

SCOMM

11:11

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax 3-13-75	Pump price 3-18-75	Pump price 3-19-74
Albany	44.9	56.9	49.9
Albuquerque	42.4	53.4	48.9
Amarillo	40.1	49.1	41.9
Atlanta	43.6	55.1	49.2
Baltimore	41.9	54.9	48.9
Birmingham	41.9	53.9	47.9
Boston*	43.6	55.1	49.2
Buffalo	44.9	56.9	49.9
Charlotte	41.9	54.9	48.9
Cheyenne	44.9	55.9	49.9
Chicago*	43.6	56.6	50.4
Cleveland	42.9	53.9	47.9
Cerpus Christi	40.6	49.6	42.4
Dallas	40.6	49.6	42.4
Denver	43.9	54.9	49.9
Des Moines	43.0	54.0	49.9
Detroit	41.5	54.5	49.9
Fort Worth	40.6	49.6	42.4
Houston	40.6	49.6	42.4
Indianapolis	43.9	55.9	49.9
Jacksonville	41.9	53.9	47.9
Kansas City	43.4	54.4	49.9
Little Rock	41.5	53.0	48.9
Louisville	44.9	55.9	49.9
Los Angeles	40.5	51.5	50.5
Memphis	43.0	54.0	49.9
Miami	43.1	55.1	49.2
Milwaukee	43.9	54.9	48.9
Minn. St. Paul	44.0	55.0	50.9
Newark	45.1	56.1	50.2
New Orleans	40.9	52.9	46.9
New York*	45.9	58.9	52.9
Norfolk	41.1	54.1	48.2
Okla. City	42.4	53.0	48.9
Omaha	43.4	55.9	49.9
Philadelphia	41.9	54.9	47.9
Phoenix	43.6	54.6	50.9
Pittsburgh	41.9	54.9	47.9
Portland, Ore.	41.0	52.0	51.4
Salt Lake City	42.4	53.4	47.9
San Antonio	40.1	49.1	41.9
San Diego	41.5	52.5	50.3
San Francisco	41.5	52.5	51.0
Seattle	40.6	53.6	51.0
Spokane	40.7	53.7	52.1
Springfield, Ill.*	44.0	57.0	52.9
St. Louis	44.0	55.0	50.9
Tampa	43.1	55.1	49.2
Texarkana	40.1	49.1	41.9
Tulsa	42.4	53.0	48.9
Wichita	42.9	53.9	47.9
Wichita Falls	40.1	49.1	41.9
Week's avg.	42.46	53.78	48.48
Feb. avg.	42.24	53.55	45.73
Jan. avg.	41.87	53.18	45.73
1975 to date	42.16	53.48	
1974 to date	35.10	46.37	

+ Increase, - decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday of each week. They may differ from refiner's prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	26.75-30.00
Premium (99 octane)	28.75-32.00

California (rack) Los Angeles:

Regular (91 octane)	26.00-31.50
Regular (95 octane)	27.10-32.50
Premium (100 octane)	28.40-33.50

Chicago:

Regular (94 octane)	27.50-32.50
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

Distillate No. 1	27.50-33.50
Distillate No. 2	26.50-32.00

Gulf Coast (cargoes):

Kerosine (42-43)	26.25-27.50
Distillate No. 2	26.00-27.00

Mid-Continent (Group 3):

Kerosine (42-44)	27.00-30.25
Diesel oil (58 d.i. & above)	26.50-29.00
Distillate No. 1	26.00-29.25
Distillate No. 2	24.50-26.75

New York Harbor (barges):

Kerosine (42-44)	28.05-32.00
Distillate No. 2	27.05-30.25
Diesel fuel (48-52 d.i.)	27.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

No. 6 (max 1% S)	\$13.86
No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

No. 6 (max. 0.3% S)	\$12.83-14.13
No. 5 (0.3% S)	\$13.03-14.38

API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	3-14 1975	3-7 1975	3-15 1974	3-14 1975	3-7 1975	3-15 1974	3-14 1975	3-7 1975	3-15 1974
Gasoline	200	115	158	10	5	10	210	120	168
Special Naphthas			32					3	32
Kerosine	5	3					5	3	
Distillate	108	135	251	5	5	10	113	140	261
No. 4 Fuel Oil	66	33	135				66	33	135
Residual	999	1,360	1,456	50	75	40	1,049	1,435	1,496
Jet Fuel (Naphtha)	25	25	9			8	25	25	17
Jet Fuel (Kerosine)	52	95	107	43	91	49	95	186	156
Asphalt	5	14	22				5	14	22
LP-Gas	104	112	132	13	24	20	117	136	152
Petrochem Feedstocks	17	15	16				17	15	16
Unfinished	43	26	91	20	5	14	63	31	105
Plant Condensate	88	58	94	5	5	10	93	63	104
Total Prod.	1,712	1,994	2,503	146	210	161	1,858	2,204	2,664
Canadian Crude	361	344	690	157	216	156	518	560	646
Other Foreign	2,311	2,365	1,336	496	313	435	2,807	2,678	1,971
Total Crude	2,072	2,709	2,026	653	529	591	3,325	3,238	2,617
Total imports	4,384	4,703	4,529	799	739	752	5,183	5,442	5,281

Worldwide crude-oil and gas production

OIL (1,000 b/d)	Jan.* 1975	Dec. 1974	12-month average				GAS (billion cubic ft)	
			Daily prod. 1974	Daily prod. 1975	Change from— Vol %		Jan. 75	Dec. 74
WESTERN HEMISPHERE								
Argentina	415	415	423	415	— 8	— 1.9	22.6	22.7
Bolivia	35	55	48	35	— 13	—27.1	11.2	12.8
Brazil	200	195	172	200	28	16.3	4.6	40.
Canada	1,587	1,700	1,823	1,587	— 236	—12.9	282.2	311.7
Chile	30	30	29	30	1	3.4	12.0	19.4
Colombia	160	165	186	160	— 26	—14.0	9.7	10.0
Ecuador	140	136	225	140	— 85	—37.8	0.2	0.2
Mexico	610	600	480	610	130	27.1	64.7	62.0
Peru	75	75	75	75			7.1	6.0
Trinidad	180	180	178	180	2	1.1	4.6	2.5
United States	8,637	8,645	8,907	8,637	— 270	— 3.0	1,831.3	2,011.2
Venezuela	2,748	2,832	3,288	2,748	— 540	—16.4	35.0	45.3
Total	14,817	15,023	15,834	14,817	—1,017	— 6.4	2,285.2	2,567.8
WESTERN EUROPE								
Austria	45	45	50	45	— 5	—10.0	5.2	4.9
Denmark	4	4	1	4	3	300.0		
France	25	26	24	25	1	4.2	23.3	34.6
West Germany	120	120	128	120	— 8	— 6.3	51.1	50.4
Italy	20	20	20	20			36.0	50.0
Netherlands	30	24	28	30	2	7.1	214.9	234.7
Norway	24	46	3	24	21	700.0		
Spain	30	30	44	30	— 14	—31.8		
United Kingdom	2	2	2	2			54.6	68.2
Yugoslavia	65	65	68	65	— 3	— 4.4	3.5	4.7
Total	365	381	368	365	— 3	— 0.8	388.6	447.0
MIDDLE EAST								
Abu Dhabi	770	1,222	1,220	770	— 450	—36.9		
Bahrain	66	67	70	66	— 4	— 5.7	0.2	0.1
Dubai	298	256	140	298	158	47.0		
Iran	5,544	5,915	6,103	5,544	— 559	— 9.2	64.4	76.2
Iraq	1,970	2,162	1,774	1,970	196	11.0	11.0	10.9
Israel	100	100	100	100			0.2	0.2
Kuwait	2,074	2,320	2,838	2,074	— 764	—26.9	7.0	0.1
Oman	290	282	299	290	— 9	— 3.0		
Qatar	514	519	518	514	— 4	— 0.8	0.1	0.1
Saudi Arabia	7,898	8,043	7,517	7,898	381	5.1		
Sharjah	60	60		60				
Syria	155	155	87	155	68	78.2		
Turkey	65	65	64	65	1	1.6		
Total	19,804	21,166	20,730	19,804	— 926	— 4.5	82.9	87.6
ASIA-PACIFIC								
Afghanistan							6.2	7.8
Australia	472	473	389	472	83	21.3	14.3	13.4
Burma	20	20	23	20	— 3	—13.0	0.7	0.6
Brunei-Malaysia	340	330	320	340	20	6.3	1.9	2.2
India	150	150	148	150	2	1.4	2.2	1.6
Indonesia	1,345	1,230	1,416	1,345	— 71	— 5.0	16.7	17.5
Japan	15	15	15	15			7.4	7.1
New Zealand							1.2	1.1
Pakistan	9	9	9	9			12.9	12.2
Taiwan	3	3	3	3			4.7	5.0
Total	2,354	2,230	2,323	2,354	31	1.3	68.2	68.5
AFRICA								
Algeria	800	800	1,150	800	— 350	—30.4	1.4	1.7
Angola	20	20	20	20			5.0	4.7
Cabinda	150	150	148	150	2	1.4		
Congo	35	35	33	35	2	6.1	0.6	0.6
Egypt	175	175	46	175	129	280.4	6.0	5.2
Gabon	190	190	156	190	34	21.8	1.4	1.5
Libya	970	975	1,912	970	— 942	—49.3	4.0	3.1
Morocco	1	1	1	1			0.1	2.5
Nigeria	1,984	2,063	2,198	1,984	— 214	— 9.7	8.8	6.1
Tunisia	105	105	70	105	35	50.0	6.2	6.4
Total	4,430	4,514	5,734	4,430	—1,304	—22.7	33.5	31.8
COMMUNIST								
China	1,300	1,300	1,160	1,300	140	12.1	14.9	15.6
Rumania	290	290	290	290			81.3	80.2
U.S.S.R.†	9,490	9,419	8,955	9,490	535	6.0	864.9	882.5
Other	110	110	110	110			35.0	44.6
Total	11,190	11,119	10,515	11,190	675	6.4	996.1	1,022.9
World Total	52,960	54,433	55,504	52,960	—2,544	— 4.6	3,854.5	4,165.0

*Figures adjusted. †Includes gas liquids. (Note: Thailand, Barbados and others under 500 b/d not included.)

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Canada	1,587	1,700	1,823	1,587	-	236	-12.9	282.2	311.7
Chile	30	30	29	30	-	1	3.4	12.0	19.4
Colombia	160	165	186	160	-	26	-14.0	9.7	10.0
Ecuador	140	136	225	140	-	85	-37.8	0.2	0.2
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Peru	75	75	75	75	-	...	...	7.1	6.0
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Total	14,817	15,023	15,834	14,817	-1,017	- 6.4	2,285.2	2,507.8	
WESTERN EUROPE									
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Denmark	4	4	1	4	-	3	300.0	...	...
France	25	26	24	25	-	1	4.2	23.3	34.6
West Germany	120	120	128	120	-	8	- 6.3	51.1	50.4
Italy	20	20	20	20	-	...	...	36.0	50.0
Netherlands	30	24	28	30	-	2	7.1	214.9	234.2
Norway	24	46	3	24	-	21	700.0	...	...
Spain	30	30	44	30	-	14	-31.8	...	...
United Kingdom	2	2	2	2	-	...	...	54.6	68.2
Yugoslavia	65	65	68	65	-	3	- 4.4	3.5	4.7
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Bahrain	66	67	70	66	-	4	- 5.7	0.2	0.1
Dubai	298	256	140	298	-	158	47.0	...	...
Iran	5,544	5,915	6,103	5,544	-	559	- 9.2	64.4	76.2
Iraq	1,970	2,162	1,774	1,970	-	196	11.0	11.0	10.9
Israel	100	100	100	100	-	...	...	0.2	0.2
Kuwait	2,074	2,320	2,838	2,074	-	764	-26.9	...	...
Oman	290	282	299	290	-	9	- 3.0	...	...
Qatar	514	519	518	514	-	4	- 0.8	0.1	0.1
Saudi Arabia	7,898	8,043	7,517	7,898	-	381	5.1	...	...
Sharjah	60	60	60	60	-	...	...	...	...
Syria	155	155	87	155	-	68	78.2	...	...
Turkey	65	65	64	65	-	1	1.6	...	...
Total	19,804	21,166	20,730	19,804	- 926	- 4.5	82.9	87.6	
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Afghanistan	...	...	...	...	-	...	...	6.2	7.8
Australia	472	473	389	472	-	83	21.3	14.3	13.4
Burma	20	20	23	20	-	3	-13.0	0.7	0.6
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India	150	150	148	150	-	2	1.4	2.2	1.6
Indonesia	1,345	1,230	1,416	1,345	-	71	- 5.0	16.7	17.5
Japan	15	15	15	15	-	...	...	7.4	7.1
New Zealand	...	...	...	...	-	...	...	1.2	1.1
Pakistan	9	9	9	9	-	...	...	12.9	12.2
Taiwan	3	3	3	3	-	...	...	4.7	5.0
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Cabinda	150	150	148	150	-	2	1.4	...	...
Congo	35	35	33	35	-	2	6.1	0.6	0.6
Egypt	175	175	46	175	-	129	280.4	6.0	5.2
Gabon	190	190	156	190	-	34	21.8	1.4	1.5
Libya	970	975	1,912	970	-	942	-49.3	4.0	3.1
Morocco	1	1	1	1	-	...	...	0.1	2.5
Nigeria	1,984	2,063	2,198	1,984	-	214	9.7	8.8	6.1
Tunisia	105	105	70	105	-	35	50.0	6.2	6.4
Total	4,430	4,514	5,734	4,430	-1,304	-22.7	33.5	31.8	
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Rumania	290	290	290	290	-	...	...	81.3	80.2
U.S.S.R.†	9,490	9,419	8,955	9,490	-	535	6.0	864.9	882.5
Other	110	110	110	110	-	...	...	35.0	44.6
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Pittsburgh	41.9	54.9	47.9
Portland, Ore.	41.0	52.0	51.4
Salt Lake City	42.4	53.4	47.9
San Antonio	40.1	49.1	41.9
San Diego	41.5	52.5	50.3
San Francisco	41.5	52.5	51.0
Seattle	40.6	53.6	51.0
Spokane	40.7	53.7	52.1
Springfield, Ill.* ..	44.0	57.0	52.9
St. Louis	44.0	55.0	50.9
Tampa	43.1	55.1	49.2
Texarkana	40.1	49.1	41.9
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Regular (95 octane)	27.10-32.50
Premium (100 octane)	28.40-33.50

Chicago:

Regular (94 octane)	27.50-32.50
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

Distillate No. 1	27.50-33.50
Distillate No. 2	26.50-32.00

Gulf Coast (cargoes):

Kerosine (42-43)	26.25-27.50
Distillate No. 2	26.00-27.00

Mid-Continent (Group 3):

Kerosine (42-44)	27.00-30.25
Diesel oil (58 d.i. & above) ..	26.50-29.00
Distillate No. 1	26.00-29.25
Distillate No. 2	24.50-26.75

New York Harbor (barges):

Kerosine (42-44)	28.05-32.00
Distillate No. 2	27.05-30.25
Diesel fuel (48-52 d.i.)	27.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

No. 6 (max 1% S)	\$13.86
No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

No. 6 (max. 0.3% S)	\$12.83-14.13
No. 5 (0.3% S)	\$13.03-14.38

API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	3-14 1975	3-7 1975	3-15 1974	3-14 1975	3-7 1975	3-15 1974	3-14 1975	3-7 1975	3-15 1974
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Special Naphthas		3	32					3	32
Kerosine	5	3					5	3	
Distillate	108	135	251	5	5	10	113	140	261
No. 4 Fuel Oil	66	33	135				66	33	135
Residual	999	1,360	1,456	50	75	40	1,049	1,435	1,496
Jet Fuel (Naphtha) ..	25	25	9			8	25	25	17
Jet Fuel (Kerosine) ..	52	95	107	43	91	49	95	186	156
Asphalt	5	14	22				5	14	22
LP-Gas	104	112	132	13	24	20	117	136	152
Petrochem Feedstocks ..	17	15	16				17	15	16
Unfinished	43	26	91	20	5	14	63	31	105
Plant Condensate ..	88	58	94	5	5	10	93	63	104
Total Prod.	1,712	1,994	2,503	146	210	161	1,858	2,204	2,664
Canadian Crude	361	344	690	157	216	156	518	560	646
Other Foreign	2,311	2,365	1,336	496	313	435	2,807	2,678	1,971
Total Crude	2,672	2,709	2,026	653	529	591	3,325	3,238	2,617
Total imports ..	4,384	4,703	4,529	799	739	752	5,183	5,442	5,281

Fourth quarter trims '74 profits gain

Earnings of large oil firms top \$13.4 billion in 1974—up 39.8%—but last-quarter profits drop 7.7%. Most executives see delining profits in 1975 due to inflation and to adverse tax and pricing actions.

THE larger American oil companies enjoyed another good year for profits in 1974, but they encountered a set of unfavorable trends indicating that earnings have peaked and are trending down.

Many executives expect 1975 and beyond to be a period of declining earnings, with possible steep inroads from inflation and unfavorable tax and price actions by Government.

The Oil and Gas Journal's survey of leading companies reveals a much slower fourth quarter pulled down potential 1974 earnings for most of the firms. The relatively poorer fourth quarter came after a series of strong quarterly performances.

The down trend is due to declining international earnings, softer domestic demand with accompanying lower product prices, higher taxes, and rising costs. Earnings were bolstered by strong chemical business and better prices for crude oil and natural gas.

The Journal survey shows that the larger companies as a group earned more than \$13.4 billion in 1974, an increase of 39.8% over 1973. The same companies earned \$9.5 billion in 1973, up 54.7% from 1972.

Approximately one-half of the companies surveyed earned less in the last quarter of 1974 than in the last quarter of 1973. The quarterly earnings of the group were 7.7% less than

in 1973. One year ago, these companies were 68.8% ahead of the 1972 fourth quarter.

Downtrend. The outlook for 1975 U.S. oil earnings is fuzzy. Concern is rising over inflation, recession, and the likelihood of higher taxes.

Standard Oil Co. of California board chairman, H. J. Haynes, said his company's earnings outlook is clouded by inflation and by "uncertainties regarding the arrangements under which the company acquires oil from producing countries and the impact of tax changes under consideration by the U.S. and other governments."

"It is safe to say that we have crossed the profit peak and will be

The profits picture for 25 large U.S. oil companies

Company	1974			Thousands of dollars 1974		4th quarter		
	Net profit*	% Change from 1973	% Change 1973 vs. 1972	Without LIFO change Net profit*	% Change from 1973	Net profit*	% Change from 1973	% Change 1973 vs. 1972
Exxon	\$3,140,000	+ 28.5	+ 53.3	\$3,140,000	+ 28.5	\$778,000	- 1.1	+ 69.0
Texaco†	1,586,441	+ 22.8	+ 45.4	1,783,141	+ 18.0	319,779	- 29.5	+ 70.1
Gulf	1,065,000	+ 33.1	+ 79.1	1,065,000	+ 33.1	185,000	- 19.6	+ 98.3
Mobil	1,040,100	+ 22.5	+ 46.8	1,040,100	+ 22.5	136,300	- 51.0	+ 68.2
California Standard†	970,000	+ 15.0	+ 54.2	1,220,000	+ 44.6	293,000	+ 3.5	+ 94.2
Subtotal	7,801,541	+ 25.3	+ 56.1	8,244,247	+ 32.4	1,712,078	- 15.3	+ 45.0
Indiana Standard	970,300	+ 89.8	+ 36.4	970,300	+ 89.8	174,800	+ 43.9	+ 52.7
Shell	620,000	+ 86.5	+ 27.7	620,500	+ 86.5	158,200	+ 99.3	- 1.5
Atlantic Richfield	474,605	+ 75.7	+ 40.3	474,605	+ 75.7	96,293	+ 5.7	+ 47.4
Phillips	425,700	+ 86.5	+ 55.3	429,700	+ 86.5	84,500	- 2.5	+127.6
Sun	378,000	+ 64.4	+ 48.4	378,000	+ 64.4	54,000	- 28.0	+ 59.6
Continental†	327,600	+ 35.0	+ 42.6	398,600	+ 64.2	61,800	- 30.8	+ 91.6
Tenneco	321,468	+ 39.6	+ 13.4	321,468	+ 39.6	76,459	- 5.5	+ 14.4
Union	288,000	+ 89.8	+ 47.8	288,000	+ 59.8	55,500	+ 8.8	+ 55.5
Occidental†	284,000	+256.1	+665.6	341,000	+327.5	NA	NA	NA
Getty†	280,973	+108.1	+ 77.4	280,973	+108.1	58,618	+ 11.4	+115.0
Cities Service†	203,800	+ 50.3	+ 36.8	217,100	+ 60.1	46,400	+ 10.0	+ 49.8
Amerasia Hess	201,858	- 7.6	+177.3	204,858	- 7.6	67,806	- 35.1	+471.9
Marathon†	170,493	+ 31.8	+ 62.2	\$170,493	+ 31.8	40,917	- 27.6	+ 92.8
Ohio Standard	125,900	+ 69.9	+ 24.1	125,900	+ 69.9	28,600	+146.6	- 39.5
Kerr McGee†	116,408	+ 85.3	+ 52.7	126,537	+146.1	30,952	+ 65.3	+ 69.2
Skelly	113,297	+157.6	+ 17.0	113,297	+157.6	35,530	+111.3	+ 31.3
Ashland††	113,000	+ 34.1	+ 25.7	147,700	+ 73.3	38,600	+ 12.2	+ 52.2
American Petrofina†	86,683	+134.6	+104.6	86,683	+134.6	22,418	+ 34.0	+218.2
Murphy†	56,611	+ 37.4	+239.9	81,086	+ 67.3	13,010	- 6.8	+181.0
Clark†	<7,200>	-123.6	+265.6	12,300	- 59.7	<7,600>	-193.8	+140.8
Subtotal	5,565,996	+ 67.0	+ 51.9	5,786,100	+ 73.6	1,137,403	+ 6.7	+ 64.3
TOTAL	13,367,537	+ 39.8	+ 54.7	14,034,341	+ 46.8	2,849,482	- 7.7	+ 68.8

*Excludes nonrecurring gains and losses. †Adopted LIFO inventory accounting for domestic activities in 1974. ‡Includes Getty's share of Mission Corp. and Skelly Oil Co. \$Marathon LIFO change not available. †Fiscal year ending Sept. 30 and first quarter. †Includes revenue of Standard Ohio assets acquired July 1, 1973.

