	74
1962	549	0	549	3284	383	0	21	3	15	0	522	722	1667	0	74
1963	484	0	484	2200	501	0	23	0	15	0	578	929	2047	0	74
1964	453	0	453	2170	597	0	0	1	16	0	654	933	2201	0	75
1965	327	0	327	1738	662	0	0	1	17	82	595	962	2318	0	59
1966	646	0	646	4070	771	0	0	15	17	105	690	976	2574	0	63
1967	783	0	783	2728	999	0	0	1	16	250	429	1127	2821	0	63
1968	659	0	659	4874	1187	0	1	0	17	160	693	1181	3239	0	67
1969	514	0	514	20439	1338	0	1	74	17	164	819	1316	3730	0	76
1970	452	0	452	19492	1446	0	14	110	18	107	843	1321	3859	0	101
1971	492	0	492	19047	1335	0	14	131	17	193	785	1467	3943	0	106
1972	429	0	429	28275	944	0	8	157	19	829	900	1595	4452	0	124
1973	489	0	489	29790	857	0	8	123	21	114	702	1526	3351	0	123
1974	430	0	430	28278	1182	0	28	148	20	95	746	1657	3876	0	124
1975	530	0	530	40230	1299	0	32	241	18	106	606	1752	4054	0	485
1976	469	0	469	42659	2220	0	35	419	20	120	492	2114	5419	0	504
1977	312	0	312	66638	2689	0	43	618	21	124	588	2445	6528	0	590
1978	0	0	0	93033	2549	0	42	672	22	116	632	2656	6689	0	615

[1] Incurred in generation and transmission of electricity.
[2] Liquefied petroleum gases, including ethane.
Note: Totals do not include wood derived fuel consumed by the pulp and paper industry, if any, which amounted to an estimated 1.0 quadrillion Btu in the United States in 1978. Also excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy.

Consumption of Energy by the Transportation Sector, State of Alaska

TRILLION BTU

Year	Bituminous Coal and Lignite[1]	Natural Gas (Dry)	Petroleum								Electricity Sales	Electrical Energy Losses[2]	Total Energy Consumed
			Aviation Gasoline	Distillate Fuel	Jet Fuel	LPG[3]	Lubricants	Motor Gasoline	Residual Fuel	Total Petroleum			
1960	0.117	0.002	5.581	3.142	12.127	0.000	0.419	7.963	0.096	29.329	0.008	0.021	29.477
1961	0.057	0.049	5.992	3.665	14.322	0.000	0.406	8.659	0.108	33.152	0.009	0.021	33.288
1962	0.060	0.075	5.335	3.798	17.128	0.000	0.427	9.142	0.125	35.955	0.009	0.021	36.119
1963	0.049	0.043	4.068	3.340	17.476	0.000	0.427	9.413	0.189	34.913	0.008	0.018	35.032
1964	0.046	0.000	3.584	3.397	18.120	0.001	0.448	9.685	0.119	35.354	0.008	0.019	35.427
1965	0.029	0.000	3.034	4.606	18.217	0.001	0.461	10.997	0.411	37.727	0.008	0.018	37.782
1966	0.052	0.000	2.595	4.862	22.200	0.001	0.479	9.105	0.293	39.436	0.008	0.020	39.517
1967	0.051	0.000	3.474	5.029	27.305	0.001	0.432	9.509	0.269	45.019	0.008	0.020	46.098
1968	0.039	0.000	3.356	5.450	30.705	0.000	0.474	9.273	0.276	49.533	0.009	0.022	49.602
1969	0.023	0.000	3.071	4.753	38.031	0.001	0.477	10.706	0.748	57.808	0.009	0.021	57.861
1970	0.020	17.842	2.297	5.819	38.908	0.002	0.486	11.911	0.849	60.272	0.009	0.023	78.166
1971	0.018	17.743	1.995	8.248	43.598	0.002	0.483	13.339	1.452	69.117	0.009	0.023	86.910
1972	0.012	9.021	2.031	12.950	46.037	0.000	0.517	12.666	1.534	75.734	0.013	0.031	84.811
1973	0.009	0.173	2.077	10.875	42.567	0.000	0.579	14.118	2.075	72.290	0.014	0.033	72.519
1974	0.006	0.113	2.386	11.720	42.861	0.000	0.554	15.948	2.125	75.595	0.015	0.038	75.767
1975	0.002	0.096	2.337	12.256	42.347	0.000	0.491	19.215	3.131	79.776	0.012	0.030	79.917
1976	0.001	0.153	1.683	16.677	41.874	0.000	0.545	22.520	5.344	88.643	0.014	0.033	88.844
1977	0.001	0.265	1.854	16.734	44.798	0.000	0.570	22.291	7.230	93.478	0.013	0.032	93.788
1978	0.000	0.190	2.223	15.553	46.296	0.000	0.613	21.341	12.341	98.366	0.007	0.018	98.581

PHYSICAL UNITS

Year	Bituminous Coal and Lignite[1]	Natural Gas (Dry)	Petroleum								Electricity Sales
			Aviation Gasoline	Distillate Fuel	Jet Fuel	LPG[3]	Lubricants	Motor Gasoline	Residual Fuel	Total Petroleum	
	Thousand Short Tons	Billion Cubic Feet	Thousand Barrels								Million Kilowatt Hours
1960	4	2	1106	539	2251	0	69	1516	15	5497	2
1961	2	47	1187	629	2640	0	67	1648	17	6189	3
1962	2	72	1057	652	3144	0	70	1740	20	6683	3
1963	2	42	806	573	3208	0	70	1792	30	6480	2
1964	2	0	710	583	3325	0	74	1844	19	6555	2
1965	1	0	601	791	3327	0	76	2094	65	6954	2
1966	2	0	496	835	4031	0	79	1733	45	7219	2
1967	2	0	688	863	4955	0	71	1810	43	8431	2
1968	1	0	665	936	5573	0	78	1765	44	9060	3
1969	1	0	608	816	6848	0	79	2038	119	10508	3
1970	1	17306	455	999	6979	0	80	2268	135	10916	3
1971	1	17210	395	1416	7806	0	80	2539	231	12467	3
1972	0	8784	402	2223	8227	0	85	2411	244	13593	4
1973	0	170	411	1867	7604	0	95	2688	330	12996	4
1974	0	110	473	2012	7661	0	91	3036	338	13611	4
1975	0	94	463	2104	7567	0	81	3658	498	14370	4
1976	0	150	333	2863	7476	0	90	4287	850	15900	4
1977	0	260	367	2873	7991	0	94	4244	1150	16719	4
1978	0	187	440	2670	8258	0	101	4063	1963	17495	2