Non-Communist world well completions—1970-1973 (Continued)

Area	Total wells 1973	Total oil wells	Total gas wells	Total footage	Total wildcats 1973	Oil disc.	Gas disc.	Wildcat footage 1973	Total wells 1972	Total wildcats 1972	Total footage 1972	Total wells 1971	Total wells 1970
Netherlands-North Sea	16	0	4	201,000	13	0	3	163,306	18	11	186,000	20	12
Norway-North Sea	17	7	2	207,000	13	4	2	158,288	16	14	188,500	14	15
Spain	19	1	1	170,724	19	1	1	170,724	13	7	146,500	13	0
Spitzbergen	0	0	0	0	0	0	0	0	0	0	0	1	0
Svalbard	1	0	0	11,000	1	0	0	11,000	2	2	17,200	0	0
Sweden	20	0	0	78,000	20	0	0	78,000	20	20	54,000	4	0
Switzerland	1	0	0	3,872	1	0	0	0	0	0	0	0	0
U.K.	19	5	0	87,500	15	0	0	69,075	10	10	63,000	11	8
U.K.-North Sea	76	20	27	745,000	40	11	3	392,120	70	25	722,000	63	58
Total	400	69	137	3,616,218	217	21	25	2,118,626	459	210	4,062,377	418	362
NORTH AFRICA													
Algeria	83	70	10	815,000	13	0	0	165,000	80	10	765,000	109	115
Egypt	46	29	0	343,600	15	2	0	121,200	58	26	446,000	43	67
Libya	74	28	0	467,000	25	3	0	197,000	77	34	661,000	87	250
Morocco	4	0	1	33,667	4	0	1	33,667	7	7	34,238	9	1
Tunisia	15	6	0	135,509	9	0	0	79,545	18	12	175,536	16	6
Total	222	133	11	1,794,776	66	5	1	596,412	240	89	2,081,774	264	409
OTHER AFRICA													
Angola	31	18	1	220,177	8	2	0	71,370	34	15	270,988	55	37
Cameroon	3	1	0	18,723	3	1	0	18,723	5	5	31,736	2	6
Congo	17	14	1	45,378	4	1	1	30,778	43	7	116,358	16	9
Dahomey	2	0	0	14,100	2	0	0	14,100	1	1	5,680	0	4
Ethiopia	5	0	1	19,701	5	0	1	19,701	3	3	0	0	1
Equatorial Guinea	0	0	0	0	0	0	0	0	0	0	0	1	0
Gabon	44	30	2	347,578	15	3	1	124,547	36	17	267,671	36	26
Ghana	1	0	0	3,448	1	0	0	13,448	1	1	75	2	11
Ivory Coast	1	0	0	9,500	1	0	0	9,500	2	2	22,149	0	0
Kenya	0	0	0	0	0	0	0	0	0	0	0	2	1
Liberia	0	0	0	0	0	0	0	0	0	0	0	4	0
Malagasy	2	0	0	20,344	2	0	0	20,344	1	1	9,927	8	1
Mauritania	1	0	0	0	1	0	0	0	1	1	17,215	0	2
Mozambique	0	0	0	0	0	0	0	0	1	1	2,274	7	12
Nigeria	239	184	4	2,414,387	45	22	2	501,418	258	61	2,500,956	207	168
Port Guinea	1	0	0	8,850	1	0	0	8,850	0	0	0	0	0
Senegal	0	0	0	0	0	0	0	0	2	2	17,914	6	5
South Africa	18	0	0	78,582	18	0	0	78,582	10	10	99,451	16	15
Spanish Sahara	1	0	0	6,656	1	0	0	6,656	1	1	6,571	0	1
Togo	0	0	0	0	0	0	0	0	0	0	0	1	1
Zaire	9	6	0	63,476	5	2	0	36,868	6	6	71,821	4	0
Total	375	253	9	3,280,900	112	31	5	954,885	405	134	3,441,749	389	300
MIDDLE EAST													
Abu Dhabi	37	30	0	45,411	7	0	0	76,678	37	21	405,298	19	7
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	1
Dubai	18	14	0	170,595	1	1	0	13,300	16	0	167,953	7	0
Iran	81	57	5	741,000	18	4	3	231,000	61	2	287,432	104	44
Iraq	16	16	0	117,595	0	3	0	28,611	0	0	0	17	6
Israel	2	0	0	23,480	2	0	0	23,480	0	0	0	7	10
Jordan	0	0	0	0	0	0	0	0	0	0	0	3	1
Kuwait	0	0	0	0	0	0	0	0	2	0	24,381	8	13
Neutral Zone	13	13	0	84,667	0	0	0	0	9	0	44,550	12	23
Oman	49	49	0	211,456	0	0	0	0	56	16	257,654	0	27
Qatar	9	8	0	67,458	1	0	0	6,930	8	6	64,632	10	7
Saudi Arabia	323	177	0	2,763,588	3	3	0	25,668	178	6	1,522,968	56	43
Sharjah	2	2	0	29,071	0	0	0	0	2	1	19,611	2	0
Turkey	59	28	1	400,452	30	6	0	65,220	56	29	403,368	48	60
Total	609	394	6	5,049,733	65	17	3	470,887	425	81	3,197,847	293	254
FAR EAST													
Brunei	3	0	0	20,193	3	0	0	20,193	2	2	11,030	0	4
Burma	4	0	0	39,255	4	0	0	39,255	3	3	35,741	0	3
India	5	2	2	30,918	4	2	2	16,168	5	3	20,008	0	0
Indonesia	501	275	31	2,250,571	169	21	7	1,004,578	312	137	1,171,000	422	84
Japan	40	2	4	324,800	36	2	1	292,320	10	10	98,347	4	107
Korea	5	0	0	38,589	5	0	0	38,589	0	0	0	0	0
Khmer	0	0	0	0	0	0	0	0	1	1	7,997	0	0
Malaysia	14	5	0	136,668	11	2	0	107,378	20	20	141,066	12	14
Pakistan	2	0	1	16,053	2	0	1	16,053	8	8	51,802	4	7
Philippines	11	0	0	68,986	11	0	0	68,986	9	9	50,232	17	2
Taiwan	22	1	1	220,337	22	1	1	220,337	6	6	74,444	9	5
Thailand	8	1	1	61,667	8	1	1	61,667	6	6	40,147	1	0
Timor	0	0	0	0	0	0	0	0	3	3	16,173	3	4
Total	615	286	40	3,208,037	275	27	13	1,805,524	385	208	1,717,987	472	230
OCEANIA													
Australia-Papua-New Guinea	83	3	16	646,274	67	0	3	511,657	139	93	1,072,893	98	125
New Zealand	0	0	0	0	0	0	0	0	11	11	56,470	9	9
Total	83	3	16	646,274	67	0	3	511,657	150	104	1,059,363	107	134
NORTH AMERICA													
Canada	4,621	975	1,640	16,776,595	2,219	199	567	8,419,550	3,548	1,633	13,223,396	3,175	3,108
U.S.	27,602	9,902	6,385	138,937,944	7,466	619	900	44,776,906	28,755	7,539	138,285,876	25,851	28,120
Total	32,223	10,877	8,025	155,714,539	9,685	818	1,467	53,196,456	32,303	9,172	151,509,272	29,026	31,228
GRAND TOTAL	38,647	13,274	8,343	187,118,220	10,975	1,021	1,561	63,202,138	36,501	10,540	181,429,050	33,327	35,278

Non-Communist world well completions—1970-1973

Area	Total wells 1973	Total oil wells	Total gas wells	Total footage	Total wildcats 1973	Oil disc.	Gas disc.	Wildcat footage 1973	Total wells 1972	Total wildcats 1972	Total footage 1972	Total wells 1971	Total wells 1970
LATIN AMERICA													
Argentina	597	328	54	3,137,559	139	19	17	304,326	623	110	3,458,432	595	579
Bahamas	0	0	0	0	0	0	0	0	0	0	0	0	2
Barbados	0	0	0	0	0	0	0	0	0	0	0	2	0
Belize	3	0	0	14,664	3	0	0	14,664	5	5	23,907	0	0
Bolivia	14	8	2	90,689	4	1	2	30,390	14	8	189,294	18	33
Brazil	128	40	3	781,065	78	15	2	601,597	179	80	946,345	175	177
Chile	61	18	3	369,249	20	0	3	138,455	72	33	491,395	81	66
Colombia	46	27	3	366,513	20	2	3	209,703	56	20	423,860	71	58
Dominican Republic	0	0	0	0	0	0	0	0	0	0	0	0	2
Ecuador	58	49	0	529,672	8	2	0	66,888	59	20	459,993	81	37
Guatemala	0	0	0	0	0	0	0	0	1	1	11,781	0	0
Guyana	0	0	0	0	0	0	0	0	0	0	0	1	0
Honduras	3	0	0	31,940	3	0	0	31,940	3	3	24,952	1	0
Jamaica	0	0	0	0	0	0	0	0	1	1	7,608	0	1
Mexico	422	182	24	3,434,747	104	12	12	1,033,419	431	143	3,727,563	516	502
Nicaragua	0	0	0	0	0	0	0	0	0	0	0	3	8
Paraguay	0	0	0	0	0	0	0	0	6	6	21,232	11	0
Peru	89	66	0	789,332	31	15	0	376,418	117	25	696,151	121	135
Surinam	0	0	0	0	0	0	0	0	0	0	0	1	7
Trinidad-Tobago	212	175	10	955,622	15	3	5	113,860	196	23	837,678	220	135
Venezuela	427	366	0	3,306,691	63	33	0	546,031	371	64	3,038,490	464	589
Total	2,060	1,259	99	13,807,743	488	102	44	3,467,691	2,134	542	14,358,661	2,361	2,331
EUROPE													
Austria	74	29	24	454,332	21	2	4	182,181	74	21	401,339	53	60
Denmark-North Sea	4	0	0	36,000	4	0	0	36,000	3	1	10,800	3	3
Eire	4	0	1	37,000	4	0	1	37,000	3	3	32,780	3	0
France	14	4	1	174,720	11	2	0	137,284	27	11	162,248	11	17
Germany	47	3	20	463,045	22	1	3	201,202	48	26	513,095	62	59
Greece	3	0	0	27,500	3	0	0	27,500	2	2	12,745	1	2
Italy	35	0	11	445,110	24	0	4	389,391	77	43	843,170	94	89
Malta	1	0	0	7,250	1	0	0	7,250	3	3	25,000	1	0
Netherlands	49	0	46	466,285	5	0	3	49,305	73	12	684,000	64	39

(Continued on next page)

at a well in San Patricio County's White Point field. Mobil 1 Jones Unit in East White Point, 5 miles west of Portland, flowed 1,726 Mcfd and 144 bbl condensate daily on 14/64-in. choke from perforations at 12,215-12,318 ft.

A RECOMPLETION in South Texas opened a new gas sand for a new fault-block portion of East Jeffress field.

New well is in Hidalgo County, 5 miles southwest of McCook in Porcion 74, A-582. Well is the Coastal States Gas Co. 1 Castillo. Flow was 2,100 Mcfd and 14 bbl condensate daily from perforations at 11,145-11,472 ft in the Vicksburg Oligocene T, fault block A zone. Well originally paid at 12,043-12,130 ft in the Vicksburg-T sand.

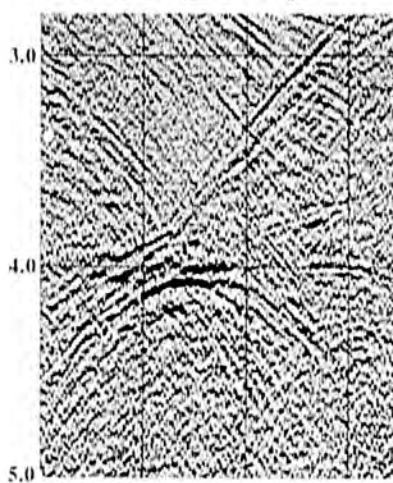
The second well in North Julian field, Kenedy County, is also a success. Richard E. Haas completed 2 Clark & Sain in the 9,300-ft Frio Oligocene pay. Flow was 860,000 cfd and 13 bbl condensate through 12/64-in. choke.

Pay is at 9,172-81 ft. Location is 1 mile east of the discovery well, completed late last year.

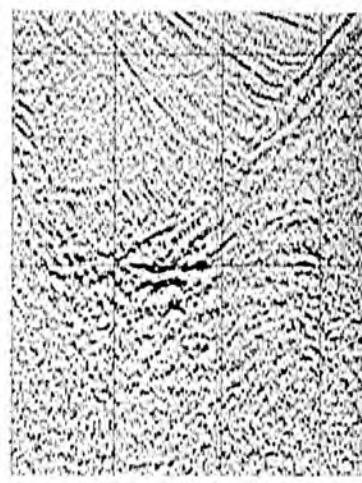
WAVE EQUATION MIGRATION

Digicon successfully applies the Claerbout wave equation to the migration of conventional CDP stacked exploration data. This advanced development is one example of Digicon's high

technology processing capability. Migration processing is available at any Digicon processing center: HOUSTON; SINGAPORE; and LONDON. You get more with Digicon.



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Table 19.--Profit record of 27 large U. S. oil companies,
first nine months of 1973 relative to 1972.

Company	Profits (\$1,000)*			
	9 Months 1974	% Change From 1973	3rd Qtr 1974	% Change From 1973
Exxon	2,280,000	+ 37.7	800,000	+ 25.4
Texaco	1,428,162	+ 70.2	378,391	+ 23.1
Mobil	903,800	+ 58.2	277,800	+ 20.2
Calif. Standard	877,736	+ 56.6	299,506	+ 32.6
Gulf	815,000	+ 43.0	275,000	+ 31.0
SUBTOTAL	6,304,698	+ 50.2	2,070,697	+ 25.9
Indiana Standard	795,500	+104.1	296,500	+101.3
Shell	462,300	+ 82.5	216,000	+158.4
ARCO	377,712	+111.6	144,042	+140.9
Conoco	329,800	+115.0	120,200	+121.8
Sun	323,848	+109.1	105,675	+ 84.5
Phillips	317,600	+121.1	112,900	+109.6
Occidental	247,209	+360.2	86,834	+297.3
Tenneco	245,007	+ 64.1	73,405	+ 37.8
Union	232,500	+ 80.1	79,900	+ 57.6
Getty†	222,355	+169.8	86,526	+171.9
Cities Service	168,400	+ 80.1	45,800	+ 75.5
Amerada Hess	134,052	+ 17.7	38,203	- 12.9
Marathon	129,576	+ 77.7	48,745	+ 49.9
Pennzoil	113,983	+ 95.7	33,703	+ 80.3
Sohio	97,000	+ 55.2	37,000	+105.6
Kerr-McGee	93,154	+111.2	32,153	+143.7
Ashland‡	78,700	+ 27.1	27,300	+ 14.2
Skelly	77,800	+155.2	31,100	+280.0
American Petrofina	64,265	+217.8	31,944	+247.6
Murphy	55,615	+ 60.8	12,189	- 19.7
Clark	19,165	- 14.5	<3,435>	-137.5
Commonwealth	12,910	- 23.8	<14,772>	-281.3
SUBTOTAL	4,598,451	+ 98.5	1,641,912	+ 95.5
TOTAL	10,903,149	+ 67.4	3,672,609	+ 49.8

*Excludes nonrecurring gains and losses. †Includes Getty's share in Mississin Corp. and Skelly. ‡Calendar-year basis.

Source: Oil and Gas Journal, November 11, 1974

Worldwide crude-oil and gas production

OIL (1,000 b/d)	Dec.* 1974	Nov. 1974	Daily prod. 1973	12-month Daily prod. 1974	average		GAS (billion cu ft)		
					Change from Vol	%	Dec. 1974	Nov. 1974	1974 Total
WESTERN HEMISPHERE									
Argentina	415.0	415.0	420.0	413.0	- 7.0	- 1.7	22.7	25.2	278.4
Bolivia	50.0	50.0	47.0	49.0	2.0	4.3	12.8	12.9	152.2
Brazil	195.0	195.0	166.0	179.0	13.0	7.8	4.0	4.2	47.3
Canada	1,700.0	1,468.0	1,727.0	1,690.0	-107.0	- 6.0	311.7	301.7	3,341.7
Chile	30.0	30.0	32.0	29.0	- 3.0	- 9.4	19.4	19.2	212.3
Colombia	165.0	165.0	195.0	173.0	- 22.0	-11.3	10.0	10.1	105.8
Ecuador	55.0	56.0	218.0	153.0	- 65.0	-29.8	0.2	0.3	5.3
Mexico	600.0	600.0	465.0	551.0	86.0	18.5	62.0	58.6	686.4
Peru	75.0	75.0	71.0	76.0	5.0	7.0	6.0	6.5	73.3
Trinidad	180.0	180.0	166.0	178.0	12.0	7.2	2.5	4.8	65.0
United States	8,645.0	8,647.0	9,187.0	8,812.0	-375.0	- 4.1	2,011.2	1,971.2	22,376.9
Venezuela	2,832.0	2,818.0	3,366.0	2,976.0	-390.0	-11.6	45.3	45.0	1,456.5
Total	14,942.0	14,699.0	16,130.0	15,279.0	-851.0	- 5.3	2,507.8	2,459.7	28,801.1
WESTERN EUROPE									
Austria	45.0	45.0	49.0	46.0	- 3.0	- 6.1	4.9	5.2	87.6
Denmark	4.0	4.0	4.0	3.0	- 1.0	-25.0	0	0	0
France	25.0	25.0	26.0	23.0	- 3.0	-11.5	34.6	32.3	303.6
West Germany	120.0	121.0	129.0	121.0	- 8.0	- 6.2	50.4	51.6	674.1
Italy	20.0	20.0	19.0	19.0	0	0	50.0	33.0	572.2
Netherlands	24.0	24.0	29.0	30.0	1.0	3.4	234.2	241.7	2,867.5
Norway	46.0	57.0	32.0	35.0	3.0	9.4	0	0	0
Spain	30.0	30.0	15.0	37.0	22.0	146.7	0	0	0
United Kingdom	2.0	2.0	2.0	2.0	0	0	68.2	71.1	1,207.2
Yugoslavia	65.0	65.0	67.0	67.0	0	0	4.7	5.2	54.6
Total	381.0	393.0	372.0	383.0	11.0	2.9	447.0	440.1	5,766.8
MIDDLE EAST									
Abu Dhabi	1,222.0	1,204.0	1,299.0	1,412.0	113.0	8.7	0	0	0
Bahrain	67.0	67.0	68.0	67.0	- 1.0	- 1.5	0.1	0.1	3.3
Dubai	256.0	268.0	220.0	239.0	19.0	8.6	0	0	0
Iran	5,915.0	6,015.0	5,860.0	6,026.0	166.0	2.8	76.2	75.4	906.2
Iraq	2,162.0	1,812.0	1,954.0	1,850.0	-104.0	- 5.3	10.9	11.1	129.3
Israel	100.0	100.0	88.0	100.0	12.0	13.6	0.2	0.2	4.2
Kuwait	2,320.0	2,546.0	3,024.0	2,546.0	-478.0	-15.8	0.1	0.1	1.6
Oman	282.0	281.0	293.0	290.0	- 3.0	- 1.0	0	0	0
Qatar	519.0	519.0	570.0	518.0	- 52.0	- 9.1	0.1	0.1	1.7
Saudi Arabia	8,043.0	8,818.0	7,607.0	8,481.0	874.0	11.5	0	0	0
Sharjah†	60.0	60.0	30.0	30.0	0	0	0	0	0
Syria	155.0	155.0	105.0	132.0	27.0	25.7	0	0	0
Turkey	65.0	65.0	67.0	65.0	- 2.0	- 3.0	0	0	0
Total	21,166.0	21,910.0	21,155.0	21,756.0	601.0	2.8	87.6	87.0	1,046.3
ASIA-PACIFIC									
Afghanistan							7.8	7.6	92.8
Australia	473.0	459.0	369.0	389.0	20.0	5.4	13.4	14.2	160.1
Burma	20.0	20.0	20.0	20.0	0	0	0.6	0.6	6.1
Brunei-Malaysia	330.0	330.0	320.0	328.0	8.0	2.5	2.2	0.9	5.1
India	150.0	150.0	147.0	149.0	2.0	1.4	1.6	1.4	18.5
Indonesia	1,230.0	1,250.0	1,324.0	1,396.0	72.0	5.4	17.5	18.2	160.8
Japan	15.0	15.0	14.0	15.0	1.0	7.1	7.1	7.2	95.5
New Zealand							1.1	1.1	13.2
Pakistan	9.0	9.0	9.0	9.0	0	0	12.2	14.0	141.9
Taiwan	3.0	3.0	2.0	3.0	1.0	50.0	5.0	4.2	46.2
Thailand	0.2	0.2	0.2	0.2	0	0	0	0	0
Total	2,230.2	2,236.2	2,205.2	2,309.2	104.0	4.7	68.5	68.3	740.2
AFRICA									
Algeria	800.0	800.0	1,090.0	986.0	-104.0	- 9.5	1.7	1.8	20.6
Angola	50.0	20.0	17.0	20.0	3.0	17.6	4.7	5.2	40.7
Cabinda	150.0	150.0	145.0	149.0	4.0	2.8	0	0	0
Congo	35.0	35.0	42.0	32.0	- 10.0	-23.8	0.6	0.7	6.1
Egypt	175.0	175.0	167.0	144.0	- 23.0	-13.8	5.2	4.6	49.7
Gabon	190.0	190.0	151.0	177.0	26.0	17.2	1.5	1.5	15.2
Libya	975.0	961.0	2,187.0	1,491.0	-696.0	-31.8	2.1	3.2	41.0
Morocco	1.0	1.0	1.0	1.0	0	0	2.5	1.8	29.0
Nigeria	2,063.0	2,238.0	2,056.0	2,256.0	200.0	9.7	6.1	5.0	60.0
Tunisia	105.0	105.0	82.0	88.0	6.0	7.3	6.4	2.9	20.7
Total	4,514.0	4,675.0	5,938.0	5,344.0	-594.0	-10.0	31.8	26.7	283.0
COMMUNIST									
China	1,200.0	1,200.0	1,060.0	1,200.0	140.0	13.2	15.6	14.8	187.5
Rumania	290.0	290.0	290.0	290.0	0	0	80.2	77.8	935.7
U.S.S.R.†	9,419.0	9,441.0	8,576.0	9,176.0	600.0	7.0	882.5	811.2	9,213.3
Other	110.0	110.0	100.0	110.0	10.0	10.0	44.6	41.2	500.8
Total	11,019.0	11,041.0	10,026.0	10,776.0	750.0	7.5	1,022.9	945.0	10,837.3
World Total	54,252.2	54,954.2	55,826.0	55,847.2	21.0	0.04	4,165.6	4,026.8	47,474.7

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax	Pump price	Pump price
	2-18-75	2-18-75	2-19-74
Albany	44.9	56.9	47.9
Albuquerque	42.4	53.4	47.9
Amarillo	40.1	49.1	39.9
Atlanta	42.1	53.6	46.4
Baltimore	41.9	54.9	46.9
Birmingham	41.9	53.9	45.9
Boston*	42.1	53.6	46.4
Buffalo	44.9	56.9	47.9
Charlotte	41.9	54.9	46.9
Cheyenne	44.9	55.9	46.9
Chicago*	43.6	56.6	48.4
Cleveland	42.9	53.9	45.9
Corpus Christi	40.6	49.6	41.1
Dallas	40.6	49.6	41.1
Denver	43.9	54.9	48.9
+ Des Moines	43.0	54.0	46.9
Detroit	41.5	54.5	47.9
Fort Worth	40.6	49.6	41.1
Houston	40.6	49.6	41.1
Indianapolis	43.9	55.9	47.9
Jacksonville	41.9	53.9	45.9
Kansas City	43.4	54.4	47.9
+ Little Rock	41.5	53.0	45.9
Louisville	44.9	55.9	47.9
- Los Angeles	40.7	51.7	44.3
+ Memphis	43.0	54.0	46.9
Miami	41.6	53.6	46.4
Milwaukee	43.9	54.9	46.9
+ Minn.-St. Paul	44.0	55.0	47.9
Newark	43.6	54.6	47.4
New Orleans	40.9	52.9	44.9
New York*	45.9	58.9	50.9
Norfolk	39.6	52.6	45.4
+ Okla. City	42.4	53.0	45.9
Omaha	43.4	55.9	47.9
Philadelphia	41.9	54.9	45.9
+ Phoenix	43.6	54.6	44.9
Pittsburgh	41.9	54.9	45.9
- Portland, Ore.	41.5	52.5	45.9
Salt Lake City	42.4	53.4	46.9
San Antonio	40.1	49.1	39.9
- San Diego	41.3	52.3	44.3
+ San Francisco	41.5	52.5	45.3
Seattle	40.8	53.8	46.1
+ Spokane	40.9	53.9	47.1
+ Springfield, Ill.*	44.0	57.0	49.9
+ St. Louis	44.0	55.0	47.9
Tampa	41.6	53.6	46.4
Texarkana	40.1	49.1	39.9
+ Tulsa	42.4	53.0	45.9
Wichita	42.9	53.2	45.9
Wichita Falls	40.1	49.1	39.9
Week's avg.	42.31	53.62	45.88
Jan. avg.	41.87	53.18	45.73
Dec. avg.	41.42	52.74	42.02
1975 to date	41.99	53.30	
1974 to date	34.43	45.70	

+ Increase, - decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday of each week. They may differ from refiner's prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	26.75-30.00
Premium (99 octane)	28.75-32.00

California (rack) Los Angeles:

Regular (91 octane)	26.00-31.50
Regular (95 octane)	27.10-32.50
Premium (100 octane)	28.40-33.50

Chicago:

Regular (94 octane)	27.50-32.50
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

Distillate No. 1	27.50-33.50
Distillate No. 2	26.50-32.00

Gulf Coast (cargoes):

Kerosine (42-43)	27.25-28.75
Distillate No. 2	26.00-27.00

Mid-Continent (Group 3):

Kerosine (42-44)	28.00-30.25
Diesel oil (58 d.i. & above)	27.50-30.00
Distillate No. 1	27.00-29.75
Distillate No. 2	26.00-27.75

New York Harbor (barges):

Kerosine (42-44)	28.05-32.00
Distillate No. 2	25.35-30.25
Diesel fuel (48-52 d.i.)	27.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

No. 6 (max. 1% S)	\$13.86
No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

No. 6 (max. 0.3% S)	\$12.95-14.13
No. 5 (0.3% S)	\$13.15-14.38

API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	2-14	2-7	2-15	2-14	2-7	2-15	2-14	2-7	2-15
	1975	1975	1974	1975	1975	1974	1975	1975	1974
Gasoline	102	154	118	5	5		107	159	118
Special Naphthas	3						3		
Kerosine	3	5					3	5	
Distillate	167	190	234	5	5	10	172	195	244
No. 4 Fuel Oil	102	63	70				102	63	70
Residual	1,348	1,379	1,670	75	60	50	1,423	1,439	1,720
Jet Fuel (Naphtha)	25	40			5	6	25	45	6
Jet Fuel (Kerosine)	110	87	69	65	50	48	175	137	117
Asphalt	5		28				5		28
LP-Gas	122	136	137	22	21	13	144	157	150
Petrochem Feedstocks	15	17					15	17	
Unfinished	38	100	92	15		22	53	100	114
Plant Condensate	84	129	103	5	5	7	89	134	110
Total Prod.	2,124	2,300	2,521	192	151	156	2,316	2,451	2,677
Canadian Crude	401	543	646	192	142	160	593	685	806
Other Foreign	2,652	2,305	727	354	972	368	3,006	3,277	1,095
Total Crude	3,053	2,848	1,373	546	1,114	528	3,599	3,962	1,901
Total imports	5,177	5,148	3,894	738	1,265	684	5,915	6,413	4,578

Worldwide crude-oil and gas production

OIL (1,000 b/d)	Nov. 1974*	Oct. 1974	11-month average				GAS (billion cu ft)		
			Daily prod. 1973	Daily prod. 1974	Change from Vol %		Nov. 1974	Oct. 1974	Cum. 1974
WESTERN HEMISPHERE									
Argentina	415.0	415.0	420.0	413.0	- 7.0	- 1.7	25.2	26.4	255.7
Bolivia	50.0	50.0	47.0	49.0	2.0	4.3	12.9	13.4	139.4
Brazil	195.0	195.0	166.0	177.0	11.0	6.6	4.2	3.7	43.3
Canada	1,468.0	1,597.0	1,794.0	1,689.0	-105.0	- 5.9	301.7	291.7	3,030.0
Chile	30.0	30.0	32.0	29.0	- 3.0	- 9.4	19.2	20.1	192.9
Colombia	165.0	165.0	196.0	174.0	- 22.0	-11.2	10.1	9.7	95.8
Ecuador	56.0	95.0	216.0	162.0	- 54.0	-25.0	0.3	0.4	5.1
Mexico	600.0	600.0	464.0	547.0	83.0	17.9	58.6	58.9	624.4
Peru	75.0	75.0	70.0	76.0	6.0	8.6	6.5	6.6	67.3
Trinidad	180.0	180.0	165.0	178.0	13.0	7.9	4.8	5.0	62.5
United States	8,647.0	8,777.0	9,201.0	8,838.0	-363.0	- 3.9	1,971.2	1,911.2	20,365.7
Venezuela	2,805.0	2,810.0	3,365.0	2,986.0	-379.0	-11.3	45.0	45.0	1,411.2
Total	14,686.0	14,989.0	16,136.0	15,318.0	-818.0	- 5.1	2,459.7	2,392.1	26,293.3
WESTERN EUROPE									
Austria	45.0	45.0	49.0	46.0	- 3.0	- 6.1	5.2	4.9	82.7
Denmark	4.0	4.0	4.0	2.0	- 2.0	-50.0	0	0	0
France	25.0	25.0	26.0	24.0	- 2.0	- 7.7	32.3	18.6	269.0
West Germany	120.0	120.0	129.0	122.0	- 7.0	- 5.4	51.6	50.4	623.7
Italy	20.0	20.0	20.0	19.0	- 1.0	- 5.0	33.0	32.9	522.2
Netherlands	24.0	39.0	29.0	31.0	2.0	6.9	241.7	234.2	2,633.3
Norway	57.0	44.0	35.0	33.0	- 2.0	- 5.7	0	0	0
Spain	30.0	30.0	15.0	37.0	22.0	146.7	0	0	0
United Kingdom	2.0	2.0	2.0	2.0	....	....	71.1	69.9	1,139.0
Yugoslavia	65.0	65.0	67.0	67.0	....	....	5.2	4.7	49.9
Total	392.0	394.0	376.0	383.0	7.0	1.8	440.1	415.6	5,319.8
MIDDLE EAST									
Abu Dhabi	1,204.0	1,169.0	1,325.0	1,430.0	105.0	7.9	0	0	0
Bahrain	67.0	68.0	68.0	67.0	- 1.0	- 1.5	0.1	0.1	3.2
Dubai	268.0	262.0	227.0	248.0	21.0	9.3	0	0	0
Iran	6,015.0	5,720.0	5,841.0	6,036.0	195.0	3.3	75.4	74.2	830.0
Iraq	1,812.0	1,877.0	1,937.0	1,821.0	-116.0	- 6.0	11.1	11.2	118.4
Israel	100.0	100.0	92.0	100.0	8.0	8.7	0.2	0.2	4.0
Kuwait	2,546.0	2,060.0	3,067.0	2,567.0	-500.0	-16.3	0.1	0.1	1.5
Oman	281.0	280.0	292.0	291.0	- 1.0	- 0.3	0	0	0
Qatar	520.0	525.0	580.0	519.0	- 61.0	-10.5	0.1	0.1	1.6
Saudi Arabia	8,818.0	9,052.0	7,699.0	8,522.0	823.0	10.7	0	0	0
Sharjah†	60.0	60.0	60.0	17.0	17.0	....	0	0	0
Syria	155.0	155.0	104.0	130.0	26.0	25.0	0	0	0
Turkey	65.0	65.0	67.0	65.0	- 2.0	- 3.0	0	0	0
Total	21,911.0	21,393.0	21,299.0	21,813.0	514.0	2.4	87.0	85.9	958.7
ASIA-PACIFIC									
Afghanistan	0	0	0	0	0	0	7.6	7.8	85.0
Australia	459.0	465.0	369.0	381.0	12.0	3.3	14.2	15.6	146.7
Burma	20.0	20.0	20.0	20.0	....	....	0.6	0.6	5.5
Brunei-Malaysia	365.0	365.0	318.0	341.0	23.0	7.2	0.9	0.8	2.9
India	150.0	150.0	147.0	149.0	2.0	1.4	1.4	1.5	16.9
Indonesia	1,135.0	1,250.0	1,317.0	1,386.0	69.0	5.2	18.2	17.1	143.3
Japan	15.0	15.0	14.0	15.0	1.0	7.1	7.2	7.1	88.4
Pakistan	9.0	9.0	9.0	9.0	....	....	14.0	13.9	129.7
Taiwan	3.0	3.0	2.0	3.0	1.0	50.0	4.2	4.3	41.2
Thailand	0.2	0.2	0.2	0.2	....	....	0	0	0
Total	2,156.2	2,277.2	2,196.2	2,304.2	108.0	4.9	68.3	68.7	659.6
AFRICA									
Algeria	900.0	900.0	1,107.0	1,045.0	- 62.0	- 5.6	1.8	1.7	18.9
Angola	20.0	20.0	17.0	20.0	3.0	17.6	5.2	5.1	36.0
Cabinda	150.0	150.0	144.0	149.0	5.0	3.5	0	0	0
Congo	35.0	35.0	41.0	35.0	- 6.0	-14.6	0.7	0.6	5.5
Egypt	175.0	175.0	178.0	141.0	- 37.0	-20.8	4.6	4.7	44.5
Gabon	190.0	190.0	146.0	177.0	31.0	21.2	1.5	1.5	13.7
Libya	961.0	1,069.0	2,226.0	1,539.0	-687.0	-30.9	3.2	3.1	37.9
Morocco	1.0	1.0	1.0	1.0	....	....	1.8	1.9	26.5
Nigeria	2,300.0	2,325.0	2,036.0	2,280.0	244.0	12.0	5.0	4.7	53.9
Tunisia	105.0	105.0	82.0	86.0	4.0	4.9	2.9	3.0	14.3
Total	4,837.0	4,970.0	5,978.0	5,473.0	-505.0	- 8.4	26.7	26.3	251.2
COMMUNIST									
China	1,200.0	1,200.0	1,060.0	1,200.0	140.0	13.2	14.8	15.6	171.9
Rumania	290.0	290.0	290.0	290.0	....	....	77.8	77.9	855.5
U.S.S.R.†	9,441.0	9,369.0	8,558.0	9,158.0	600.0	7.0	811.2	808.4	8,365.4
Other	110.0	110.0	100.0	110.0	10.0	10.0	41.2	38.7	456.2
Total	11,041.0	10,969.0	10,008.0	10,758.0	750.0	7.5	945.0	940.6	9,849.0
World Total	55,023.2	54,992.2	55,993.2	56,049.2	56.0	0.1	4,026.8	3,929.2	43,331.6

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax 1-21-75	Pump price 1-21-75	Pump price 1-22-74
Albany	44.9	56.9	49.9
Albuquerque	42.4	53.4	43.9
+ Amarillo	40.1	49.1	39.9
Atlanta	42.1	53.6	45.4
Baltimore	41.9	54.9	48.9
Birmingham	41.9	53.9	47.9
Boston*	42.1	53.6	45.4
Buffalo	44.9	56.9	49.9
Charlotte	41.9	54.9	48.9
Cheyenne	44.9	55.9	49.9
Chicago*	43.6	56.6	50.4
Cleveland	42.9	53.9	47.9
+ Corpus Christi	40.6	49.6	39.9
+ Dallas	40.6	49.6	39.9
Denver	43.9	54.9	48.9
Des Moines	41.0	52.0	43.9
Detroit	41.5	54.5	49.9
+ Fort Worth	40.6	49.6	39.9
+ Houston	40.6	49.6	39.9
Indianapolis	43.9	55.9	49.9
Jacksonville	41.9	53.9	47.9
Kansas City	43.4	54.4	47.9
Little Rock	39.5	51.0	42.9
Louisville	44.9	55.9	49.9
Los Angeles	40.7	51.7	43.9
Memphis	41.0	52.0	43.9
Miami	41.6	53.6	45.4
Milwaukee	43.9	54.9	48.9
Minn.-St. Paul	42.0	53.0	44.9
Newark	43.6	54.6	46.4
New Orleans	40.9	52.9	46.9
New York*	45.9	58.9	52.9
Norfolk	39.6	52.6	44.4
Okla. City	41.8	52.4	42.9
Omaha	43.4	55.9	49.9
Philadelphia	41.9	54.9	47.9
Phoenix	43.9	54.9	44.9
Pittsburgh	41.9	54.9	47.9
Portland, Ore.	41.9	52.9	44.1
Salt Lake City	42.4	53.4	46.9
+ San Antonio	40.1	49.1	39.9
San Diego	41.3	52.3	43.9
San Francisco	41.4	52.4	44.9
Seattle	40.5	53.5	45.9
Spokane	40.5	53.5	46.9
Springfield, Ill.*	42.0	55.0	46.9
St. Louis	43.9	54.9	48.9
Tampa	41.6	53.6	45.4
+ Texarkana	40.1	49.1	39.9
Tulsa	40.4	51.0	42.9
Wichita	42.9	53.9	47.9
+ Wichita Falls	40.1	49.1	39.9
Week's avg.	42.06	53.37	45.86
Dec. avg.	41.42	52.74	42.02
Nov. avg.	41.11	52.42	40.35
1975 to date	41.81	53.12	
1974 to date	34.39	45.67	

+ Increase, - decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday of each week. They may differ from refiner's prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	26.75-30.00
Premium (99 octane)	28.75-32.00

California (rack) Los Angeles:

Regular (91 octane)	25.00-31.50
Regular (95 octane)	26.10-32.50
Premium (100 octane)	27.40-33.50

Chicago:

Regular (94 octane)	27.50-32.50
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

Distillate No. 1	27.50-33.50
Distillate No. 2	26.50-32.00

Gulf Coast (cargoes):

Kerosine (42-43)	29.00-31.00
Distillate No. 2	28.00-29.00

Mid-Continent (Group 3):

Kerosine (42-44)	28.00-30.25
Diesel oil (58 d.i. & above)	27.50-30.00
Distillate No. 1	27.00-29.75
Distillate No. 2	26.00-27.75

New York Harbor (barges):

Kerosine (42-44)	28.05-32.00
Distillate No. 2	25.35-30.25
Diesel fuel (48-52 d.i.)	27.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

No. 6 (max. 1% S)	\$13.86
No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