[1] No anthracite is consumed by the transportation sector.
[2] Incurred in the generation and transmission of electricity.
[3] Liquefied petroleum gases, including ethane.
Note: Totals may not equal sum of components due to independent rounding.
Note: Excludes small quantities of other energy sources for which consistent historical data are not available, such as solar energy obtained by the use of thermal and photovoltaic collectors; wind energy; and geothermal, biomass, and waste energy.

Consumption of Energy by the Electric Utilities, State of Alaska

TRILLION BTU

Year	Coal			Natural Gas (Dry)	Petroleum					Hydro-electric Power[1]	Nuclear Electric Power	Geo-thermal Power	Wood and Waste	Total Energy Consumed
	Bitu-minous Coal and Lignite	Anthra-cite	Total Coal		Distil-late Fuel	Jet Fuel	Petro-leum Coke	Residual Fuel	Total Petro-leum					
1960	0.000	0.000	0.000	0.000	0.514	0.000	0.000	0.013	0.527	0.000	0.000	0.000	0.000	0.527
1961	0.000	0.000	0.000	0.000	0.363	0.000	0.000	0.044	0.407	0.000	0.000	0.000	0.000	0.407
1962	0.000	0.000	0.000	0.000	0.410	0.000	0.000	0.000	0.410	0.000	0.000	0.000	0.000	0.410
1963	1.485	0.000	1.485	0.995	0.657	0.000	0.000	0.000	0.657	3.410	0.000	0.000	0.000	6.548
1964	2.278	0.000	2.278	1.649	1.368	0.000	0.000	0.025	1.393	3.374	0.000	0.000	0.000	8.695
1965	2.697	0.000	2.697	2.218	1.131	0.000	0.000	0.116	1.247	3.655	0.000	0.000	0.000	9.817
1966	2.702	0.000	2.702	3.983	0.838	0.000	0.000	0.283	1.122	3.293	0.000	0.000	0.000	11.100
1967	2.338	0.000	2.338	4.624	0.954	0.000	0.000	1.064	2.018	3.786	0.000	0.000	0.000	12.767
1968	2.569	0.000	2.569	5.844	1.033	0.000	0.000	1.017	2.049	3.781	0.000	0.000	0.000	14.243
1969	2.776	0.000	2.776	6.904	2.487	0.000	0.000	0.597	3.084	3.562	0.000	0.000	0.000	16.325
1970	4.253	0.000	4.253	8.452	2.208	0.000	0.000	0.132	2.340	3.807	0.000	0.000	0.000	18.852
1971	4.724	0.000	4.724	10.619	2.633	0.000	0.000	0.025	2.658	3.807	0.000	0.000	0.000	21.808
1972	4.298	0.000	4.298	13.448	2.790	0.000	0.000	0.013	2.803	3.594	0.000	0.000	0.000	24.142
1973	4.141	0.000	4.141	16.191	3.373	0.000	0.000	0.038	3.410	2.973	0.000	0.000	0.000	26.717
1974	4.628	0.000	4.628	17.494	2.412	0.000	0.000	0.019	2.430	3.407	0.000	0.000	0.000	27.959
1975	4.472	0.000	4.472	20.129	4.112	0.000	0.000	0.000	4.112	3.713	0.000	0.000	0.000	32.426
1976	4.385	0.000	4.385	22.715	5.423	0.000	0.000	0.000	5.423	3.978	0.000	0.000	0.000	36.500
1977	4.367	0.000	4.367	24.216	5.077	0.000	0.000	0.000	5.077	5.343	0.000	0.000	0.000	39.004
1978	4.698	0.000	4.698	25.262	5.149	0.000	0.000	0.000	5.149	4.924	0.000	0.000	0.000	40.033

PHYSICAL UNITS

Year	Coal			Natural Gas (Dry)	Petroleum					Hydro-electric Power[1]	Nuclear Electric Power	Geo-thermal Power	Wood and Waste
	Bitu-minous Coal and Lignite	Anthra-cite	Total Coal		Distil-late Fuel	Jet Fuel	Petro-leum Coke	Residual Fuel	Total Petro-leum				
	Thousand Short Tons			Billion Cubic Feet	Thousand Barrels					Million Kilowatt Hours			
1960	0	0	0	0	88	0	0	2	90	0	0	0	0
1961	0	0	0	0	62	0	0	7	69	0	0	0	0
1962	0	0	0	0	70	0	0	0	70	0	0	0	0
1963	84	0	84	965	113	0	0	0	113	325	0	0	0
1964	131	0	131	1598	235	0	0	4	239	322	0	0	0
1965	151	0	151	2149	194	0	0	18	213	350	0	0	0
1966	153	0	153	3856	144	0	0	45	189	316	0	0	0
1967	134	0	134	4481	164	0	0	169	333	363	0	0	0
1968	149	0	149	5668	177	0	0	162	339	364	0	0	0
1969	163	0	163	6696	427	0	0	95	522	341	0	0	0
1970	249	0	249	8198	379	0	0	21	400	363	0	0	0
1971	274	0	274	10300	452	0	0	4	456	363	0	0	0
1972	247	0	247	13094	479	0	0	2	481	346	0	0	0
1973	238	0	238	15812	579	0	0	6	585	286	0	0	0
1974	266	0	266	17117	414	0	0	3	417	326	0	0	0
1975	257	0	257	19619	706	0	0	0	706	357	0	0	0
1976	252	0	252	22204	931	0	0	0	931	383	0	0	0
1977	251	0	251	23534	872	0	0	0	872	512	0	0	0
1978	270	0	270	24431	884	0	0	0	884	472	0	0	0

[1] Includes net imports of electricity.
Note: Totals may not equal sum of components due to independent rounding.