+ No. 6 (max. 0.3% S)	\$13.03-14.13
+ No. 5 (0.3% S)	\$13.25-14.38

API imports of crude and products

	(Thousands of barrels daily)								
	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	1-17 1975	1-10 1975	1-18 1974	1-17 1975	1-10 1975	1-18 1974	1-17 1975	1-10 1975	1-18 1974
Gasoline	138	142	116	5	5		143	147	116
Special Naphthas									
Kerosine	6	5	4				6	5	4
Distillate	370	260	358	5	5	10	375	265	368
No. 4 Fuel Oil	87	67	75				87	67	75
Residual	1,721	1,856	1,586	60	60	100	1,781	1,916	1,686
Jet Fuel (Naphtha)	40	40	11	5	5	7	45	45	18
Jet Fuel (Kerosine)	63	69	110	55	57	60	118	126	170
Asphalt	6	8	28				6	8	28
LP-Gas	135	131	98	22	23	12	157	154	110
Petrochem. Feedstocks	15	15					15	15	
Unfinished	107	45	102		25	32	107	70	134
Plant Condensate	64	77	96	5	5	6	69	82	102
Total Prod.	2,752	2,715	2,584	157	185	227	2,909	2,900	2,811
Canadian Crude	498	328	696	184	192	157	682	520	853
Other Foreign	2,623	2,234	1,199	497	440	119	3,120	2,674	1,318
Total Crude	3,121	2,562	1,895	681	632	276	3,802	3,194	2,171
Total Imports	5,873	5,277	4,479	838	817	503	6,711	6,094	4,982

Total wells drilled in the United States*—December 1974†

State-district	Data compiled by API							Total exploratory wells‡				
	Total completions							Oil‡	Gas§	Dry holes	Total wildcats	Footage
Oil‡	Gas§	Dry holes	Total wells	Total footage	Total wells all types||	Total footage||						
Alabama	1	2	6	9	78,129	9	78,129	...	1	5	6	48,254
Alaska	5		1	6	54,356	6	54,356	1		1	2	18,541
Onshore	3		1	4	40,739	4	40,739	1		1	2	18,541
Offshore	2			2	13,617	2	13,617					
Arkansas	18	4	27	41	217,984	41	217,984	...	1	9	10	66,934
California	222	11	38	27	700,544	322	771,273	6	2	27	35	210,002
North	1	8	19	28	154,236	28	154,236		2	14	16	87,878
Central Coastal	29		1	30	112,204	32	120,430	4		1	5	31,012
East central	186	2	18	206	396,984	251	436,815	2		12	14	91,112
South	2			2	7,487	5	29,359					
Offshore	4	1		5	29,633	6	30,433					
Colorado	17	19	45	81	491,127	81	491,127		2	30	32	184,020
Florida			2	2	19,008	2	19,008			1	1	6,646
Illinois	72	2	87	161	404,640	170	420,340	5	1	35	41	113,871
Indiana	10	2	18	30	48,733	30	48,733	1		10	11	21,169
Kansas	85	34	111	230	735,899	253	777,591	9	7	59	75	262,895
Kentucky	9	7	24	40	58,535	43	63,283	1		12	13	17,888
Louisiana	87	66	143	296	2,353,464	324	2,370,954	4	14	69	87	879,269
North	36	19	43	98	433,188	125	444,840	1	3	22	26	196,336
South	39	36	82	157	1,507,158	157	1,507,158	3	11	38	52	603,873
Offshore	12	11	18	41	413,118	42	418,956			9	9	79,060
Michigan	10	9	18	37	185,625	37	185,625	5	3	15	23	108,916
Mississippi	3	6	26	35	242,437	35	242,437	1		24	25	196,717
Missouri	7		2	9	5,636	59	8,995			2	2	4,868
Montana	10	36	57	113	294,727	113	294,727	2	5	44	51	142,702
Nebraska	2		18	20	99,213	20	99,213	2		12	14	66,408
New Mexico	41	31	21	93	527,560	93	527,560	2	3	14	19	142,292
East	32	11	17	60	398,238	60	398,238	2	3	12	17	132,344
West	9	20	4	33	129,322	33	129,322			2	2	9,948
New York	28	43	33	104	288,276	111	297,658		19	28	47	185,852
North Carolina			1	1	5,348	1	5,348			1	1	5,348
North Dakota	8		9	17	107,368	17	107,368	3		8	11	61,824
Ohio	60	142	25	227	920,717	227	920,717	3	29	4	36	159,790
Oklahoma	181	86	138	405	2,087,201	416	2,114,650	8	3	34	45	289,545
Pennsylvania	38	44	5	87	212,486	88	214,416	1	3	4	8	21,453
South Dakota			1	1	2,342	1	2,342			1	1	2,342
Tennessee	11	3	12	26	40,749	26	40,749	3	3	11	17	26,994
Texas	367	183	312	862	4,428,245	902	4,521,237	28	65	184	277	1,708,273
Dist. 1	14	10	9	33	118,490	34	120,395		5	8	13	59,302
Dist. 2	9	35	31	75	440,844	75	440,844	2	18	19	39	238,182
Dist. 3	53	17	31	101	561,140	101	561,140	7	11	18	36	304,111
Dist. 4	26	39	36	101	606,476	101	606,476	6	7	18	31	165,526
Dist. 5	4	4	8	16	84,711	17	85,825		2	5	7	29,501
Dist. 6	7	5	16	28	170,392	32	190,302		1	9	10	55,050
Dist. 7B	27	10	62	99	345,022	105	354,155	1		34	35	152,410
Dist. 7C	18	22	62	62	307,365	62	307,365	2		14	16	71,837
Dist. 8	76	10	10	96	615,241	105	638,382	2	4	7	13	132,984
Dist. 8A	56		15	71	395,222	89	431,961			8	8	73,809
Dist. 9	72	20	46	138	463,991	139	465,041	8	12	26	46	229,696
Dist. 10	5	6	15	26	187,417	26	187,417		2	7	9	80,371
Offshore		5	11	16	131,934	16	131,934	3	11	14	14	115,494
Utah	6	5	7	18	134,903	18	134,903	1	2	5	8	54,719
Virginia		17		17	85,571	17	85,571		6		6	31,443
West Virginia	8	38	10	56	180,849	58	180,849		2	7	9	36,496
Wyoming	41	1	64	106	678,221	108	679,961	5	1	48	54	383,917
Gulf of Mexico—Northern			3	3	19,199	3	19,199			3	3	19,199
Total—Dec. 1974	1,339	791	1,274	3,404	15,707,092	3,629	15,994,303	91	172	707	970	5,478,587
Total—Nov. 1974	1,088	626	1,053	2,767	11,794,937	2,906	12,027,247	58	82	582	722	3,930,077
Total 1974	12,718	7,200	11,930	31,848	151,651,515	33,070	154,236,372	813	1,186	6,761	8,760	51,069,932
Total 1973	9,902	6,385	10,305	26,592	131,391,452	27,602	138,937,944	619	900	5,947	7,466	44,776,906

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Nov. 23, 1974, through Dec. 27, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests and outpost (extension) tests. ||Includes 63 strat tests and 162 service wells, 12,679 and 274,532 ft, respectively.

Offshore bidding seminars slated

A SERIES of seminars will be held in February by ECON Inc. of New Jersey.

This series on offshore oil bidding will be held in the Royal Orleans Hotel in New Orleans on Feb. 13, the Houston Oaks on Feb. 18, and at the Dallas Hilton on Feb. 20. Meetings begin at 9 a.m. Contact John Andrews at 609-924-8778, ECON, Princeton, N.J.

MAPS

TWO oil and gas field maps of two of the country's most active drilling areas have been updated.

Map. 43, "Southeast United States Map Showing Jurassic Trend" and Map 2, "Official Oil and Gas fields of Oklahoma and Texas Panhandle" are available from E. C. Jacobson Co., 315 Mayo Bldg., Tulsa 74103. These maps show oil fields in green, gas fields in red with official names. Also shown are counties, county seats, township and range.

OKLAHOMA

ANOTHER field has been tapped in Central Oklahoma's busy Canadian County.

New area was found by Samedan Oil Co. at 1 Johnson estate in S $\frac{1}{2}$ N $\frac{1}{2}$ S $\frac{1}{2}$ NW 26-11n-10w. Flow was 3,912 Mcfd through 11/64-in. choke and 4 $\frac{1}{2}$ bbl oil in 8 hr. Pay is from the Morrow Pennsylvanian through perforations at 12,314 ft. Open flow was 6,000 Mcfd.

In another important Oklahoma development, Helmerich & Payne will drill north of its Arbuckle Cambro-Ordovician discovery in Beckham County. This western area well will be the 1 Cupp-1 in S $\frac{1}{2}$ S $\frac{1}{2}$ NE SW 22-10n-26w.

IRAN

ON p. 140 of the Dec. 30, 1974, issue of the Journal, the cumulative production figure for Lapco's Sassan field in Iran should read 313,623,494 bbl rather than 102,556,000 bbl.

This changes total Iranian cumulative to 18,972,000,310 bbl rather than 18,760,932,816 bbl.

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	Nov. 10-14	Calgary
Economic Eval.	Mar. 24-28	Denver
	May 12-16	Calgary
	Oct. 13-17	Denver
Res. Engr. I	Oct. 20-31	Denver
Res. Engr. II	Nov. 3-14	Denver
Res. Simul. I	May 19-29	Denver

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\$50,000,000

Houston Natural Gas Corporation

9 $\frac{3}{4}$ % Sinking Fund Debentures due February 1, 1995

Price 100%

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January 22, 1975

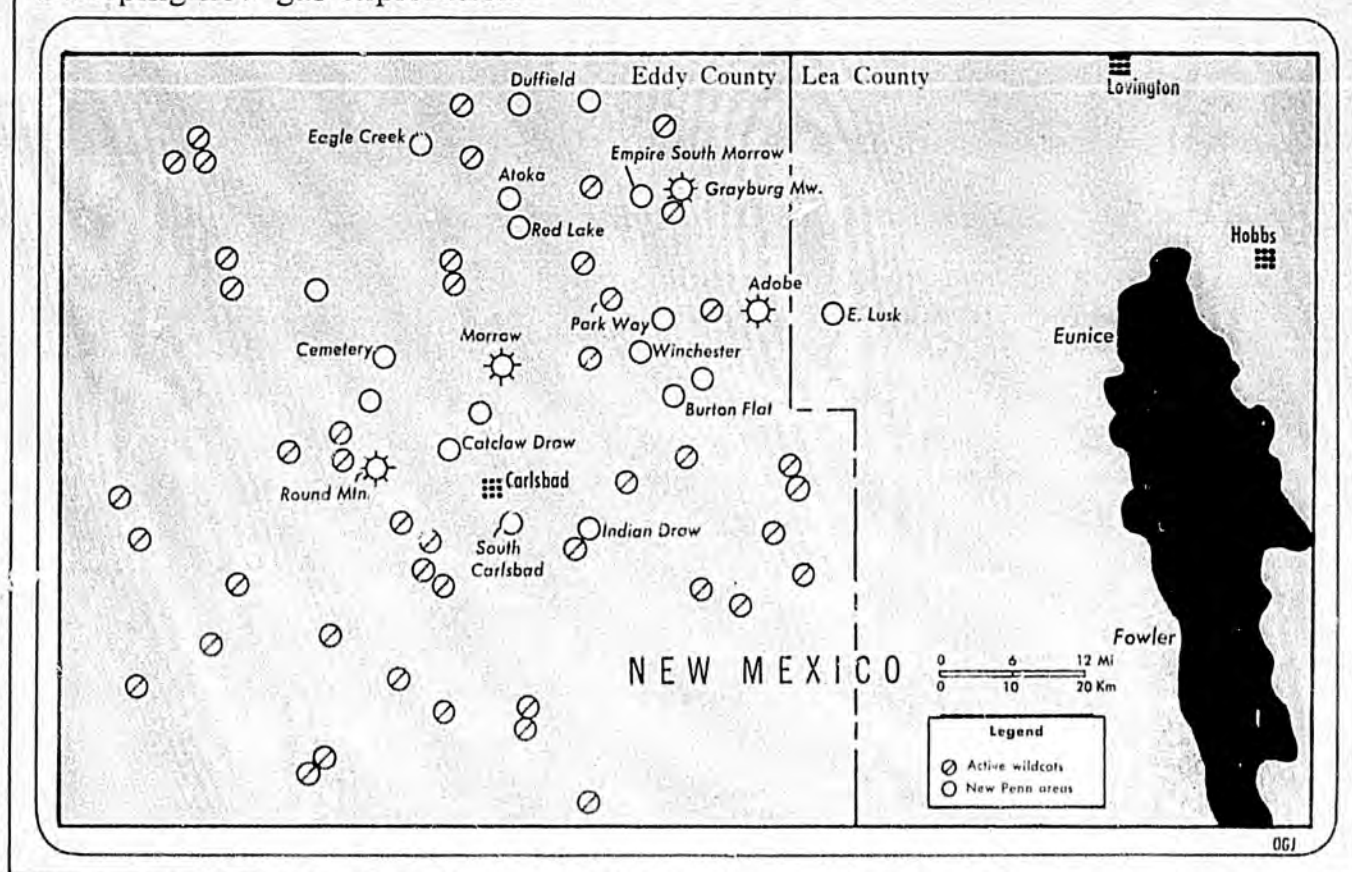
Total wells drilled in the United States*—November 1974†

Data compiled by API

State-district	Total completions						Total exploratory wells‡					
	Oil‡	Gas§	Dry holes	Total wells	Total footage	Total wells all types||	Total footage||	Oil‡	Gas§	Dry holes	Total wildcats	Footage
Alabama		2	4	6	54,599	6	54,599			2	2	20,555
Arkansas	7	3	11	21	113,061	21	113,061			5	5	26,323
California	101	6	29	136	358,600	164	388,956	1	3	24	28	131,368
North		6	14	20	115,612	20	115,612		3	12	15	88,618
Central Coastal	10		2	12	41,271	14	44,343			2	2	8,625
East Central	77		13	90	164,639	116	191,923	1		10	11	34,125
South	9			9	20,928	9	20,928					
Offshore	5			5	16,150	5	16,150					
Colorado	10	15	31	56	349,087	56	349,087	3	4	24	31	189,560
Florida			2	2	25,684	2	25,684			2	2	25,684
Illinois	31		52	83	207,357	87	215,217	2		21	23	60,876
Indiana	15	1	25	41	76,744	42	78,814	2		15	17	35,648
Kansas	102	16	130	248	736,551	276	771,940	8	3	62	73	283,038
Kentucky	23	6	45	74	102,012	80	109,007	1	1	22	24	33,125
Louisiana	59	44	95	198	1,261,221	201	1,271,427	1	3	58	62	471,740
North	32	32	49	113	476,336	115	477,806	1	3	28	32	164,026
South	15	4	30	49	459,982	49	459,982			17	17	197,777
Offshore	12	8	16	36	324,903	37	333,639			13	13	109,937
Michigan	13	4	14	31	162,221	34	171,406	6	3	7	16	85,907
Mississippi	4	1	24	29	228,820	29	228,820	2		15	17	129,641
Missouri			4	4	9,992	13	11,640			4	4	9,992
Montana		21	36	57	143,375	57	143,375		7	28	35	97,339
Nebraska	2		17	19	95,738	19	95,738	1		15	16	78,228
Nevada			1	1	11,000	1	11,000			1	1	11,000
New Mexico	30	29	17	76	359,551	76	359,551	3	2	13	19	88,131
East	24	9	11	44	234,003	44	234,003	2	2	8	12	67,137
West	6	20	6	32	125,548	32	125,548	1		5	6	20,994
New York	21	43	6	70	170,537	75	177,577					
North Dakota	1		9	10	76,007	10	76,007			8	8	56,592
Ohio	69	130	24	223	895,585	224	895,795		2	7	9	40,406
Oklahoma	90	46	75	211	1,093,840	224	1,123,983	4	5	18	27	164,004
Pennsylvania	103	67	9	179	369,277	202	411,838	2	5	5	12	39,091
Tennessee	3	3	5	11	17,144	11	17,144	1	2	4	7	11,017
Texas	352	121	334	807	4,112,389	821	4,157,446	19	33	185	237	1,504,909
Dist. 1	37	21	28	86	329,874	91	340,858	2	9	19	30	137,446
Dist. 2	6	14	26	46	282,334	47	289,342	1	7	18	26	170,307
Dist. 3	33	6	33	72	443,682	72	443,682	2	1	23	26	209,861
Dist. 4	11	17	15	43	252,735	43	252,735		5	10	15	101,577
Dist. 5	2		11	13	79,407	13	79,407			8	8	63,202
Dist. 6	3	12	8	23	204,137	23	204,137		2	7	9	91,741
Dist. 7B	24	14	82	120	385,120	120	385,120	2	4	36	42	155,156
Dist. 7C	26	15	31	72	401,975	72	401,975	4		16	20	95,529
Dist. 8	91	9	26	126	727,809	128	733,474	3	3	10	16	167,268
Dist. 8A	54		13	67	383,205	71	398,764	2		8	10	67,877
Dist. 9	52	5	39	96	307,298	98	313,139	2		14	16	80,093
Dist. 10	13	8	15	36	260,482	36	260,482	1	2	9	12	110,521
Offshore			7	7	54,331	7	54,331			7	7	54,331
Utah	3		7	10	49,758	10	49,758			6	6	27,853
Virginia		8		8	37,230	8	37,230					
West Virginia	33	58	9	100	277,259	100	277,259	1	7	2	10	33,943
Wyoming	16	2	36	54	391,163	55	394,753	1	2	27	30	264,972
Gulf of Mexico—Northern			2	2	9,135	2	9,135			2	2	9,135
Total—Nov. 1974	1,088	626	1,053	2,767	11,794,937	2,906	12,027,247	58	82	582	722	3,930,077
Total—Oct. 1974	1,131	551	1,241	2,923	14,080,534	3,054	14,392,760	67	93	661	821	4,779,364
Cum. 1974	11,379	6,409	10,656	28,444	135,944,423	29,441	138,242,069	722	1,014	6,054	7,790	45,531,345
Cum. 1973	8,805	5,535	9,134	23,474	118,185,567	24,438	120,422,776	558	744	5,269	6,571	

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Oct. 26, 1974, through Nov. 22, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests and outpost (extension) tests. ||Includes 24 strat tests and 115 service wells, 8,102 and 224,208 ft., respectively.

Sweeping new gas exploration



No letup signs seen for Eddy County drilling

THE standard industry symbol for showing an active gas well or gas field is colored red.

Eddy County and adjoining Southeast New Mexican areas on the activity maps these days are nearly covered with red ink. Not since the early days of the Permian basin oil and gas industry has this corner of the Southwest seen so much action. The accompanying map tells the story with its multitude of drilling sites and new Pennsylvanian areas. Only Eddy is discussed here, but the adjoining Lea and Chaves areas are also quite busy. Wildcat symbols are the only ones shown on this map. It would be impossible to dot all of the active field wells in the area.

From Chaves County. Although Chaves County is not shown on this map, it lies just to the north of Eddy County.

The southern portion of this New Mexico area is also in on the gas ex-

ploration. Depco, Inc. 1 Toles-Federal, a 9,300-ft wildcat in southeastern Chaves, 10 miles east of Lake Arthur, was recently completed as a Morrow Pennsylvanian gas discovery. Flow was 1,612 Mcfd with gas-liquid ratio of 22,000:1. New strike is in 25-15s-27e, 1½ miles southeast of Atoka gas at Buffalo Valley. Perforations were made at 8,930-38 ft.

From Chaves County the drilling swath moves into Eddy County. Many discoveries have been made in recent months. Some of the newer ones include Tenneco Oil Co.'s 1 Federal Com. "33," the second well and ¾-mile south extension to Grayburg Morrow field. This Morrow gas area is 5 miles southwest of Loco Hills town. Flow was 15,408 Mcfd from perforations in the Morrow at 10,761-10,804 ft. Well is in 33-17s-29e.

Another well is Adobe Oil Co. 1 Hannafin State Com., a workover well 12 miles southeast of Loco Hills town

in eastern Eddy. Flow was 572,000 cu ft from Morrow perforations at 11,719-12,225 ft. This well is 3 miles northwest of dual Strawn oil and Morrow gas production in Lusk field.

Monsanto Co. 1 Round Mountain is a new gas discovery for Eddy in 28-21s-25e. Flow here was 1,859 Mcfd from the Morrow through perforations at 10,358-59 ft.

To prolific Lea County. The Southeast New Mexico Pennsylvanian gas play has also popped up in Lea County, the prolific area where most of New Mexico's oil production lies.

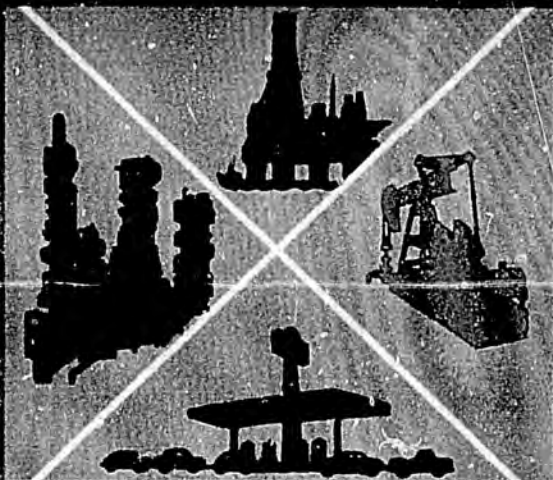
There are several wildcats drilling for Morrow gas in the western part of the county that are not shown on the map. But the area from Carlsbad northeast in Eddy County is where most of the action is concentrated. This Pennsylvanian program has been under way several years, but the big push was in 1974. And, there are no signs of any letup in 1975.