APPENDIX B. DISPOSITION OF ROYALTY OIL AND GAS

TRADING BAY

Statistics relating to this field are shown on the attached table.

Current Status

All Royalty oil produced from this field is taken in kind and sold to Tesoro-Alaska Petroleum Company.

Gas produced for this field is casinghead gas and was formerly flared. DOGC Flaring Order Number 104 dated June 30, 1971, has prohibited flaring since July 1, 1972, and this gas is now recovered and used locally. This gas is considered to have no value because the costs of extraction, compression, and amortization purportedly exceed its value; therefore, no royalty is paid, but because of the recent price increases this gas should be looked at again for proper value.

Royalty Oil and Gas Status

Unit: Trading Bay

Location: West Side Cook Inlet (Offshore)

Operator: Union

Owners: Union, Amoco, Phillips, Arco, Getty

Leases: ADL 17579, 17594, 17602, 18716, 18729, 18730, 18758, 18772, 18777, 21068

Royalty: 12.5%

Purchaser:	Price $/Mcf	Price $/Bbl	
Tesoro		9.87	(as of Nov. 1980)

		State Royalty Status
Date Initial Production:	12-67 (oil) 12-68 (gas)	
Avg. Monthly Production Rate (10/31/80) gas:	122,285 Mcf	RIV
Avg. Monthly Production Rate (11/30/80) oil:	133,304 Bbls	RIK
Total Production to 10/31/80 (casinghead) gas:	51,781,247 Mcf	
Total Production to 9/30/79 oil:	80,502,934 Bbls	
Estimated percent produced to 10/31/80	87.7% Oil	

RIV: Royalty in Value

RIK: Royalty in Kind

KENAI UNIT AND KENAI DEEP

Statistics relating to this field are shown on the attached table.

Current Status

The Kenai Unit and Kenai Deep provide most of the gas sales in the Cook Inlet area. The estimated quantity of Alaska State royalty gas sales amounts to approximately 127,000 MCF per month. The State does not receive the full 12 1/2% royalty share because of the predominance of Federal leases in the unit and the recent conveyance of land to CIRI. The price the State receives for its royalty share results from prices paid under existing contracts between the lessees and their purchasers. Anchorage Municipal Light and Power has entered into a purchase contract with the State to purchase its royalty share.

Royalty Oil and Gas Status

Kenai and Kenai Deep

Location: Kenai, Alaska

Operator: Union

Owners: Union, Marathon, Arco, Chevron, Charles Schraier, Samuel Gray

Leases: Fed. A028047, A028055, A028056, A028103, A028140, A028142, A028143
State ADL 22330, 00460, 02397, 00588, 00593, 00594, 02411

Royalty: State's effective rate is 2.06879% from the Kenai Unit. 0% from Kenai Deep.

Purchaser:	Royalty Price $/Mcf
City of Kenai	0.29
Collier Chemical Corp.	0.18 & 0.61
Phillips-Marathon LNG	0.52
Alaska Pipeline	0.52
Rental Gas (Swanson River Oil Field)	0.16
Chevron Refining	0.52

		State Royalty Status
Date Initial Production:	1-62	RIV
Avg. Monthly Production Rate (1980)	6,640,000 Mcf	
Cumulative Production to 11/30/80	1,074,081,577 Mcf	
Estimated percent produced to 10/31/80	9.9%	

RIV: Royalty in Value

McARTHUR RIVER FIELD

Statistics relating to this field are shown on the attached table.

Current Status

All Royalty oil produced from this field is taken in kind and sold to Tesoro-Alaska Petroleum Company.

Gas Produced from this field is casinghead gas and was formerly flared. DOGC Flaring Order Number 104 dated June 30, 1971 has prohibited flaring since July 1, 1972, and this gas is now recovered and used locally. This gas is considered to have no value because the costs of extraction, compression, and amortization purportedly exceed its value; therefore, no royalty is paid, but due to the increasing value of this gas the net value should be reevaluated.

Royalty Oil and Gas Status

McArthur River Field

Location: West Side - Cook Inlet (Offshore)

Operator: Union

Leases: ADL 18777, 17579

Royalty: 12.5%

Purchaser:

	Price $/Mcf	Price $/Bbl	
Tesoro	-	8.97	(as of Nov. 1980)

		State Royalty Status
Date Initial Production:	12-67	
Avg. Monthly Production Rate (to 10/31/80) gas:	571,763 Mcf	RIV
Avg. Monthly Production Rate (1980) oil:	1,740,029 Bbls	RIK
Total Production to 10/31/80 (casinghead & dry) gas:	135,835,372 Mcf	
Total Production to 10/31/80 oil:	436,560,176 Bbls	
Estimated percent produced 10/31/80 (gas):	38%	
Estimated percent produced 10/31/80 (oil):	81%	

RIV: Royalty in Value

RIK: Royalty in Kind

GRANITE POINT FIELD

Statistics relating to this field are shown on the attached table.

Current Status

All Royalty oil produced from this field is taken in kind and sold to Tesoro-Alaska Petroleum Company.

Gas produced from this field is casinghead gas and was formerly flared. DOGC Flaring Order Number 194 dated June 30, 1971, has prohibited flaring since July 1, 1972, and this gas is now recovered and used locally. This gas is considered to have no value because the costs of extraction, compression, and amortization purportedly exceed its value; therefore, no royalty is paid, but due to recent increases in the value of this gas there should be a reevaluation of this gas.

Royalty Oil and Gas Status

Granite Point Field

Location: West Side - Cook Inlet (Offshore)

Operator: Amoco

Leases: ADL 17586, 17587, 18742, 18761

Royalty: 12.5%

Purchaser:

	Price $/Mcf	Price $/Bbl
Tesoro		12.00
Amoco Platform (1)	0.118	
Arco (1)	0.10	
Union (1)	0.118	

		State Royalty Status
Date Initial Production:	12-67	
Avg. Monthly Production Rate (1980) gas:	275,736 Mcf	RIV
Avg. Monthly Production Rate (1980) oil:	360,483 Bbls	RIK
Total Production to 10/31/80 (casinghead) gas:	73,546,506 Mcf	
Total Production to 10/31/80 oil:	82,836,316 Bbls	
Estimated percent oil produced to 10/31/80:	82%	

Footnotes: (1) Small amount of casinghead gas sold to Amoco for use on platform, the remainder has a negative value.

RIV: Royalty in Value

RIK: Royalty in Kind

PRUDHOE BAY

Statistics relating to this unit are shown on the attached table.

Current Status

Small quantities of casinghead gas are presently being sold to the owners of the Trans-Alaska Pipeline. The State is receiving royalty in value with the price being set by the owners of the gas cap. They are using the price established by the Natural Gas Policy Act of 1978 as their guideline. There presently isn't any other market. The State's share of sales is 12 1/2%.

The State's royalty share of the oil produced is 12 1/2% with 56.5% of this share presently being taken in kind and sold to North Pole Refinery, Alaska Oil Company, Tesoro, and Chevron. The State has requested that an additional 43.4% of the State's share be taken in kind beginning July 1, 1981, which will go to, in addition to the current purchasers, Golden Valley Electric Association, Shell, Union, Alaska Petroleum, Oasis Petroleum, and Energy Cooperative Incorporated. The remainder will continue to be taken in value which will be fully decontrolled by October 1981.

Royalty Oil and Gas Status

Unit: Prudhoe Bay

Location: Northslope (Onshore)

Operator: Arco-Sohio

Owners: See Attachment

Leases: See Attachment

Royalty: 12.5%

Purchaser:

	Price $/Mcf	Price $/Bbl	
TAPS Owners	1.37		
Topping Plant, Power-plant, & Pump Stations			
Avg. Well Head Price		16.94	(as of Oct 1980)

		State Royalty Status RIV	
Date Initial Production:	10-69		
Avg. Monthly Production Rate (1980) gas:	50,363,142 Mcf		
Avg. Monthly Production Rate (1980) oil:	46,448,708 Bbls	RIV	RIK
Total Production to 10/31/80 gas:	1,344,185,727 Mcf		
Total Production to 10/31/80 oil:	1,460,173,383 Bbls		
Estimated percent produced to 10/31/80:	18% oil		
Estimated percent produced to 10/31/80:	9% gas		

RIV: Royalty in Value

RIK: Royalty in Kind

OWNERS

Amerada Hess—Amerada Hess Corporation

A.R.Co.—Atlantic Richfield Company

BP Alaska—BP Alaska Exploration Inc.

Chevron—Chevron U.S.A., Inc.

Exxon—Exxon Corporation

Getty—Getty Oil Company

Hunt Ind.—Hunt Industries

Caroline Hunt Tr.—Caroline Hunt Trust Estate

Lamar Hunt Tr. Est.—Lamar Hunt Trust Estate

N. B. Hunt—N. B. Hunt

Wm. Herbert Hunt Tr.—William Herbert Hunt Trust Estate

LL&E—The Louisiana Land and Exploration Company

Marathon—Marathon Oil Company

Mobil—Mobil Oil Corporation

Phillips—Phillips Petroleum Company

Placid—Placid Oil Company

Sohio—Sohio Petroleum Company

LEASES

Description (Umiat Meridian, Alaska)	No. of Acres	ADL Serial No.	Basic Royalty	Lessee of Record	O.R.R. Interest	Working Interest Ownership
T12N-R11E, Secs. 9, 10	1,280	47445	1/8	Mobil and Chevron		Mobil—50% Chevron—50%
T12N-R11E, Secs. 11, 12	1,280	28235	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R12E, Sec. 7	580	28254	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R15E, Sec. 23, 24	1,280	34625	1/8	Sohio Petroleum Co.	*	Sohio—100%
T12N-R15E, Secs. 21, 22	1,280	34626	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R15E, Secs. 19, 20	1,225	34627	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R14E, Secs. 23, 24	1,280	34624	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R14E, Sec. 22	640	28297	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
T12N-R13E, Sec. 19	585	47469	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
T12N-R12E, Secs. 23, 24	1,280	47448	1/8	Mobil and Phillips		Mobil—66⅔% Phillips—33⅓%
T12N-R12E, Secs. 21, 22	1,280	28256	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
2 T12N-R12E, Secs. 17, 18, 19, 20	2,448	28255	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
3 T12N-R11E, Secs. 13, 14, 23, 24	2,560	28237	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
4 T12N-R11E, Secs. 15, 16, 21, 22	2,560	47447	1/8	Mobil and Chevron		Mobil—50% Chevron—50%
5 T12N-R11E, Secs. 17, 18, 19, 20	2,448	47446	1/8	Mobil and Chevron		Mobil—50% Chevron—50%
6 T12N-R10E, Secs. 13, 24	1,280	25637	1/8	A.R.Co., BP Alaska, Sohio Petroleum Co.		A.R.Co.—50% BP Alaska—37½% Sohio—12½%
17 T12N-R11E, Secs. 29, 30, 32	1,868	47449	1/8	Mobil and Chevron		Mobil—50% Chevron—50%
18 T12N-R11E, Secs. 27, 28, 33, 34	2,560	28239	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
19 T12N-R11E, Secs. 25, 26, 35, 36	2,560	28238	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
20 T12N-R12E, Secs. 29, 30, 31, 32	2,459	28259	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
21 T12N-R12E, Secs. 27, 28, 33, 34	2,560	28258	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
22 T12N-R12E, Secs. 25, 35, 36, N/2 and SE/4 Sec. 26	2,400	28257	1/8	Mobil and Phillips		Mobil—50% Phillips—50%

*See comment on page A-5.