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FORECAST/REVIEW

AN OIL & GAS JOURNAL SPECIAL REPORT

Uncertainties plague '75 outlook for oil



AMERICANS face some hard decisions early in the new year on their consumption of petroleum products—decisions which make the outlook for demand highly uncertain.

The Ford Administration has made it clear that some form of restriction on consumption will be imposed to reduce the nation's use of high-cost imported oil and products. The most often mentioned goal is a reduction of 1 million b/d.

But just what form the restriction on consumption will take is not clear. Reports have mentioned higher tariff on imports, compulsory allocations, high taxes on crude or products especially on gasoline, or even gasoline

rationing.

It's also not clear what base period will be used for the reduction—whether the cutback will be from 1974 actual import levels or the expected 1975 levels.

Turnaround? The base period used will determine the severity of the impact on the nation's economy.

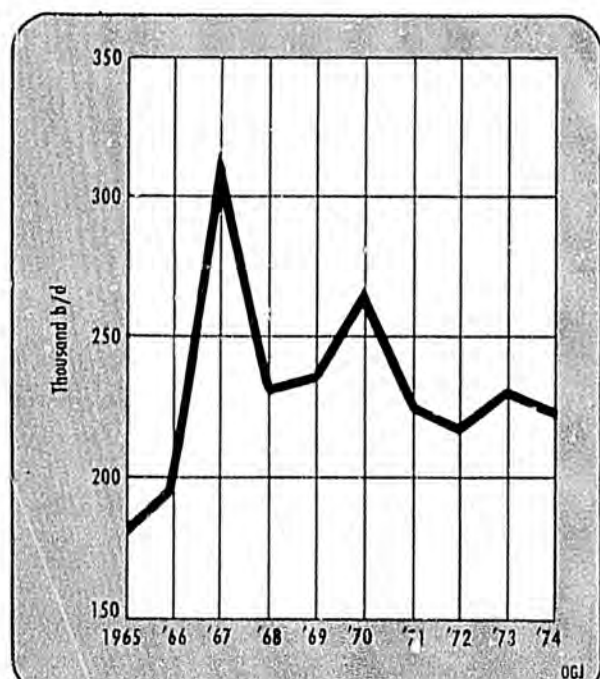
The normal outlook is for petroleum demand in this country to turn upward again in 1975 after a historic decline in 1974. But since domestic production of oil and gas will continue to drop, the nation must rely more heavily on imports of high-priced crude and products this year to fill the gap.

This means that a 1-million-b/d cut-

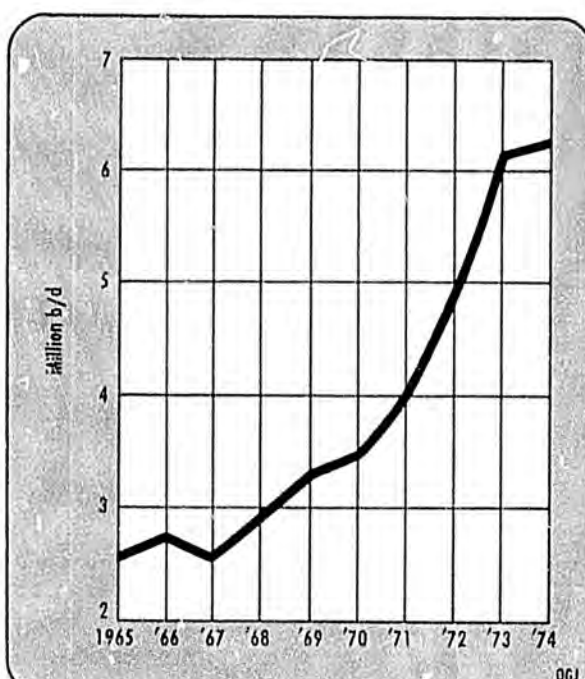
back from the 1974 import levels actually will represent a 1.4-million-b/d reduction from the expected 1975 import volumes. This would wipe out any growth in demand for 1975 and return consumption near the 1971 levels. But if the reduction is taken from anticipated 1975 levels, the actual impact would amount to only about 710,000 b/d less than in 1974.

In either case, the reduction would force considerable belt tightening throughout the economy. Motorists and householders would be faced with higher prices for the gasoline and heating oils they will be allowed to use. Industries and businesses where energy is an important item would find their

Exports turn down



Total imports level



costs increased. The result would be further disruptions to an economy which is torn between an inflation or recession scenario.

What to expect. The uncertainty of governmental action makes any forecast of 1975 supply-demand for petroleum a hazardous exercise.

Journal editors believe that total domestic demand for 1975 would average 17,035,000 b/d or 1.8% higher than last year without giving consideration to federal compulsory conservation measures.

This would represent a turnaround from 1974 when demand averaged 16,735,000 b/d, a 3.1% decline from 1973 and the first time since World War II that petroleum demand has failed to show an increase. The decline reflected the tail end of the Arab embargo on oil shipments to this country and the effect of soaring prices for imported oil and products.

With ample crude oil now available on world markets—if buyers are willing or able to pay the high prices—Journal editors feel that demand will recover slightly from 1974 levels.

Oil economists last October, in estimating this turnaround, forecast a 4% gain for demand in 1975 over 1974, but economic events since have prompted most of them to pare this estimate sharply. The continuing slump in new auto sales, failure of housing to increase, growing numbers of unem-

ployed, and the deepening of depressing factors throughout the economy make about a 2% gain in demand more probable. Winter weather so far also has not been as severe as anticipated thus keeping consumption of heating oils lower than expected.

But even this 1.8% growth will be reversed if the administration imposes some form of compulsory conservation of energy.

More problems. As for individual products, no shortages are anticipated under normal considerations, but 1975 probably will be far from normal.

Government policy could scramble the outlook. Federal policy, for example, likely will emphasize reducing the volume of imported products over crude since they are more expensive than crude oil and would represent greater dollar savings. Also, policy for domestic consumption likely will emphasize reduction in the use of gasoline.

This double policy poses problems for the petroleum industry. Refiners will need the imported crude to operate their plants at necessary capacities, but they also will still need to import a heavy volume of residual particularly and in some cases middle distillates. The residual-making capacity of domestic refiners is limited. Also, refiners in processing a barrel of crude are forced by the nature of their plant arrangements to make

from 40-45% gasoline, even while maximizing output of middle distillates or residual. If gasoline consumption thus is severely restricted, refiners may find themselves with gasoline overflowing storage and unable to sell it.

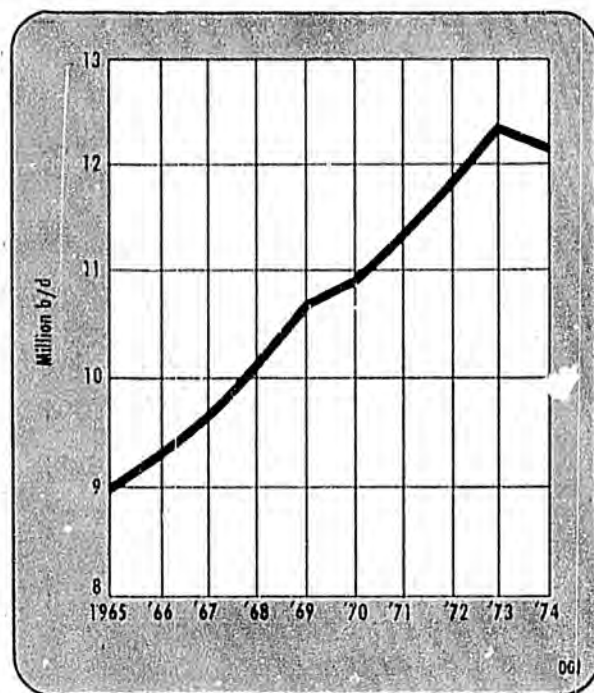
A look at '74. The year 1974 closed after setting historical trends under pressure from the Arab embargo, government regulations, and price changes throughout the petroleum industry.

Preliminary calculations indicate that supply exceeded demand in the U.S. during 1974. This allowed for some stock building to occur, with the possible exception of distillate and kerosene inventories. Estimates are 16,960,000 b/d for demand and 17,245,000 b/d for supply. These estimates yield reductions of 3.1% and 2.2%, respectively, when compared with 1973.

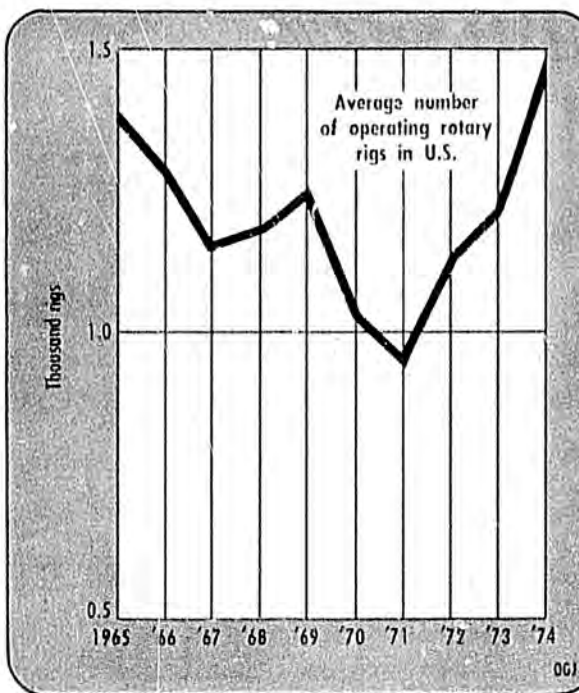
The supply came from domestic production of 10,495,000 b/d, including 8,800,000 b/d of crude and condensate and 1,695,000 b/d of natural-gas liquids. Imports added another 6,275,000 b/d, with crude shipments averaging 3,500,000 b/d and products 2,775,000 b/d.

Demand for the major products included gasoline consumption of 6,560,000 b/d, jet fuels 980,000 b/d, distillates 3,060,000 b/d (including kerosene), and residual 2,665,000 b/d. Do-

Crude runs break upward trend



U.S. rig activity revives



mestic demand totaled 16,735,000 b/d with exports of 225,000 b/d during the year.

A look at '75. Imports and governmental involvement are the key questions that are currently unresolved for the 1975 outlook.

Many analysts are adopting a "wait and see" attitude in hopes that Washington policies will be more clearly defined before they settle on a forecast for 1975. However, most industry economists are predicting that normal demand will range from zero growth to a high of about 3%.

Journal editors are forecasting gasoline demand will average 6,625,000 b/d during 1975. This 1.0% increase over 1974 fails to bring gasoline demand back to the level reached in 1973. The major consideration influencing gasoline demand is the sales of new autos. Presently, new-car sales are very depressed. Sales closely follow auto production which closed the year 1974 down 24%. This factor may be tempered somewhat by recreational gasoline use. Drivers are becoming more accustomed to the current price level of motor gasoline and are expected to drive more unless new restraints are imposed.

Jet fuels are expected to increase by 1.1% over the calculated level for 1974. This increase puts aviation fuels back at their 1971 level of consumption. U.S. airline activity was at one

of its lowest levels for both passenger and freight service in the month of November. Slight strength began to show in December air traffic, and some restoration of flights is expected during 1975.

Heating oils. The cold winter that was expected to force distillate demand up so far has failed to materialize. Even so, distillate demand (including kerosene) is forecast at 3,140,000 b/d. This is a relatively healthy increase of 2.6% in comparison with 1974. Continued declines in natural-gas production are expected to contribute to this increase. Factors which tend to moderate distillate demand include price-induced conservation measures being put to use by homeowners and businesses and the sluggish economy.

Residual-fuel-oil demand for 1975 is projected to increase 2.8% after decreasing 4.6% during 1974. This will place residual consumption at an average of 2,740,000 b/d for 1975 or about 75,000 b/d over calculated 1974 levels. The shortage of natural gas also is exerting an upward force on residual consumption.

Other product categories—liquefied gases, petrochemical feedstocks, lubricants, asphalt, petroleum coke, etc.—are expected to increase about 2.5% in 1975. This level of demand would be 3,540,000 b/d, up 70,000 b/d from the calculated consumption in 1974.

Exports are projected by the Jour-

nal to decrease by 10,000 b/d, a decline of 4.4% from 1974. This is expected to happen as some suppliers with long-term contracts for primary products allow their contracts to expire. Most of the exports in this category are prohibited in the U.S. because of environmental considerations. Coke accounts for over 50% of the exports from the U.S.

Lubricants are the other major segment of the exports.

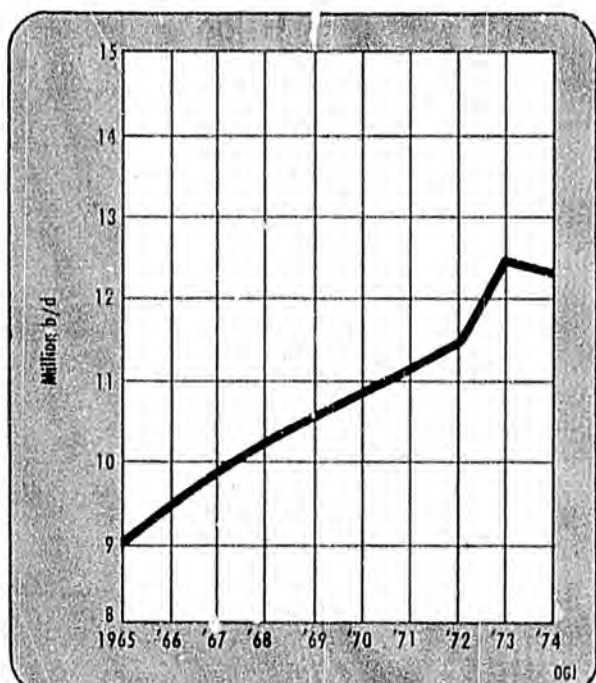
Rely on imports. The big supply question for 1975 is the same as it was in 1974—the level of imports.

The Journal forecast counts on the import level to reach an average of 6,675,000 b/d, including 3,800,000 b/d of crude and 2,875,000 b/d of refined products and unfinished petroleum. This import level will satisfy demand as well as allow for a small buildup in inventories.

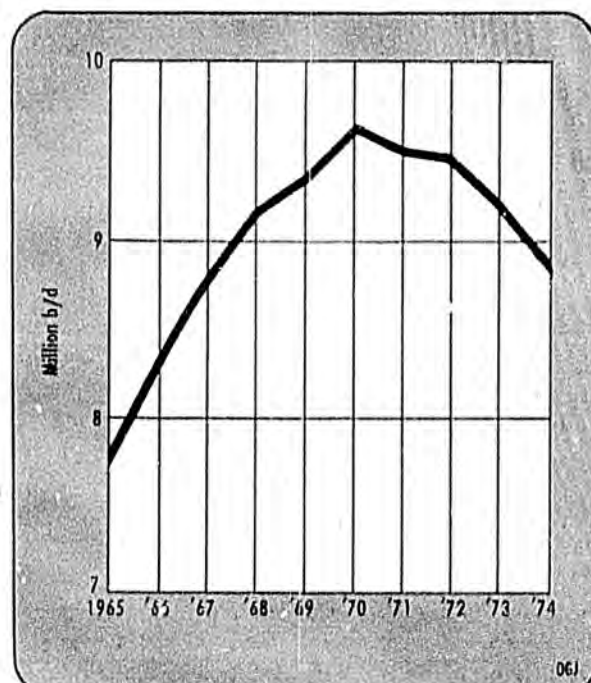
Crude production in the U.S. is expected to continue its decline in 1975 but at a slower rate than in 1974. Production should average 8,550,000 b/d in 1975. This level of production is 2.8% less than in 1974. The decline between 1974 and 1973 amounted to 4.2%.

The lag time between increased drilling activities and the corresponding increase in crude-production rates has been longer than most industry analysts foresaw. It appears that the slowing decline rate is significant and

New U.S. crude supply



Crude production declines



Journal forecast: supply and demand

	(Thousands of Barrels Daily)					
	Forecast Preliminary	1974	% Change	1973	1972	1971
Domestic Demand						
Motor Gasoline	6,625	6,560	+1.0	6,673	6,376	6,014
Dist. 1-4	5,665	5,610	+1.0	5,702	5,439	5,145
Dist. 5	960	950	+1.0	971	937	869
Naphtha Jet	205	200	+2.5	217	242	249
Dist. 1-4	143	140	+2.1	152	156	164
Dist. 5	62	60	+3.3	65	86	85
Kerosine Jet	785	780	+0.6	833	803	743
Dist. 1-4	560	560		594	568	524
Dist. 5	225	220	+2.3	239	235	219
Other Kerosine	165	160	+3.1	216	234	249
Dist. 1-4	155	152	+2.0	212	230	244
Dist. 5	10	8	+25.0	4	4	5
Distillate	2,975	2,900	+2.6	3,080	2,913	2,694
Dist. 1-4	2,705	2,635	+2.7	2,770	2,641	2,428
Dist. 5	270	265	+1.9	310	272	266
Residual	2,740	2,665	+2.8	2,794	2,529	2,232
Dist. 1-4	2,320	2,255	+2.9	2,373	2,208	1,936
Dist. 5	420	410	+2.4	421	321	296
LP-Gas and LRG	1,400	1,370	+2.2	1,121	1,118	1,011
Dist. 1-4	1,338	1,310	+2.1	1,064	1,057	949
Dist. 5	62	60	+3.3	57	61	62
Misc. Product Demand	2,140	2,100	+1.9	2,333	2,164	2,033
Dist. 1-4	1,820	1,785	+2.0	2,078	1,918	1,796
Dist. 5	320	315	+1.6	255	246	237
Total Domestic Demand	17,035	16,735	+1.8	17,267	16,379	15,225
Dist. 1-4	14,706	14,447	+1.8	14,945	14,217	13,186
Dist. 5	2,329	2,288	+1.8	2,322	2,162	2,039
Exports	215	225	-4.4	229	223	224
Dist. 1-4	120	130	-7.7	129	135	134
Dist. 5	95	95	0	100	88	90
Total Demand	17,250	16,960	+1.7	17,496	16,602	15,449
Dist. 1-4	14,826	14,577	+1.7	15,074	14,352	13,320
Dist. 5	2,424	2,383	+1.7	2,422	2,250	2,129
Supply						
Crude and Lease Cond.	8,550	8,800	-2.8	9,187	9,441	9,463
Dist. 1-4	7,485	7,723	-3.1	8,065	8,289	8,270
Dist. 5	1,065	1,077	-1.1	1,122	1,152	1,193
NGL and Other HC	1,670	1,695	-1.5	1,738	1,744	1,692
Dist. 1-4	1,637	1,661	-1.4	1,702	1,703	1,644
Dist. 5	33	34	-2.9	36	41	48
Imports Crude	3,800	3,500	+8.6	3,244	2,216	1,681
Dist. 1-4	2,964	2,730	+8.6	2,434	1,553	1,169
Dist. 5	836	770	+8.6	810	663	512
Products & Unfinished	2,875	2,775	+3.6	2,957	2,525	2,245
Dist. 1-4	2,670	2,575	+3.7	2,775	2,368	2,095
Dist. 5	205	200	+2.5	182	157	150
Processing Gain, Losses, Etc.	495	475	+4.2	505	444	439
Dist. 1-4	410	390	+5.1	409	357	353
Dist. 5	85	85	0	96	87	86
Total Supply	17,390	17,245	+0.8	17,631	16,370	15,520
Dist. 1-4	15,166	15,079	+0.6	15,385	14,270	13,531
Dist. 5	2,224	2,166	+2.7	2,246	2,100	1,989
Stock Change	140	285	-50.9	135	232	71
Dist. 1-4	340	502	-32.3	176	82	211
Dist. 5	200	217	-7.8	41	150	140
Crude Runs to Stills	12,250	12,150	+0.8	12,431	11,730	11,199
Dist. 1-4	10,400	10,306	+0.9	10,456	9,872	9,457
Dist. 5	1,850	1,844	+0.3	1,975	1,858	1,742

that 1976 may well see a stable if not increasing U.S. crude-production rate.

Natural-gas liquids continued a decline pattern similar to crude oil. Natural-gas liquids is projected to equal 1,670,000 b/d in 1975. This decline is 25,000 b/d from 1974. Once again the production is still declining but at a slower rate than in the past. A decline rate of 1.5% as compared with a reduction of 2.5% between 1973 and 1974.

Including a processing gain of 495,000 b/d, up 4.2% from the expected level of 1974, total supply should come to 17,390,000 b/d in 1975. This would allow for a small stock buildup over the course of the year. Crude runs to stills are projected to increase by about a percentage point and average 12,250,000 b/d during 1975.

A look back. The U.S. petroleum industry closed out 1974 with some cause for optimism in a period checked with

pessimism. The disastrous shortages planned for by many turned into rather small losses viewed on an annual basis.

A quick rundown (for details see following tables) shows:

- Crude production declined 4.2% to average 8,800,000 b/d compared with 1973's average of 9,187,000 b/d. Two of the five districts were gainers. District 1 netted an increase of 10.1% or 11,000 b/d. District 4 showed a gain of 23,000 b/d, a 3.4% gain. Colorado, Montana, and Utah increased production with Wyoming holding about the same. The three biggest producers maintained their rank—Texas, Louisiana, and California.

- Marketed production of natural gas slid downward to average 61.1 billion cfd, a 1.5% decrease. Exports also declined to a level of 2.7 billion cfd.

- Refiners averaged running 12,150,000 b/d of crude compared with 12,431,000 b/d in 1974. Their plants operated at 82.1% of capacity as reported by the American Petroleum Institute.

- Crude imports into the U.S. set record levels during 1974. Total preliminary crude imports equal 3,500,000 b/d. Two of the traditionally large importers cut back their exports of crude to the U.S. substantially. Canada reduced crude exports to the U.S. by 136,000 b/d, a cut of about 14%. Calculated figures for Venezuela show a reduction of 43,000 b/d or 13%. The biggest increases in U.S. crude imports came from Nigeria and Iran. These countries showed gains of 207,000 b/d and 319,000 b/d respectively.

- Refined product imports declined during 1974. Gasoline nearly doubled in volume imported. The reductions occurred in the distillate and residual categories. Total product imports fell by 182,000 b/d, a reduction of about 6%.

- Rotary-rig activity was outstanding during 1974. The U.S. level of activity reached proportions not seen since 1963. California, Kansas, New Mexico, Oklahoma, Texas, and Wyoming all showed large gains in the average rotary-rig activity. Canadian rig activity declined during the year. The average rig activity fell by 25 rigs from the year previous. A decrease of 14% for the year.

- Refined product, natural-gas liquid, and crude stocks all increased during 1974. Gasoline stocks increased by 8,963,000 bbl or 4.2% during the

year. Residual inventories added 8,300,000 bbl and crude stocks increased 15.5% to a total of 267,100,000 bbl, up 24,622,000 bbl from ending inventory level of 1973.

• The results of the continuing U.S. inflation and the rise in world oil prices are clearly reflected in the wholesale price index which jumped by about 23 points during the year. The crude-oil and refined-products price indices increased by 41 points and 91 points, respectively.

Gain in drilling. Drillers completed an estimated 33,373 wells including 9,335 wildcats, during 1974, drilling 158,401,000 ft of hole. These are preliminary estimates which if proved correct represent a 20.9% gain in completions and a 25% increase in wildcats over 1973.

A Journal survey, meanwhile, indicates oil operators plan to drill an estimated 35,503 wells this year, including 10,483 wildcats, and 171,774,000 ft of hole. This would be a 6.4% gain for total wells, a 12.3% gain for wildcats, and an 8.4% gain in footage drilled, all above the very good 1974 achievement.

The 35,503-well estimate for 1975 drilling is believed approaching capacity of the domestic drilling industry. It will require extremely efficient use of existing equipment if the goal is achieved.

Over the next few years, availability of rigs is expected to be the limiting factor in how fast drilling can be expanded. The 1974 activity and the forecast work in 1975 both are above previous estimates of industry capability.

Active rotary rigs in 1974 averaged 1,471 with the highest number of rigs at work in any one week totaling 1,664. Some observers believe that the industry must average over 1,600 rigs at work this year to achieve the forecast goal.

Texas, as usual, was by far the leader in new drilling last year with 10,309 well completions including 3,435 wildcats. The surprise, however, was the strong showing in some other states. Kansas, for instance, was in second place with 3,066 completions and 986 wildcats, ahead of Oklahoma with 3,063 completions and 391 wildcats and Louisiana with 3,001 completions and 834 wildcats.

Other leading drilling states included California with 1,993 completions and 233 wildcats; New Mexico with 1,138

completions and 218 wildcats; Ohio with 1,785 completions and 148 wildcats; Pennsylvania with 1,327 completions and 105 wildcats; and Wyoming with 1,072 completions and 453 wildcats.

Drilling plans for 1975 indicate nearly all the leading states will see even increased activity. Texas, for example, expects a program of 10,952 wells, Louisiana 3,387, Kansas 3,117, California 2,199, New Mexico 1,237, Oklahoma 3,147, Wyoming 1,147, and Pennsylvania 1,281.

All in all, the drilling segment of the oil industry should experience a busy time in the months ahead. This doesn't mean all is rosy. Operators must worry about enough rigs, tubular goods, and drilling sites and whether Congress will knock out the props by repealing percentage depletion, changing the expensing of intangible costs, or impose more severe price controls on crude oil.

Role of imports. Despite Project Independence, the nation's dependency on petroleum from abroad has remained roughly unchanged from 1973's figure of about 40% of U.S. oil demand. But the so-called security of imports has declined slightly.

A special study of imports during June-October period last year made by Petroleum Industry Research Foundation Inc. (Pirinc) noted that imports from the Arab nations have increased 3.5% and now account for 8.2% of total U.S. oil demand. This compares with 7.7% a year earlier. Imports from non-Arab Eastern Hemisphere sources, particularly Iran and Nigeria, have increased much more and now account for one-third of total U.S. oil imports compared with one-fourth a year ago.

This dependency on Eastern Hemisphere oil actually is greater when imports of products are examined. Export refineries in Canada, the Caribbean, and Europe use a certain amount of Arab crude oil to make the products which they ship to America. Pirinc estimated that the total direct and indirect dependency on Arab oil is equal to nearly 11% of total U.S. oil demand.

These increases in dependency on Eastern Hemisphere oil have been made at the expense of so-called more secure Western Hemisphere petroleum. Imports of crude and products from Canada, Venezuela, and the Caribbean have all declined signifi-

cantly both in volume and as a percentage of total imports. Historically these imports have been considered politically and strategically more secure than those from the Eastern Hemisphere. This means that the reduction in U.S. oil demand and imports since the embargo has not made the nation less vulnerable to foreign oil interruptions than a year ago.

The Pirinc study also noted that imports of products are declining more than crude. All refined products during the study period showed declining imports from a year earlier with the principal decline occurring in residual, which dropped 18%.

Part of this decline was due to stepped-up production at U.S. refineries of residual fuel which may have increased by as much as 20%. An equally important reason was the declining fuel-oil demand by U.S. electric utilities due in part to a leveling off in power generation this year. Coal and nuclear's share in power generation increased at the expense of oil. As a result, residual-fuel-oil demand by utilities declined significantly.

Imports of gasoline and light fuel oil declined from all sources for two principal reasons: (1) foreign prices of these products have been higher than domestic prices in 1974, and (2) there now is sufficient domestic refining capacity to meet virtually all gasoline demand and a large share of distillate requirements. This is due to a combination of decreased demand and an increase in domestic refining capacity.

Pirinc concluded, however, that any significant volumetric decline in oil imports in 1975 is most unlikely to be achieved without forceful mandatory restrictions or large additional excise taxes.

The current comfortable supply position thus should not lead to complacency. Shell economists, for instance, warn in a special report that if energy-saving measures are abandoned in the face of apparent adequate supply, another crisis could easily be in the making. The report urges the adoption of national policies to cushion the effect of short-term fluctuations in supply including a mechanism for consuming countries to share shortages, greater reserve storage capacity, and better political relations with oil-producing countries. In the meantime, the nation must start moving on long-term solutions to energy supply and demand.

U.S. production of crude oil and lease condensate

	(Thousands of barrels daily)											Total 1859-1973
	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	
District I:												
Fla., N.Y., Pa., W.Va.	120	109	66	36	31	29	28	31	32	32	30	2,090,420
Total District I	120	109	66	36	31	29	28	31	32	32	30	2,090,420
District II:												
Illinois	77	82	96	107	120	139	154	162	169	175	192	3,011,833
Indiana	13	14	17	18	21	21	24	28	31	30	31	447,266
Kansas	173	181	202	215	232	243	258	272	284	287	290	4,629,330
Kentucky	23	24	26	29	32	35	38	43	49	53	54	623,633
Michigan	48	40	36	33	32	33	35	37	39	40	43	639,653
Nebraska	18	20	24	28	31	33	36	37	38	47	52	350,455
North Dakota	54	55	56	59	60	62	68	69	74	72	70	436,377
Ohio	25	24	22	23	27	30	30	27	30	35	43	800,932
Oklahoma	485	523	567	584	613	616	611	632	615	557	555	11,191,736
Other	2	2	2	2	1	2	3	1	1	1		9,348
Total District II	918	965	1,048	1,098	1,169	1,214	1,257	1,308	1,330	1,297	1,330	22,140,563
District III:												
Alabama	35	33	27	21	20	21	21	20	22	22	23	1,185,3
Arkansas	45	49	51	50	49	49	53	58	65	71	73	1,397,833
Louisiana	2,050	2,256	2,455	2,562	2,485	2,314	2,233	2,122	1,848	1,630	1,502	15,660,381
Gulf Coast	1,990	2,146	2,334	2,438	2,355	2,181	2,094	1,971	1,699	1,478	1,356	+
Rest of state	60	110	121	124	130	133	139	151	149	152	146	+
Mississippi	140	154	167	176	178	176	160	157	151	154	155	1,514,217
New Mexico	265	276	302	324	351	354	351	346	340	327	311	3,173,954
Texas	3,450	3,546	3,565	3,351	3,424	3,156	3,097	3,067	2,898	2,742	2,704	39,447,383
Gulf Coast	790	793	716	654	694	631	609	591	539	515	524	+
West Texas	1,795	1,829	1,769	1,646	1,634	1,497	1,453	1,427	1,352	1,262	1,212	+
East Texas field	190	207	211	186	199	153	145	142	124	111	119	+
Rest of state	675	717	869	865	897	869	890	907	883	854	849	+
Total District III	5,985	6,314	6,567	6,484	6,507	6,070	5,915	5,770	5,324	4,946	4,768	61,345,621
District IV:												
Colorado	102	100	90	75	68	78	87	93	92	92	95	1,067,231
Montana	95	94	93	95	104	120	132	66	97	90	84	864,166
Utah	108	87	71	65	64	64	64	65	66	69	78	494,284
Wyoming	395	396	386	405	439	424	394	373	368	379	379	3,939,117
Total District IV	700	677	640	640	675	686	677	628	623	630	636	6,364,798
District V:												
Alaska	195	199	202	218	229	202	181	80	39	31	30	626,197
Arizona	2	2	3	3	5	7	9	8				15,922
California	880	921	951	982	1,020	1,028	1,026	984	945	867	820	16,784,056
Coastal region	208	216	212	237	222	180	176	191	190	182	178	+
Los Angeles region	345	363	389	392	430	465	453	380	340	296	279	+
San Joaquin Valley	327	342	350	353	368	383	397	413	416	389	363	+
Nevada					1	1	1	1	1	1		2,949
Total District V	1,077	1,122	1,156	1,203	1,254	1,238	1,217	1,073	986	899	850	17,429,124
U.S. Total	8,800	9,187	9,477	9,451	9,636	9,237	9,094	8,810	8,295	7,804	7,614	109,370,526

*Preliminary †Thousands of barrels. ‡Not available.

Supply and demand of crude in the U.S.

	(Thousands of barrels daily)												
	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962
SUPPLY:													
Crude imports	3,500	3,244	2,222	1,681	1,324	1,409	1,290	1,128	1,225	1,238	1,199	1,131	1,126
Crude production	8,800	9,187	9,477	9,463	9,637	9,238	9,095	8,810	8,295	7,804	7,614	7,542	7,332
Total new supply	12,300	12,431	11,699	11,144	10,961	10,647	10,385	9,938	9,520	9,042	8,813	8,673	8,458
DEMAND:													
Crude refinery runs	12,150	12,432	11,731	11,199	10,870	10,629	10,312	9,815	9,444	9,043	8,807	8,687	8,410
Crude transfers	17	19	12	17	14	14	14	12	12	13	12	11	14
Crude exports	3	2	1	1	14	4	5	73	4	3	4	5	5
Crude loss	12	13	13	12	11	11	11	9	10	10	10	10	9
Total crude demand	12,182	12,466	11,757	11,299	10,909	10,658	10,342	9,909	9,470	9,069	8,833	8,713	8,438
Stock change	+118	-35	-58	-46	+31	-11	+43	+29	+50	-27	-20	-40	+20

*Preliminary.

Rotary-rig activity by states.

	Peak No.	Low No.	Average rig activity									
			1974	1973	1972	1971	1970	1969	1968	1967	1966	1965
Alabama	18	7	12	13	15	8	7	6	3	2	2	1
Alaska	14	3	9	5	5	5	14	28	20	21	13	6
Inland	9	2	6	4	4	5	12	18	3	5	5	3
Offshore	5	0	3	1	1	0	2	10	17	16	8	3
Arkansas	21	13	18	15	15	15	13	16	7	8	10	11
Arizona	2	1	1	2	1	1	0	2	1	3	1	1
California	85	53	72	51	46	46	52	78	87	83	79	89
Inland	82	51	70	49	45	40	42	61	65	67	70	83
Offshore	4	1	2	2	1	6	10	17	22	16	9	6
Colorado	60	33	46	42	35	30	25	23	17	16	16	19
Florida	12	6	7	9	19	11	4	1	1	2	2	4
Georgia	3	0	0	1	0	0	0	0	0	0	0	0
Idaho	1	0	0	1	0	0	0	0	0	0	0	0
Illinois	12	1	7	6	14	13	14	17	22	30	30	24
Indiana	3	0	1	0	1	1	1	1	2	3	5	5
Iowa	1	0	0	1	0	1	0	0	0	0	1	0
Kansas	55	35	44	28	24	29	30	38	35	41	55	70
Kentucky	4	0	2	1	2	2	1	2	5	9	13	12
Louisiana	224	186	203	205	214	194	204	230	233	235	256	270
North	34	23	29	23	19	16	12	19	19	20	23	30
Inland waters	68	49	58	55	54	50	57	57	64	66	72	72
South	65	39	49	56	59	54	56	69	59	58	63	73
Offshore	77	57	67	71	82	74	79	85	91	91	98	95
Maryland	0	0	0	0	1	0	0	1	1	0	4	2
Michigan	32	12	24	20	17	12	11	10	10	10	9	11
Mississippi	33	23	29	29	17	39	43	40	36	33	34	35
Missouri	2	0	0	1	0	0	0	0	0	0	1	0
Montana	37	10	24	19	20	17	17	31	34	22	24	26
Nebraska	11	3	7	5	6	5	6	10	5	5	8	10
Nevada	3	0	1	0	0	1	0	0	2	1	1	2
New Mexico	94	67	79	62	55	47	40	64	68	56	60	65
New York	10	2	7	1	0	1	0	0	1	1	1	1
North Carolina	1	0	0	0	0	0	0	0	0	0	0	0
North Dakota	19	5	12	10	7	9	9	12	13	11	12	12
Ohio	44	18	30	36	22	17	24	22	22	18	14	22
Oklahoma	173	121	146	115	90	90	98	120	106	101	141	163
Oregon	0	0	0	0	0	0	0	0	0	0	1	1
Pennsylvania	19	9	14	11	8	9	9	7	5	7	10	9
South Dakota	2	0	1	1	1	1	2	1	1	0	0	2
Tennessee	2	0	0	0	0	1	2	1	0	1	1	0
Texas	612	423	508	376	322	291	302	322	329	340	387	425
Gulf Coast	161	97	128	109	91	79	73	77	88	90	103	112
Offshore	29	17	21	9	6	5	6	10	6	7	8	5
North	90	45	67	22	16	15	17	25	25	28	31	34
Panhandle	44	24	35	23	22	16	19	19	20	21	23	25
East	68	24	45	30	26	23	25	37	34	36	38	40
West Central	81	55	62	82	71	76	77	74	67	67	82	102
West	172	135	150	101	90	77	85	80	89	91	102	107
Utah	50	33	42	38	34	17	12	12	12	15	14	14
Virginia	3	0	2	1	0	1	1	0	0	0	0	1
Washington	0	0	0	0	0	0	0	0	0	1	1	0
West Virginia	30	1	16	20	16	17	16	18	16	15	19	24
Wyoming	140	87	107	70	60	45	71	81	56	44	48	50
Total U.S.	1,664	1,350	1,471	1,194	1,087	976	1,028	1,194	1,150	1,134	1,273	1,387
Canada West	268	57	151	175	148	120	131	149	150	144	156	163
Canada East	6	1	3	4	4	4	3	2	1	1	1	2

Grand Total 1,820 1,419 1,625 1,373 1,239 1,100 1,162 1,345 1,301 1,279 1,430 1,552
 Source: Hughes Tool Co. Note: Peak and low figures may not add to totals.

Drillers sank more wells than

Well forecast for 1975

State	1974 estimate			1975 forecast			Total footage 1975 (1,000 ft)	Change from 1974 Total wells
	Total wells 1974	Total wildcats 1974	Total footage (1,000 ft)	Total wells 1975	Wildcat wells 1975	Field wells 1975		
Alabama	95	54	880	124	68	56	1,119	+ 29
Alaska	32	10	224	119	47	72	834	+ 87
Arizona	11	5	73	8	8	0	53	- 3
Arkansas	300	85	1,596	306	87	219	1,613	+ 6
California	1,993	233	5,115	2,199	288	1,911	5,650	+ 206
Onshore	1,923	227	4,911	2,117	281	1,836	5,428	+ 194
Offshore	70	6	204	82	7	75	222	+ 12
Colorado	823	344	4,982	901	389	512	5,425	+ 78
Florida	48	36	583	96	75	21	1,181	+ 48
Georgia	5	5	30	0	0	0	0	- 5
Idaho	2	2	9	0	0	0	0	- 2
Illinois	740	204	1,826	773	211	562	1,932	+ 33
Indiana	403	176	634	407	191	216	641	+ 4
Iowa	2	2	3	0	0	0	0	- 2
Kansas	3,066	986	8,953	3,117	1,017	2,100	9,102	+ 51
Kentucky	734	201	1,164	766	206	560	1,215	+ 32
Louisiana	3,001	834	22,453	3,387	1,095	2,292	25,560	+ 386
North	1,217	235	4,514	1,326	241	1,085	4,918	+ 109
South	1,091	402	11,357	1,168	467	701	12,159	+ 77
Offshore	693	197	6,582	893	387	506	8,483	+ 200
Maryland	2	2	13	0	0	0	0	- 2
Michigan	390	235	1,932	526	315	211	2,605	+ 136
Mississippi	463	291	3,802	534	341	193	4,386	+ 71
Missouri	55	22	69	24	16	8	30	- 31
Montana	648	368	2,026	691	375	316	2,218	+ 43
Nebraska	228	161	1,175	262	234	28	1,352	+ 34
Nevada	2	2	18	4	4	0	36	+ 2
New Mexico	1,138	218	6,228	1,237	248	989	6,831	+ 99
East	771	181	4,860	862	176	686	5,433	+ 91
West	367	37	1,368	375	72	303	1,398	+ 8
New York	311	0	440	327	14	313	463	+ 16
North Carolina	10	10	38	0	0	0	0	- 10
North Dakota	134	73	1,043	198	136	62	1,542	+ 64
Ohio	1,785	148	7,418	1,765	152	1,613	7,335	- 20
Oklahoma	3,063	391	16,837	3,147	447	2,700	17,299	+ 84
Pennsylvania	1,327	105	2,826	1,281	117	1,164	2,728	- 46
South Dakota	10	10	61	17	12	5	102	+ 7
Tennessee	110	75	176	112	77	35	178	+ 2
Texas	10,309	3,435	54,175	10,952	3,667	7,285	58,007	+ 643
District 1	616	242	2,308	593	201	392	2,228	- 23
District 2	741	450	4,375	866	499	367	5,113	+ 125
District 3	956	467	6,110	876	411	465	5,782	- 80
District 4	989	560	6,409	1,024	572	452	6,635	+ 35
District 5	141	80	773	147	86	61	785	+ 6
District 6	315	123	2,146	386	142	244	2,598	+ 71
District 7-B	1,313	465	4,287	1,390	482	908	4,565	+ 77
District 7-C	1,096	206	6,263	1,174	220	954	6,435	+ 78
District 8	1,439	167	8,747	1,498	212	1,286	9,108	+ 59
District 8-A	938	144	4,951	1,140	247	893	5,880	+ 202
District 9	1,103	289	3,327	1,023	296	727	3,119	- 80
District 10	502	98	3,174	520	112	408	3,167	+ 18
Offshore	160	144	1,305	315	187	128	2,592	+ 155
Utah	187	55	1,532	212	61	151	1,796	+ 25
Virginia	52	2	249	48	6	42	229	- 4
West Virginia	822	102	2,400	816	97	719	2,375	- 6
Wyoming	1,072	453	7,418	1,147	487	660	7,937	+ 75
Total U.S.	33,373	9,335	158,401	35,503	10,488	25,015	171,774	+ 2,130
Canada	4,552	1,270	15,630	3,881	727	3,154	12,996	- 671
West	4,290	1,247	15,065	3,616	725	2,893	12,594	- 672
Alberta	3,735	1,018	12,852	3,211	576	2,635	11,049	- 524
B.C.	163	74	865	129	28	101	685	- 34
Manitoba	47	16	154	45	20	25	147	- 2
North-Arctic	56	54	470	22	22	0	185	- 34
Saskatchewan	289	85	724	211	79	132	528	- 78
East	262	23	565	263	2	261	402	+ 1
Offshore	23	23	213	2	2	0	18	- 21
Ontario	239		352	261	0	261	384	+ 22

considered in early-year planning

PRELIMINARY estimates of 1974 total well completions in the U.S. show that the industry drilled more wells than it has previously planned earlier in the year.