Tract No.	Description	No. of Acres	ADL Serial No.	Basic Royalty	Lessee of Record	O.R.R. Interest	Working Interest Ownership
	(Umiat Meridian, Alaska)						
22A	T12N-R12E, SW/4 Sec. 26	160	28257	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
23	T12N-R13E, Secs. 29, 30, 31, 32	2,459	28279	1/8	Sohio Petroleum Co.	*	Sohio—100%
24	T12N-R13E, Secs. 27, 28, 33, 34	2,560	28278	1/8	Sohio Petroleum Co.	*	Sohio—100%
25	T12N-R13E, Secs. 26, 35, 36	1,920	28277	1/8	Sohio Petroleum Co.	*	Sohio—100%
26	T12N-R14E, Secs. 29, 31, 32	1,871	28299	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
27	T12N-R14E, Secs. 27, 28, 33, 34	2,560	28300	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
28	T12N-R14E, Secs. 25, 26, 35, 36	2,560	28301	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
29	T12N-R15E, Secs. 29, 30, 31, 32	2,459	34628	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
30	T12N-R15E, Secs. 27, 28, 33, 34	2,560	34629	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
31	T12N-R15E, Secs. 25, 26, 35, 36	2,560	34630	1/8	Sohio Petroleum Co.	*	Sohio—100%
32	T12N-R16E, Secs. 29, 30, 31, 32	2,459	34635	1/8	Sohio Petroleum Co.	*	Sohio—100%
33	T12N-R16E, Secs. 27, 28, 33, 34	2,560	34634	1/8	Sohio Petroleum Co.	*	Sohio—100%
34	T12N-R16E, Secs. 25, 26, 35, 36	2,560	34633	1/8	Sohio Petroleum Co.	*	Sohio—100%
35	T11N-R16E, Secs. 1, 2, 11, 12	2,560	34636	1/8	Sohio Petroleum Co.	*	Sohio—100%
36	T11N-R16E, Secs. 3, 4, 9, 10	2,560	28337	1/8	Sohio Petroleum Co.	*	Sohio—100%
37	T11N-R16E, Secs. 5, 6, 7, 8	2,469	28338	1/8	Sohio Petroleum Co.	*	Sohio—100%
38	T11N-R15E, Secs. 1, 2, 11, 12	2,560	28320	1/8	Sohio Petroleum Co.	*	Sohio—100%
39	T11N-R15E, Secs. 3, 4, 9, 10	2,560	34631	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
40	T11N-R15E, Secs. 5, 6, 7, 8	2,469	34632	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
41	T11N-R14E, Secs. 1, 2, 11, 12	2,560	28302	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
42	T11N-R14E, Secs. 3, 4, 9, 10	2,560	28303	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
43	T11N-R14E, Secs. 5, 6, 7, 8	2,469	28304	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
44	T11N-R13E, Secs. 1, 2, 11, 12	2,560	28280	1/8	Sohio Petroleum Co.	*	Sohio—100%
45	T11N-R13E, Secs. 3, 4, 9, 10	2,560	28281	1/8	Sohio Petroleum Co.	*	Sohio—100%
46	T11N-R13E, Secs. 5, 6, 7, 8	2,469	28282	1/8	Sohio Petroleum Co.	*	Sohio—100%
47	T11N-R12E, Secs. 1, 2, 11, 12	2,560	28260	1/8	Sohio Petroleum Co.	*	Sohio—100%
48	T11N-R12E, Secs. 3, 4, 9, 10	2,560	28261	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
49	T11N-R12E, Secs. 5, 6, 7, 8	2,469	47450	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
50	T11N-R11E, Secs. 1, 2, 11, 12	2,560	28240	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
51	T11N-R11E, Secs. 4, 9, 10, N/2 and SW/4 Sec. 3	2,400	28241	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
51A	T11N-R11E, SE/4 Sec. 3	160	28241	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%

*See comment on page A-5.

Tract No.	Description	No. of Acres	ADL Serial No.	Basic Royalty	Lessee of Record	O.R.R. Interest	Working Interest Ownership
	(Umiat Meridian, Alaska)						
52	T11N-R11E, Sec. 15	640	28244	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
53	T11N-R11E, Secs. 13, 14, 24	1,920	28245	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
54	T11N-R12E, Secs. 17, 18, 19	1,840	28262	1/8	Chevron		Chevron—100%
54A	T11N-R12E, Sec. 20	640	28262	1/8	Chevron, Mobil, Phillips		Chevron—33⅓% Mobil—33⅓% Phillips—33⅓%
55	T11N-R12E, Secs. 15, 16	1,280	28263	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
55A	T11N-R12E, Secs. 21, 22	1,280	28263	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
56	T11N-R12E, Secs. 13, 14, 23, 24	2,560	47451	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
57	T11N-R13E, Secs. 17, 18, 19, 20	2,480	28283	1/8	Sohio Petroleum Co.	*	Sohio—100%
58	T11N-R13E, Secs. 15, 16, 21, 22	2,560	28284	1/8	Sohio Petroleum Co.	*	Sohio—100%
59	T11N-R13E, Secs. 13, 14, 23, 24	2,560	28285	1/8	Sohio Petroleum Co.	*	Sohio—100%
60	T11N-R14E, Secs. 17, 18, 19, 20	2,480	28305	1/8	Sohio Petroleum Co.	*	Sohio—100%
61	T11N-R14E, Secs. 15, 16, 21, 22	2,560	28306	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
62	T11N-R14E, Secs. 13, 14, 23, 24	2,560	28307	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
63	T11N-R15E, Secs. 17, 18, 19, 20	2,480	28321	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
64	T11N-R15E, Secs. 15, 16, 21, 22	2,560	28322	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
65	T11N-R15E, Secs. 13, 14, 23, 24	2,560	28323	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
66	T11N-R16E, Secs. 17, 18, 19	1,840	28339	1/8	Sohio Petroleum Co.	*	Sohio—100%
67	T11N-R16E, Secs. 15, 16	1,280	28340	1/8	Sohio Petroleum Co.	*	Sohio—100%
68	T11N-R16E, Secs. 13, 14	1,280	28341	1/8	Sohio Petroleum Co.	*	Sohio—100%
69	T11N-R16E, Secs. 30, 31, 32	1,851	28343	1/8	Sohio Petroleum Co.	*	Sohio—100%
70	T11N-R15E, Secs. 25, 26, 35, 36	2,560	28324	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
71	T11N-R15E, Secs. 27, 28, 33, 34	2,560	28325	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
72	T11N-R15E, Secs. 29, 30, 31, 32	2,491	28326	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
73	T11N-R14E, Secs. 25, 26, 35, 36	2,560	28308	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
74	T11N-R14E, Secs. 27, 28, 33, 34	2,560	28309	1/8	Sohio Petroleum Co.	*	Sohio—100%
75	T11N-R14E, Secs. 29, 30, 31, 32	2,491	28310	1/8	Sohio Petroleum Co.	*	Sohio—100%
76	T11N-R13E, Secs. 25, 26, 35, 36	2,560	28286	1/8	Sohio Petroleum Co.	*	Sohio—100%
77	T11N-R13E, Secs. 27, 28, 33, 34	2,560	28287	1/8	Sohio Petroleum Co.	*	Sohio—100%
78	T11N-R13E, Secs. 29, 30, 31, 32	2,491	28288	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
79	T11N-R12E, Secs. 25, 26, 35, 36	2,560	28264	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%

*See comment on page A-5.

Tract No.	Description	No. of Acres	ADL Serial No.	Basic Royalty	Lessee of Record	O.R.R. Interest	Working Interest Ownership
	(Umiat Meridian, Alaska)						
80	T11N-R12E, Secs. 27, 28, 33, 34	2,560	47452	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
81	T11N-R12E, Secs. 29, 30, 31, 32	2,491	47453	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
82	T11N-R11E, Sec. 25	640	28246	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
83	T10N-R12E, Secs. 3, 4, 10	1,920	47454	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
84	T10N-R12E, Secs. 1, 2, 11, 12	2,560	28265	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
85	T10N-R13E, Secs. 6, 7, 8, S/2 and NE/4 Sec. 5	2,341	28289	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
85A	T10N-R13E, NW/4 Sec. 5	160	28289	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
86	T10N-R13E, Secs. 3, 4, 9, 10	2,560	47471	1/8	Amerada Hess, et. al.		Amerada Hess—27% Getty—30.5% I.L.&E—13.25% Placid—9.125% N. B. Hunt—6.3625% Hunt Ind.—3.8625% Caroline Hunt Tr.—3.3% Wm. Herbert Hunt Tr.—3.3% Lamar Hunt Tr. Est.—3.3%
87	T10N-R13E, Secs. 1, 2, 11, 12	2,560	47472	1/8	Amerada Hess and Getty		Amerada Hess—50% Getty—50%
88	T10N-R14E, Secs. 5, 6, 7, 8	2,501	28313	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
89	T10N-R14E, Secs. 3, 4, 9, 10	2,560	28312	1/8	Sohio Petroleum Co.	*	Sohio—100%
90	T10N-R14E, Secs. 1, 2, 11, 12	2,560	28311	1/8	Sohio Petroleum Co.	*	Sohio—100%
91	T10N-R15E, Secs. 5, 6, 7, 8	2,501	28329	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
92	T10N-R15E, Secs. 3, 4, 9, 10	2,560	28328	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
93	T10N-R15E, Secs. 1, 2, 11, 12	2,560	28327	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
94	T10N-R16E, Secs. 5, 6, 7, 8	2,501	28345	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
95	T10N-R16E, Secs. 4, 9	1,280	28344	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
96	T10N-R16E, Sec. 16	640	28347	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%

*See comment on page A-5.

Tract No.	Description	No. of Acres	ADL Serial No.	Basic Royalty	Lessee of Record	O.R.R. Interest	Working Interest Ownership
	(Umiat Meridian, Alaska)						
97	T10N-R16E, Secs. 17, 18, 19, 20	2,512	28346	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
98	T10N-R15E, Secs. 13, 14, 23, 24	2,560	28332	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
99	T10N-R15E, Secs. 15, 16, 21, 22	2,560	28331	1/8	Sohio Petroleum Co.	*	Sohio—100%
00	T10N-R15E, Secs. 17, 18, 19, 20	2,512	28330	1/8	Sohio Petroleum Co.	*	Sohio—100%
01	T10N-R14E, Secs. 13, 14, 23, 24	2,560	28315	1/8	Sohio Petroleum Co.	*	Sohio—100%
02	T10N-R14E, Secs. 15, 16, 21, 22	2,560	28314	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
03	T10N-R14E, Secs. 17, 18, 19, 20	2,512	47475	1/8	Amerada Hess, et. al.		Amerada Hess—25% Getty—25% Marathon—25% Placid—7.5% N. B. Hunt—5% Hunt Ind.—3.125% Caroline Hunt Tr.—3.125% Wm. Herbert Hunt Tr.—3.125% Lamar Hunt Tr. Ext.—3.125%
04	T10N-R13E, Secs. 13, 14, 24	1,920	47476	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
05	T10N-R13E, Secs. 15, 16	1,280	28290	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
06	T10N-R14E, Secs. 27, 28	1,280	47482**	1/8	A.R.Co. and Exxon		A.R.Co.—50% Exxon—50%
07	T10N-R14E, Secs. 26, 36	1,280	28316	1/8	Chevron		Chevron—100%
07A	T10N-R14E, Sec. 25	640	28316	1/8	Chevron, Mobil, Phillips		Chevron—33⅓% Mobil—33⅓% Phillips—33⅓%
08	T10N-R15E, Secs. 29, 30, 31, 32	2,523	28335	1/8	Sohio Petroleum Co.	*	Sohio—100%
09	T10N-R15E, Secs. 33, 34	1,280	28334	1/8	Mobil and Phillips		Mobil—50% Phillips—50%
09A	T10N-R15E, Secs. 27, 28	1,280	28334	1/8	Mobil, Phillips, Chevron		Mobil—33⅓% Phillips—33⅓% Chevron—33⅓%
10	T10N-R15E, Secs. 25, 26, 35, 36	2,560	28333	1/8	Sohio Petroleum Co.	*	Sohio—100%
11	T10N-R16E, Secs. 29, 30, 31	1,883	28349	1/8	Sohio Petroleum Co.	*	Sohio—100%
		245,767					