Total well completions for the year 1974 are estimated at 33,373, compared to the 32,616 earlier reported. The year's total wells included 9,335 wildcat completions. Total footage drilled in 1974 is estimated at 158,401,000 ft. The complete listing of 1974 well completions in all categories will be published by the API and printed in The Journal later in the quarter.

The outlook is very good for 1975. The industry looks for 35,503 wells to be drilled. This is an increase of 6.4% over 1974. Total wildcat completions for 1975 will near 10,488, up 12.4% over 1974. Total footage drilled in 1975 should reach 171,774,000 ft, up 8.2% over last year. The 1975 well count will include 25,015 field-development wells.

A comprehensive Journal survey of operators throughout the oil kingdom covered nearly 9,500 wells for 1974. The top 20 companies in the nation plan to drill 7,488 wells this year compared to 6,823 in 1974. The accompanying table notes the data for past years. Notice that 1975 will be the biggest year listed on this table.

Nearly every state shows an increase in total drilling. Only Arizona, Georgia, Idaho, Iowa, Maryland, Ohio, Virginia, and West Virginia expect fewer well completions. Largest well increases are in California, up 206, Louisiana, up 386, and Texas, up 643.

The bright drilling picture in the U.S. for 1974 was bolstered by the high number of rotary rigs working in various areas. This rig count will increase the 1975 count also. Not since the 1950's has the Anadarko basin of western Oklahoma and the Texas Panhandle seen such a flurry of drilling action. Most of the wells are looking for and are finding new gas reserves. Some of this success is in and around older producing areas, while other good news is being made in wildcat operations in newer areas.

The impact of the price increase for gas and oil is very evident throughout Oklahoma well drilling slated to increase by 84 wells.

The top 20 company scores

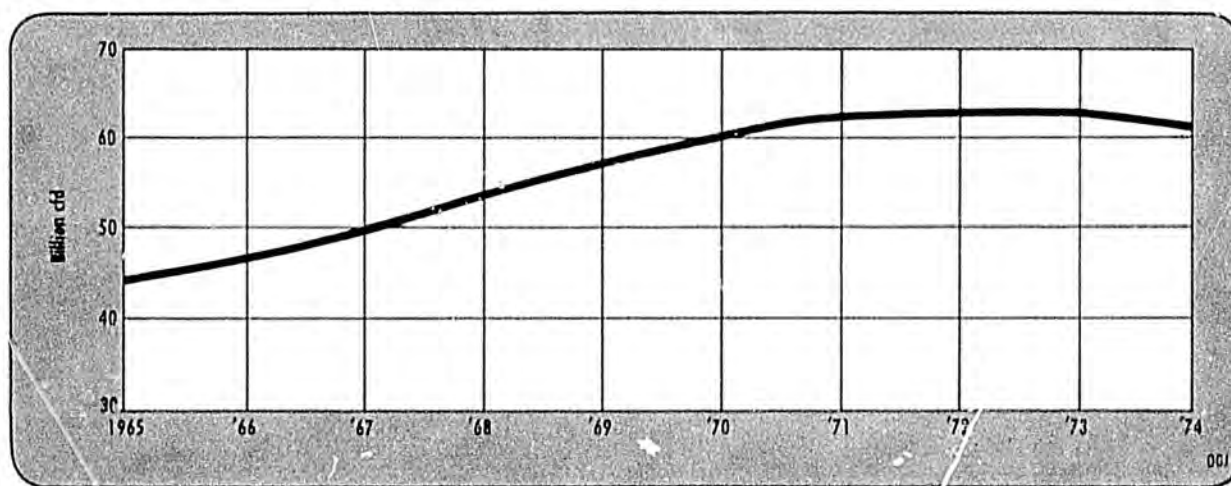
State	1975 Fore- cast	Total wells				Wildcats	
		1974	1973	1972	1971	1974	Fore- cast 1975
Alabama	26	13	21	36	23	6	11
Alaska	92	21	21	15	31	6	32
Arizona	0	1	0	10	2	1	0
Arkansas	18	24	15	20	30	9	5
California	1,112	1,053	567	839	1,431	53	59
Onshore	1,070	1,011	562	827	1,388	53	53
Offshore	42	42	5	12	43	0	6
Colorado	314	312	54	228	225	33	43
Florida	13	6	36	64	32	6	13
Georgia	0	2	2	0	0	2	0
Idaho	0	2	4	0	0	2	0
Illinois	41	68	88	39	84	12	7
Indiana	16	28	1	1	1	0	0
Kansas	209	212	60	322	50	14	23
Kentucky	1	4	3	20	3	0	0
Louisiana	1,332	1,021	862	1,156	1,044	222	241
North	274	159	66	82	166	22	18
South	477	467	471	491	507	46	53
Offshore	581	395	305	583	371	154	170
Maryland	0	0	0	0	0	0	0
Michigan	305	207	117	135	51	134	186
Mississippi	49	37	39	75	128	16	26
Missouri	0	1	8	0	0	1	0
Montana	62	41	34	50	40	12	30
Nebraska	8	3	3	6	7	0	0
Nevada	4	2	0	1	2	1	4
New Mexico	307	304	154	223	171	32	42
East	231	205	139	164	132	28	27
West	76	99	15	59	39	4	15
New York	14	50	4	9	2	0	0
North Carolina	0	3	0	0	2	3	0
North Dakota	22	30	11	13	19	4	6
Ohio	2	2	5	8	5	0	0
Oklahoma	375	470	223	291	326	36	74
Oregon	0	0	1	0	0	0	0
Pennsylvania	114	224	41	14	11	15	20
South Dakota	6	2	1	1	0	2	3
Tennessee	2	1	0	0	0	1	2
Texas	2,506	2,146	1,547	2,138	1,686	216	321
District 1	201	147	104	113	24	10	10
District 2	64	57	66	54	52	11	14
District 3	175	119	175	262	263	8	27
District 4	139	155	250	264	295	8	20
District 5	18	18	6	6	9	9	8
District 6	60	34	33	43	51	3	9
District 7-B	27	14	32	22	23	1	5
District 7-C	193	229	93	52	52	20	20
District 8	666	661	389	635	526	35	58
District 8-A	597	317	230	361	294	6	25
District 9	60	186	35	238	32	3	6
District 10	108	114	110	54	40	12	17
Offshore	198	95	24	34	25	90	102
Utah	138	149	100	10	41	23	14
Virginia	2	1	0	0	0	1	2
Washington	0	0	0	3	0	0	0
West Virginia	54	83	22	35	28	12	12
Wyoming	344	300	112	330	223	36	71
Total U.S.	7,488	6,823	4,156	6,203	5,696	911	1,247

Marketed production of natural gas

	(Million cubic feet per day)									
	1974*	Actual 1973	1972	1971	1970	1969	1968	1967	1966	1965
Alaska	390	359	344	333	306	139	47	40	29	20
Arkansas	340	432	456	473	497	464	428	319	296	227
California	1,200	1,231	1,335	1,678	1,778	1,857	1,953	1,866	1,965	1,809
Colorado	370	377	320	297	290	325	332	320	326	346
Kansas	2,420	2,447	2,436	2,425	2,466	2,420	2,283	2,389	2,322	2,174
Louisiana	21,750	22,582	21,843	22,142	21,338	19,802	17,530	15,664	13,967	12,238
Michigan	110	122	94	70	106	99	111	92	105	95
Mississippi	225	273	285	325	345	360	369	382	381	457
Montana	150	154	92	90	117	113	53	71	99	77
Nebraska	10	17	10	10	16	19	22	23	27	29
New Mexico	3,425	3,339	3,332	3,199	3,121	3,118	3,181	2,925	2,770	2,568
Oklahoma	4,850	4,852	4,950	4,614	4,370	4,175	3,800	3,871	3,318	3,619
Texas	23,525	23,326	23,720	23,427	22,898	21,516	20,479	19,697	19,165	18,181
Utah	135	117	108	116	117	128	126	134	144	196
W. Virginia	570	572	589	641	664	635	647	579	585	568
Others	1,650	1,854	1,817	1,785	1,628	1,538	1,431	1,412	1,396	1,340
TOTAL	61,120	62,048	61,731	61,625	60,057	56,708	52,792	49,784	46,895	43,944
Volume Change	<928>	317	106	1,568	3,349	3,916	3,008	2,889	2,951	1,467
Percent Change	<1.5>	0.5	0.2	2.6	5.9	7.4	6.0	6.2	6.7	3.5
Imports	2,650	2,830	2,793	2,562	2,249	1,986	1,781	1,545	1,285	1,252
Exports	250	211	214	219	191	140	256	225	155	65

*Preliminary.

Marketed gas output stays level



U.S. employment, earnings, and price indices

	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
U.S. Employment (000's)										
All manufacturing	19,835	19,820	18,933	18,529	19,349	20,167	19,781	19,447	19,214	18,062
Petroleum refining	150	147	151	152	154	145	150	148	148	148
Petroleum and natural gas production	279	264	262	262	270	280	276	276	282	287
Average Hourly Earnings										
All manufacturing	\$4.28	\$4.07	\$3.81	\$3.56	\$3.36	\$3.19	\$3.01	\$2.83	\$2.72	\$2.61
Petroleum refining	5.92	5.54	5.25	4.82	4.49	4.23	3.94	3.77	3.60	3.47
Petroleum and natural gas production	4.98	4.47	3.97	3.75	3.57	3.43	3.22	3.03	2.87	2.74
Price Indices (1967 = 100)										
Wholesale price index	157.7	134.7	119.1	113.9	110.4	106.5	102.5	100.0	99.8	96.6
Crude oil price index	174.4	133.2	116.1	111.1	108.9	105.8	100.7	100.0	98.6	97.9
Refined products price index	220.3	128.7	108.9	106.8	101.1	99.6	98.1	100.0	97.4	93.8

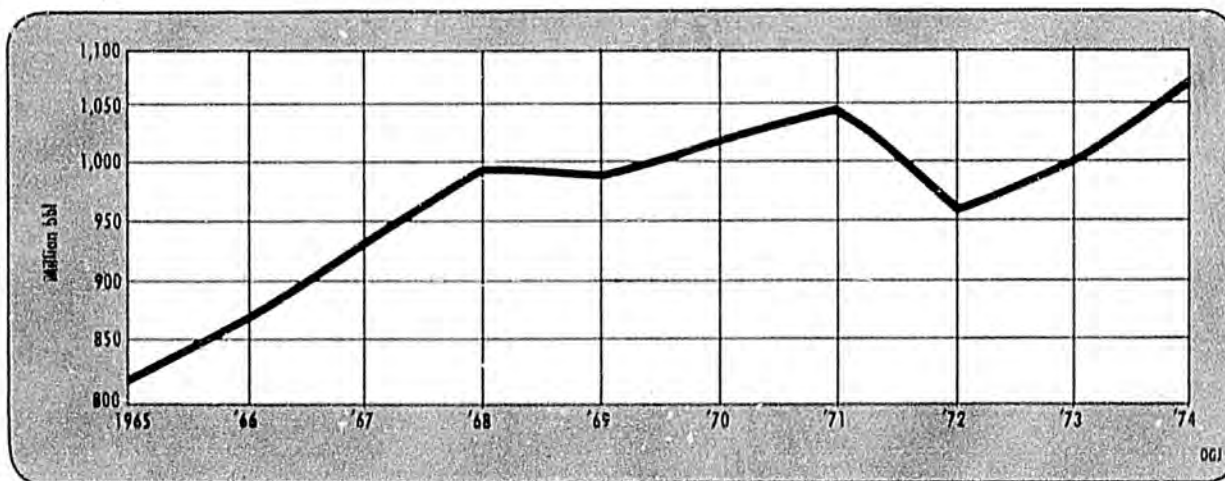
*Preliminary

Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings. U.S. Department of Commerce, U.S. Bureau of Mines.

Refinery runs by districts

	(Thousands of barrels daily)												
	% of capacity	1974*	% of total	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964
East Coast	80.7	1,246	10.7	1,327	1,161	1,181	1,147	1,252	1,176	1,145	1,143	1,089	1,106
Appalachian: Dist. 1	76.9	166	1.4	174	161	150	143	57	127	122	116	111	106
Total Dist. 1	80.2	1,412	12.1	1,501	1,322	1,331	1,290	1,309	1,303	1,267	1,259	1,200	1,212
Appalachian: Dist. 2	90.6	58	0.4	55	54	55	60	63	59	60	78	101	101
Ill., Ind., Ky.	83.6	2,152	18.2	2,267	2,134	2,054	1,995	1,868	1,830	1,778	1,731	1,632	1,579
Minn., Wis., Oak.	73.2	218	2.0	242	228	217	200	198	185	164	162	153	147
Okla., Kan., Mo.	88.8	920	7.4	921	904	904	899	884	885	847	818	759	744
Total Dist. 2	84.3	3,340	28.0	3,485	3,320	3,230	3,154	3,013	2,959	2,849	2,789	2,645	2,571
Texas:													
Inland	81.5	418	3.4	427	416	401	395	388	371	350	340	321	316
Gulf Coast	83.5	2,867	22.4	2,782	2,635	2,523	2,450	2,407	2,359	2,283	2,185	2,116	2,088
Louisiana Gulf	85.9	1,633	13.4	1,664	1,604	1,377	1,317	1,285	1,214	1,101	979	911	853
N. La.-Ark.	72.3	154	1.1	135	132	148	154	145	142	135	128	126	123
New Mexico	56.3	59	0.4	46	45	42	41	39	37	34	34	32	30
Total Dist. 3	53.4	5,131	40.7	5,054	4,832	4,491	4,357	4,264	4,123	3,903	3,666	3,506	3,410
Total Dist. 4	76.4	415	3.3	415	398	405	393	385	366	344	338	330	319
Total Dist. 5	77.8	1,844	15.9	1,976	1,858	1,742	1,676	1,658	1,567	1,452	1,392	1,362	1,295
Total U.S.	82.1	12,150	100.0	12,431	11,730	11,199	10,870	10,629	10,318	9,815	9,444	9,043	8,807

Total stocks head upward



Refined product, natural-gas-liquid, and crude stocks

(Thousands of barrels)										
Refined product stocks	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
Gasoline	222,380	213,417	217,149	223,771	214,348	217,392	211,526	207,715	194,177	183,058
Motor	218,600	209,478	212,894	219,352	209,255	211,199	204,496	199,790	186,393	174,717
Aviation	3,780	3,939	4,255	4,419	5,093	6,193	7,030	7,925	7,784	8,341
Special naphtha	4,800	4,521	5,232	5,384	6,193	6,292	5,829	5,742	5,583	6,209
Kerosine	14,500	21,022	19,111	24,438	27,848	26,780	23,480	25,008	24,004	24,080
Distillate	202,400	196,461	154,319	190,622	195,271	171,714	173,158	159,674	154,096	155,407
Residual	61,780	53,480	55,216	59,681	53,994	58,395	65,359	65,597	61,196	56,214
Kerosine jet fuel	24,400	22,945	19,346	20,747	20,989	19,517	15,373	13,174	12,139	10,361
Naphtha jet fuel	5,660	5,599	6,147	6,990	6,621	8,556	8,904	9,023	7,235	8,388
LRG	7,900	7,719	7,781	7,361	5,645	5,050	4,373	14,925	14,336	13,665
Unfinished oils	109,960	99,154	94,761	100,574	98,989	97,819	93,399	90,201	89,535	88,609
Other refined prod.	51,220	52,298	49,279	51,203	43,152	43,125	46,725	48,340	43,350	44,197
Total product stocks	705,000	676,616	628,341	690,771	673,059	654,640	648,126	629,339	595,651	580,188
Nat.-gas-liquids stk.	98,000	94,106	79,238	93,528	68,435	60,256	77,253	62,969	40,423	35,867
Crude stocks	267,100	242,478	246,395	259,648	276,367	265,227	272,193	248,970	238,391	220,289
Total stocks	1,070,100	1,013,200	953,974	1,043,947	1,017,861	980,123	997,572	941,338	874,465	836,344

*Preliminary. Includes LRG for chemical use previously reported in petrochemical feedstocks.

Crude imports by origin

	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
	(Thousands of barrels daily)									
Bolivia	8	2	...	2	2	15.3	18.8	19.2	3.4	...
Chile	...	...	...	1	...	4.7	...	...	...	...
Colombia	...	2	5	9	20	42.6	32.7	32.5	39.5	41.7
Ecuador	60	47	...	...	...	...	...	...	...	...
Mexico	1	1	...	...	...	1.0	...	...	...	6.9
Trinidad	65	60	24	...	...	...	5.4	3.5	...	...
Venezuela	302	345	256	303	268	306.1	343.5	359.1	403.9	432.5
Latin America total	436	457	285	315	290	369.7	400.4	414.3	446.8	481.1
Algeria	203	120	87	13	6	1.0	5.3	4.0	3.8	8.9
Angola	50	48	16	4	...	...	...	...	...	...
Congo	4	...	...	...	...	...	...	...	...	...
Egypt	10	15	8	19	21	40.5	29.5	3.6	2.3	2.4
Gabon	30	...	...	...	...	...	...	...	...	...
Libya	5	133	110	53	47	133.9	113.6	41.9	69.0	41.6
Nigeria	655	448	244	95	48	49.2	8.6	3.9	11.3	14.5
Tunisia	5	18	7	...	...	...	...	...	...	...
Africa total	962	782	472	184	122	224.6	157.0	53.4	86.4	67.4
Kuwait	2	42	36	29	33	34.4	43.3	18.8	26.1	55.4
Saudi Arabia	338	462	174	115	17	34.7	51.8	81.3	125.4	132.2
Neutral Zone	...	...	...	...	23	43.5	29.4	11.0	19.3	26.7
Iran	535	216	136	106	33	41.9	57.8	65.2	84.5	78.5
Iraq	...	4	4	11	...	...	...	4.7	25.9	15.6
Qatar	7	7	3	...	...	0.5	...	...	0.5	11.9
Israel	...	1	...	...	...	...	...	...	...	...
United Arab Emirates	80	71	74	80	63	13.8	15.3	5.3	13.1	13.8
Middle East total	962	803	427	341	169	168.8	197.6	186.3	294.8	334.1
Canada	865	1,001	856	721	672	557.0	462.9	412.1	347.1	295.2
Far East	275	201	167	117	70	88.4	72.6	61.7	49.9	60.7
Total crude	3,500	3,244	2,207	1,678	1,323	1,408.5	1,290.5	1,127.8	1,225.0	1,238.5

*Preliminary

Imports of refined products

	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
	(Thousands of barrels daily)									
Gasoline	195	132	68	59	67	62.2	59.0	42.7	48.1	37.1
Kerosine	3	2	1	1	4	2.6	0.5	0.1	0.6	0.3
Jet-fuel kerosine	160	167	162	150	125	110.7	85.8	73.8	51.4	36.9
Jet-fuel naphtha	30	36	33	30	19	14.1	19.4	14.9	34.4	45.2
Distillate	255	380	182	153	147	139.4	131.5	50.7	37.9	35.7
Residual	1,676	1,827	1,746	1,583	1,528	1,264.7	1,120.0	1,084.3	1,032.3	944.1
Unfinished oils	140	137	125	124	108	106.2	80.2	96.2	96.5	92.3
Other	1316	1276	1215	1145	97	57.5	52.9	45.9	46.9	37.7
Total U.S.	2,775	2,957	2,532	2,245	2,095	1,757.4	1,549.3	1,408.6	1,348.1	1,229.3

*Preliminary. †Includes plant condensate 1974, 103; 1973, 103; 1972, 86; 1971, 36.