BP Alaska, Inc. owns an overriding royalty interest equal to 75% of all net profits from production between certain levels of oil production.

This Tract Number 106 was assigned to A.R.Co. and Exxon. Upon approval of the assignment by the Director a new ADL Serial No. will be given to this Tract.

NICOLAI CREEK

Statistics relating to this unit are shown on the attached table.

Current Status

Gas from this small field, when produced, is used only to provide fuel for platform and shore facilities supporting petroleum production in this area. However, at the present time there is no production. There is no prospective purchaser for the State's royalty share.

Royalty Oil and Gas Status

Unit: Nicolai Creek

Location: West Side - Cook Inlet (Onshore-Offshore)

Operator: Texaco

Owners: Texaco, Superior

Leases: Fed. A034161, ADL 17585, 17598

Royalty: 12.5%

Purchaser:	Royalty Price $/Mcf	State Royalty Status
Amoco (1)		
Date Initial Production:	10-68	
Avg. Monthly Production Rate (1980) gas:	-0- Mcf	RIV
Total Production to 10/31/80 (dry gas):	1,062,055 Mcf	

Footnotes: (1) Shut-in

RIV: Royalty in Value

NORTH COOK INLET

Statistics relating to this field are shown on the attached table.

Current Status

Gas from this offshore field is primarily delivered to the Phillips LNG plant and the products are subsequently sold in Japan. However, in 1977, the State entered into agreements with Phillips and Alaska Pipeline Company to sell the royalty share to Alaska Pipeline Company for delivery to the Alaska market. Royalty gas in excess of purchases by Alaska Pipeline Company is purchased by Phillips.

Royalty Oil and Gas Status

Unit: North Cook Inlet

Location: North Cook Inlet

Operator: Phillips

Owners: Phillips, Chevron

Leases: ADL 17590, 18741, 37831, 18740, 17589

Royalty: 12.5%

Purchaser:		Royalty Price $/Mcf	State Royalty Status
Alaska Pipeline	1.90	(RIK; as of Nov 1980)	RIK
Phillips	2.0469	(RIV; as of Jan 1981)	RIV

Date Initial Production: 3-69

Avg. Monthly Production Rate (1980) gas: 2,955,896 Mcf

Total Production to 10/31/80 (dry gas): 490,487,024 Mcf

Estimated percent produced to 10/31/80: 18.6%

Comments: Contracts completed 1977 to take in kind for sale to Alaska Pipeline Company.

RIK: Royalty in Kind

RIV: Royalty in Value

STERLING

Statistics relating to this field are shown on the attached table.

Current Status

This is a small field in Kenai Peninsula. Since Federal leases are involved, the State's royalty share is approximately 1.6% due to the recent land conveyance to CIRI. The only gas sold from this field is consumed locally. There is no gas pipeline currently available to deliver this gas from this field to any other market. Because of limited reserves, there is no prospect of additional markets.

Royalty Oil and Gas Status

Unit: Sterling

Location: Kenai Peninsula (Onshore)

Operator: Union

Owners: Union, Marathon

Leases: Fed. A028135, A028063, ADL 01836, 02497, 00479-A

Royalty: 12.5% (1)

Purchaser:	Royalty Price $/Mcf
Sport Lake Greenhouse	0.40

Date Initial Production: 5-62

Avg. Monthly Production Rate (11/30/80) gas: 2,000 Mcf

Total Production to 10/31/80 (dry gas): 1,979,777 Mcf

Estimated percent produced to 10/31/80: 8.1%

State Royalty Status
RIV

Footnotes: (1) A portion of Unit is owned by Federal government and CIRI. The State's effective rate is 1.55461%.

RIV: Royalty in Value

BELUGA RIVER

Statistics relating to this field are shown on the attached table.

Current Status

This operating unit is located on the North-West side of the Cook Inlet. Chugach Electric is the only current purchaser of this gas. Their contract price is as stated and results in the royalty "in value" price. It is understood that Pacific Alaska LNG has contracted to purchase gas from this field in the future.

Chugach Electric uses this gas for power generation which is delivered to the Anchorage market.

There is no gas pipeline currently available to deliver gas from this field to any other market.

There is no current purchaser for the State's royalty, and due to the majority of Federal leases the State's share is 7.55% which was reduced due to a reallocation of the royalty ownership. The reallocation was due to changing the ownership from surface acre to reservoir percentage.

Royalty Oil and Gas Status

Unit: Beluga River

Location: West Side - Cook Inlet (Onshore)

Operator: Chevron

Owners: Chevron, Arco, Shell

Leases: Fed. A029656, A029657, ADL 17658, 17592, 17599, 21128, 21127, 21129, 21126

Royalty: 12.5% (1)

Purchaser:	Royalty Price $/Mcf
Chugach Electric	.1974

Date Initial Production: 1-68

Avg. Monthly Production Rate (11/30/80) gas: 1,350,000 Mcf

Total Production to 10/31/80 (dry gas): 104,006,863 Mcf

Estimated percent produced to 9/30/79: 10.9%

State Royalty Status
RIV

Footnotes: (1) Federal leases involved. State's effective royalty rate is 7.55%

RIV: Royalty in Value

MIDDLE GROUND SHOALS FIELD

Statistics relating to this field are shown on the attached table.

Current Status

All Royalty oil produced from this field is taken in kind and sold to Tesoro-Alaska Petroleum Company.

Gas produced for this field is casinghead gas and was formerly flared. DOGC Flaring Order Number 104 dated June 30, 1971, has prohibited flaring since July 1, 1972, and this gas is now recovered and used locally. This gas is considered to have no value because the costs of extraction, compression, and amortization purportedly exceed its value; therefore, no royalty is paid.

Recent increases in gas prices are now becoming high enough to cause the State to take another look.

Royalty Oil and Gas Status

Middle Ground Shoals Oil Field

Location: East Side - Cook Inlet (Offshore)

Operator: Shell & Amoco

Leases: ADL 17595, 18754, 18756, 18744, 18746

Royalty: 12.5%

Purchaser:

	Price $/Mcf	Price $/Bbl	
Tesoro	-	10.77	(as of Nov. 1980)

Date Initial Production:	9-67
Avg. Monthly Production Rate (10/31/80) gas:	220,349 Mcf
Avg. Monthly Production Rate (10/31/80) oil:	400,788 Bbls
Total Production 10/31/80 (casinghead gas):	62,430,236 Mcf
Total Production 10/31/80 oil:	128,696,691 Bbls
Estimated percent produced to 9/30/79 oil:	68%

State Royalty Status: RIV

RIV: Royalty in Value

APPENDIX C. REFINERY AND PIPELINE DATA

STATE OF ALASKA
PETROLEUM PROCESSING PLANTS

REFINERY	PLANT CAPACITY	DATE PLANT IN OPERATION	DATE EXPANSIONS	PLANT PRODUCT	DESTINATION
NIKISKI Chevron Refinery	26,000 BPD	1962		JP4, JA50, Furnace Oil, Diesels, Fuel Oil, Asphalt, Unfinished Gasoline.	JP4, JA50, Furnace Oil, Diesels, and Asphalt for Alaska; Unfinished Gasoline, Low Sulfur Fuels to Lower-48 states.
Tesoro Refinery	48,500 BPD	1969 (17,500 BPD)	1974, 1975, 1977 1980(7500 BPD Hydrocracker Unit.)	Propane, Unleaded, Regular, and Premium Gasoline, Jet A, Diesel Fuel No. 2 Diesel, JP 4 and No. 6 Fuel Oil.	Alaska except No.6 Fuel Oil to Lower-48 states.
Phillips-Marathon LNG	230,000 MCF/Day	1969		Liquified Natural Gas.	Japan, by tanker, 2 tankers capacity 71,500 cubic meters each avg. one ship every 10 days.
Union Chemical Division	Ammonia 900,00 tons/yr Urea 735,000 tons/yr	1969	1977	Anhydrous Ammonia, Urea Prills and Granules.	West Coast and export by tanker and bulk freighter.
Pacific Alaska LNG	200,000 MCF/Day initial	Planned 1985 (?)		Liquified Natural Gas.	Southern California one ship every 13 days.
INTERIOR ALASKA North Pole Refinery	32,000 BPD	1977		Military Jet Fuel, 1600-2400 BPD Commercial Jet Fuel, 3300-4300 Diesel/Heating Fuel No. 1, 1000-1500 Diesel/Heating Fuel No. 2, 1600-2200 Diesel Fuel Type No. 4 1000-4200 BPD.	Fairbanks area, Nenana and river village.
VALDEZ Alpetco Company	150,000 BPD	Planned 1985 (?)		(Proposed) Unleaded Gasoline 25,690 BPD Jet Fuel 50,000 BPD Diesel 32,290 BPD Naphtha 11,500 BPD Benzene 2,530 BPD Tolulene 5,640 BPD Xylene 6,172 BPD Sulfur 190 tons/day	Alaska, Lower-48, world markets.

SOURCE: State of Alaska, Department of Natural Resources, Oil and Gas Conservation Commission. Annual Statistical Report.

ALYESKA PIPELINE SERVICE CO.
TRANS-ALASKA PIPELINE STATISTICS

1979	THROUGHPUT PUMP STATION #1 BBLS OIL	CLOSING STORAGE VALDEZ BBLS OIL	NUMBER SHIPS LOADED	SHIP AVERAGE VOLUME BBLS OIL	SHIP LIFTINGS BBLS OIL
January	37,839,145	6,848,950	56	658,037	36,850,088
February	31,822,825	3,148,683	48	728,790	34,981,898
March	37,949,073	1,956,878	56	692,143	38,759,997
April	36,688,035	5,480,777	46	717,706	33,014,492
May	38,103,915	3,030,003	55	679,217	37,356,945
June	33,899,851	2,197,235	52	716,490	37,257,480
July	39,887,425	5,059,782	48	731,039	35,089,868
August	49,574,976	2,928,683	54	785,916	42,439,444
September	39,718,667	3,008,558	49	781,464	38,291,725
October	42,412,615	3,699,503	54	739,729	39,945,357
November	45,153,408	8,312,029	57	749,321	42,711,323
December	43,726,835	4,566,462	58	821,202	47,629,706
Total Year	467,776,770		633		464,328,323
Average Month	38,981,398		52.75	733,421	38,694,027

ESTIMATED DISTRIBUTION OF PRUDHOE BAY CRUDE OIL*

DESTINATION	BBLS OIL PER DAY
West Coast of USA	950,000
Gulf Coast and East Coast of USA via Panama Canal	425,000
East Coast and Virgin Island via Cape Horn	85,000
Alaska Refineries	28,000

* Wilson, H.M., "North Slope Oil: A Bargin for Lower 48 Refineries", Oil and Gas Journal, April 21, 1980.

SOURCE: State of Alaska, Department of Natural Resources, Oil and Gas Conservation Commission. Annual Statistical Report.