Exports of refined products—and crude

	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
	(Thousands of barrels daily)									
Gasoline	4	5	2.6	4.5	3.8	6.7	5.7	18.8	15.9	17.6
Distillate	3	9	3.3	7.6	2.5	3.1	4.2	11.7	12.0	10.0
Residual	12	25	33.0	36.2	54.2	46.3	54.7	60.1	35.3	40.8
Lubricants	35	35	41.1	43.4	44.1	44.9	49.2	51.2	46.9	45.7
Coke	115	96	85.1	74.0	83.7	63.1	53.3	44.6	39.6	32.4
Asphalt	1	1	0.9	0.8	1.0	1.3	1.2	1.3	1.3	1.1
LP-gas	25	27	31.4	25.7	27.3	35.1	29.0	25.4	22.4	20.6
Other refined products	27	31	24.8	30.6	28.6	28.2	28.8	21.3	21.0	14.7
Crude	3	2	0.5	1.4	13.6	3.9	4.9	72.7	4.0	3.0
Total U.S.	225	231	222.7	224.2	258.8	232.6	231.0	307.1	198.4	185.9

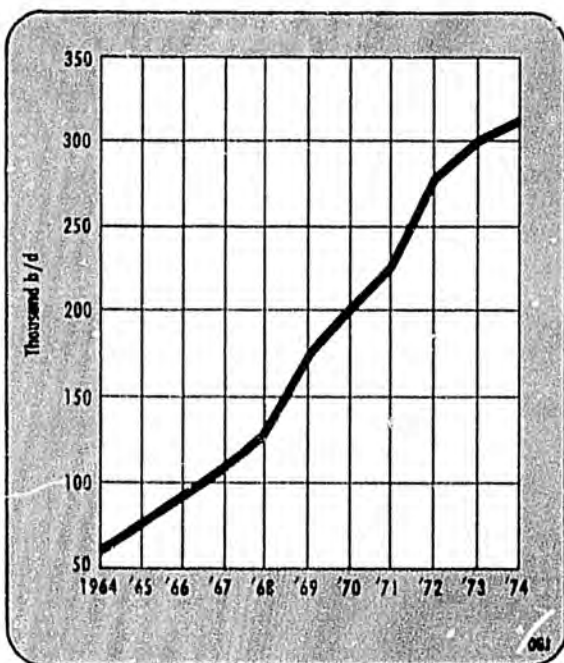
*Preliminary

Production of natural-gas liquids, liquefied refinery gases

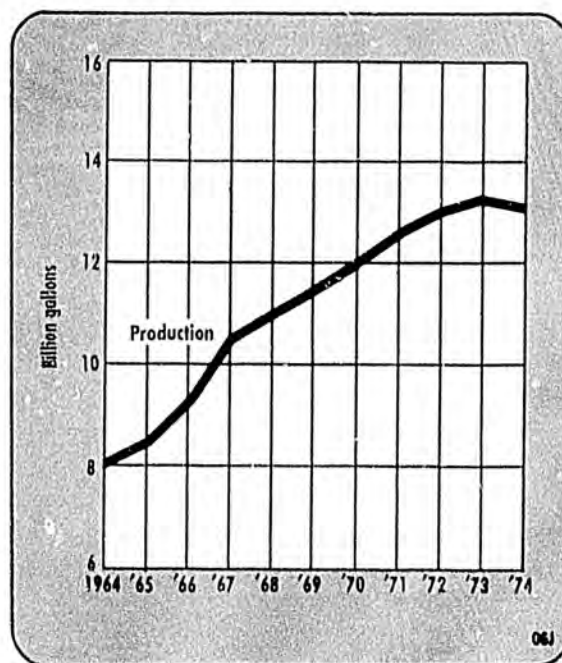
	1974*	1973	1972	1971	1970	1969	1968	1967	1966	1965
(Thousands of barrels daily)										
Ethane (from gas processing)	315	296	276	221	201	173	125	101	82	73
LP-gases:										
Propane	570	583	587	581	555	535	504	465	409	372
Butane	240	243	242	243	239	237	216	207	192	170
Butane-propane mix	10	10	10	11	16	16	34	42	36	24
Isobutane	90	92	92	88	84	74	81	80	73	67
Total LP-gases	910	928	931	923	894	862	835	794	710	633
Natural gasolines†	400	443	427	453	452	423	404	382	356	356
Finished product and others‡	60	70	81	96	113	117	140	132	136	119
Total natural-gas liquids	1,685	1,737	1,715	1,693	1,660	1,575	1,504	1,409	1,284	1,181
Liquefied refinery gas¶	348	350	332	331	319	313	323	306	291	293
Ethane (from refineries)	25	25	25	25	26	25	25	25	25	25
Total all products	2,058	2,112	2,072	2,049	2,005	1,913	1,827	1,715	1,575	1,474

†Includes isopentane. ‡Includes plant condensate. ¶LRG figures, 1968 and earlier, include ethane. *Preliminary.

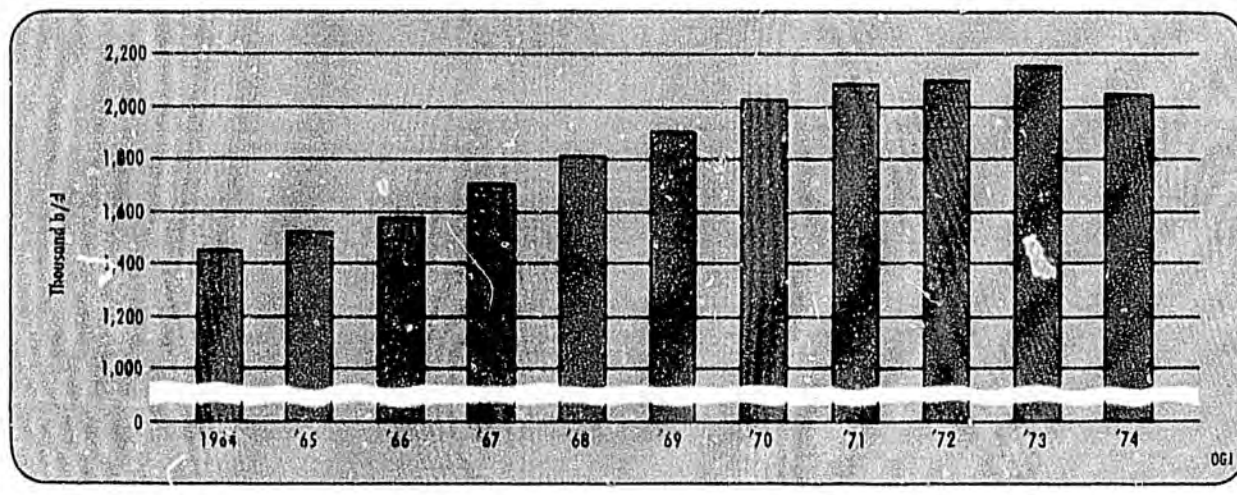
Ethane production rising



Total propane



Total production of NGL and LRG





WITH U.S. oil reserves on the rapid decline and demand on the rise, American geologists are in the field in ever increasing numbers. Many areas of the

Here are the big U.S. reserves

MOST of the crude-oil production in the U.S. comes from the nation's giant oil fields. These fields lie in many states with Texas having the most. California and Louisiana are also great storehouses of oil.

Alaska's Prudhoe Bay field, not yet on stream, is one of the largest with

reserves at from 10 to 20 billion bbl or more.

Newest field to pass the 1 billion-bbl production mark in the country is Oklahoma's Sho-Vel-Tum.

To be included on this select list of U.S. oil fields, a pool must have an ultimate reserve of 100,000,000 bbl or

more. Many of the fields on the listing are of 1920-30 vintage, the golden years of U.S. oil production. Some of these fields are still producing respectable amounts of oil each year.

Figures are in thousands of barrels. Only crude oil is figured into this reserve tabulation.

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
ALABAMA					
	Citronelle	4,866	112,122	37,877	416
ALASKA					
	Granite Point	4,233	56,131	34,321	25
	McArthur River	39,191	253,387	136,748	52
	Middle Ground Shoal	9,033	87,695	97,000	33
	Prudhoe Bay	2,181	6,674	*	3
	Swanson River	9,741	154,297	51,197	42
*Reserves estimates range from 10 to 20 billion bbl.					
APPALACHIAN					
	Allegheny	400	166,400	1,415	2,100
	Bradford	2,600	658,695	19,774	17,300
ARKANSAS					
	Magnolia	446	152,870	7,130	56
	Schuler and East	613	105,736	4,264	108
	Smackover	2,860	508,507	21,493	2,611
CALIFORNIA					
SAN JOAQUIN VALLEY					
	Belridge South	8,544	194,803	77,900	2,667
	Buena Vista	4,003	617,240	32,427	1,137
	Coalinga	6,483	632,952	65,887	2,219
	Coalinga Nose	3,504	432,473	30,959	74
	Coles Levee North	1,218	140,848	12,766	116
	Cuyama South	1,471	208,617	11,002	135
	Cymric	2,919	131,500	24,405	746
	Edison	1,206	113,339	12,500	527
	Elk Hills	789	283,788	1,031,000	93

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
	Fruitvale	1,016	101,817	11,400	349
	Greeley	677	107,973	3,100	47
	Kern Front	3,235	134,691	30,300	952
	Kern River	26,765	635,757	850,000	4,531
	Kettleman North Dome	643	452,104	3,756	129
	Lost Hills	2,165	119,092	21,700	1,149
	McKittrick	6,538	206,314	43,022	952
	Midway Sunset	4,920	1,197,423	420,191	6,027
	Mount Poso	2,527	168,357	20,620	498
	Rio Bravo	170	113,139	1,731	48
COASTAL AREA					
	Cat Canyon East and West	6,064	174,126	48,100	590
	Dos Cuadras	14,990	102,488	73,247	123
	Elwood	40	103,266	479	12
	Orcutt	1,776	148,789	13,035	176
	Rincon	3,319	123,549	20,209	312
	San Ardo	12,877	274,160	103,800	913
	Santa Ynez*				
	Santa Maria Valley	3,558	159,363	26,612	214
	South Mountain	1,640	130,617	16,142	441
	Ventura	11,393	793,393	83,500	809
*1-3 billion bbl					
LOS ANGELES BASIN					
	Beverly Hills	4,656	78,334	31,384	128
	Brea Olinda	3,388	343,585	24,212	721
	Coyote East	674	98,135	5,300	67
	Coyote West	2,143	232,141	18,361	161
	Dominguez	1,110	258,272	10,162	131
	Huntington Beach	19,035	923,820	118,800	1,118
	Inglewood	3,588	296,656	25,100	432
	Long Beach	2,598	878,213	20,605	733
	Montebello	558	184,500	5,120	178
	Richfield	1,476	164,852	16,372	304



nation, once overlooked, will get a close investigation by earth scientists.

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
	Santa Fe Springs	753	600,697	11,218	242
	Seal Beach	1,236	187,989	11,900	176
	Torrance	2,747	182,332	17,591	364
	Wilmington	65,382	1,681,810	697,935	2,335

COLORADO

Rangely	20,284	513,615	158,379	369
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FLORIDA

Jay	33,166	75,383	237,617	85
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ILLINOIS

Clay City	2,713	307,937	17,063	2,138
Dale	389	100,403	4,597	495
Lawrence	812	362,201	4,600	2,631
Loudon	2,693	363,553	21,447	1,234
Main	870	223,974	2,100	3,101
New Harmony	1,380	155,355	14,645	980
Salem	2,783	355,773	14,227	1,228

KANSAS

Bemis-Shutts	1,933	218,408	16,592	925
Chase-Silica	1,185	250,429	9,571	1,033
Eldorado	1,085	279,932	10,068	760
Hall-Gurney	1,821	127,244	12,756	1,175
Kraft-Prusa	866	117,824	7,176	590
Trapp	1,332	207,023	12,977	919

LOUISIANA, ONSHORE

Avery Island	1,252	78,808	31,192	38
Bay DeChene	5,464	74,815	52,165	80
Bay St. Elaine	4,804	143,406	56,494	95
Bayou Sale	2,793	145,141	29,859	91
Black Bay West	7,068	91,538	58,462	145
Calliou Island	18,023	516,898	183,102	361
Cote Blanche Island	6,982	78,996	51,004	58
Delta Farms	916	110,053	9,947	41
Garden Island Bay	8,403	174,829	81,508	249
Golden Meadow	2,256	115,299	19,701	207
Grand Bay	3,934	152,533	52,467	161
Hackberry East	1,753	93,492	16,508	85
Hackberry West	2,944	117,896	22,104	158
Iowa	1,250	92,363	7,637	37
Jennings	280	111,689	3,311	84
Lafitte	5,727	212,532	45,463	244
Lake Barre	4,613	170,632	49,369	119
Lake Pelto	3,110	100,747	34,253	66
Lake Salvador	1,662	75,472	34,528	50

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
	Lake Washington	6,488	198,674	76,326	144
	Leeville	2,419	125,226	24,774	92
	Paradis	4,057	103,213	26,131	75
	Quarantine Bay	3,523	149,648	35,352	122
	Romere Pass	2,218	80,347	24,653	37
	Timbalier Bay	7,985	234,619	192,126	355
	Venice	4,400	158,185	46,815	115
	Vinton	2,994	122,886	17,114	177
	Weeks Island	6,446	200,175	89,825	82
	West Bay	6,679	176,543	63,457	198
	W. Cote Blanche Bay	7,880	147,316	102,684	322

LOUISIANA, NORTH

Caddo-Pine Island	3,348	313,014	26,986	7,370
Delhi	6,583	165,956	44,044	105
Haynesville (Ark., La.)	1,644	171,874	13,126	190
Homer	318	92,227	8,005	153
Rodessa, (La., Tex.)	351	175,474	4,526	145

LOUISIANA, OFFSHORE

Bay Marchand Blk. 2 (Incl. onshore)	32,632	429,534	220,466	293
Eugene Island Blk. 126	4,429	89,207	35,803	53
Eugene Island Blk. 175	8,059	37,300	82,700	76
Eugene Island Blk. 276	4,687	46,769	118,231	60
Eugene Island Blk. 330	19,747	40,488	190,754	120
Grand Isle Blk. 16	13,156	211,052	138,948	92
Grand Isle Blk. 43	20,999	163,669	206,403	230
Grand Isle Blk. 47	3,972	65,069	34,931	71
Main Pass Blk. 35	2,155	79,768	20,232	77
Main Pass Blk. 41	10,396	144,519	135,481	100
Main Pass Blk. 69	7,973	191,010	68,990	132
Main Pass Blk. 306	5,573	31,942	118,058	134
Ship Shoal Blk. 204	5,732	27,140	77,860	58
Ship Shoal Blk. 207	6,223	44,419	130,581	53
Ship Shoal Blk. 208	10,559	92,506	132,494	86
South Marsh Island Blk. 73	5,020	40,848	64,152	37
South Pass Blk. 24 (Incl. onshore)	15,223	371,476	118,524	436
South Pass Blk. 27	11,568	258,826	126,074	342
South Pass Blk. 62	6,446	48,402	141,598	64
South Pass Blk. 65	10,105	46,193	143,807	62
Timbalier Bay Blk. 21	9,449	159,698	100,111	221
West Delta Blk. 30	22,586	312,462	137,538	216
West Delta Blk. 58	10,035	38,091	111,909	81
West Delta Blk. 73	7,654	128,219	146,781	96

MISSISSIPPI

Baxterville	6,853	167,013	67,987	198
Heidelberg	5,039	115,229	34,771	263
Tinsley	2,543	196,017	23,983	184

MONTANA

Bell Creek	9,345	68,819	47,126	228
Cut Bank	3,189	138,439	58,718	839
Pine	2,904	78,601	21,416	112

NEW MEXICO

Caprock and East	484	92,810	7,190	614
Denton	1,561	124,675	15,325	188
Empire Abo	12,267	111,171	88,829	251
Eunice	4,079	126,215	31,776	806
Hobbs	4,722	221,451	33,232	412
Maljamar	5,854	104,105	60,895	819
Monument	387	210,412	29,588	114
Vacuum	13,152	274,986	125,014	972

NORTH DAKOTA

Beaver Lodge	3,117	78,510	21,506	138
Tioga	953	56,253	29,480	215

OKLAHOMA

Allen	2,540	126,921	13,079	1,500
Avant	360	106,602	2,398	645

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
	Bowlegs	1,665	158,492	6,508	175
	Burbank	3,685	504,039	36,961	1,070
	Cement	1,280	140,236	14,764	1,465
	Cushing	2,965	463,182	21,818	1,700
	Earlsboro	620	216,424	3,576	200
	Edmond West	625	155,147	4,853	450
	Eola-Robberson	3,720	107,977	32,023	485
	Fitts	2,565	150,873	12,127	635
	Glenn Pool	1,980	309,421	10,579	1,035
	Golden Trend	8,135	402,011	97,989	1,200
	Healdton	7,575	294,240	25,760	1,460
	Hewitt	6,595	218,986	31,014	1,180
	Little River	330	159,901	5,099	165
	Oklahoma City	2,000	733,896	16,104	265
	Postle	6,780	70,560	60,102	285
	Seminole Greater	1,010	199,456	10,544	255
	Sho-Vel-Tum	34,250	1,002,456	247,544	8,040
	Sooner Trend	9,810	199,414	50,586	2,975
	St. Louis	1,100	216,145	8,855	610
	Tonkawa	275	135,212	1,788	205

TEXAS

District 1					
	Darst Creek	1,731	141,384	18,616	864
	Luling-Branyon	1,345	147,162	12,838	1,403
District 2					
	Greta All	4,476	116,951	43,049	191
	Lake Pasture	4,439	65,537	44,112	212
	Refugio All	314	95,160	4,840	67
	Tom O'Connor	25,667	496,410	203,590	830
	West Ranch	14,560	76,469	298,531	624
District 3					
	Anahuac	8,949	248,759	106,241	234
	Barbers Hill	497	124,529	10,471	100
	Conroe	21,737	540,659	134,341	588
	Dickinson-Gillock	1,839	107,953	42	70
	Goose Creek & East	760	130,749	9,551	221
	Hastings E&W	27,912	502,991	172,009	439
	High Island all	1,204	130,859	19,141	98
	Hull-Merchant	1,521	193,909	11,091	385
	Humble all	1,473	161,839	28,161	413
	Magnet Withers all	3,025	80,931	44,069	286
	Old Ocean	577	121,307	8,693	37
	Oyster Bayou	5,520	94,837	51,667	35
	Raccoon Bend	2,002	91,721	33,279	135
	Sour Lake	925	117,386	7,614	334
	Spindletop	171	153,741	3,259	72
	Thompson all	16,319	370,071	129,929	305
	Tomball	2,932	103,647	32,217	216
	Webster	24,762	412,958	162,042	148
	West Columbia	1,018	157,514	12,486	193
District 4					
	Aqua Dulce-Straiton	2,122	138,000	32,000	393
	Borregas all	2,072	108,293	26,707	502
	Kelsey all	2,125	107,518	42,482	344
	Plymouth	802	116,718	8,282	103
	Seeligson all	2,453	263,203	61,797	433
	Tijerina-Canales-Blucher	3,867	100,528	64,472	182
	White Point East	909	99,681	10,319	154
District 5					
	Mexia	129	107,353	2,647	97
	Powell	92	130,063	937	37
	Van and Van Shallow	16,264	419,384	130,616	427
District 6					
	East Texas	72,312	4,241,715	1,758,285	13,360
	Fairway	13,741	123,703	76,234	97
	Hawkins	39,630	535,697	289,303	464
	Neches	4,819	60,132	39,868	166
	Quitman all	3,360	80,205	29,469	246
	Talco	3,773	237,534	32,466	608
District 7-B					
	Eastland County	241	120,482	12,410	294
	Stephens County	1,877	169,155	18,002	558

State	Field	1974 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
District 7-C					
	Big Lake	500	124,664	10,336	101
	McCamey	794	124,089	5,911	884
	Pegasus	2,568	113,008	26,992	181
District 8					
	Andector	6,538	128,037	56,963	93
	Block 31	6,267	143,861	46,139	120
	Cowden North	14,954	276,820	48,180	1,042
	Cowden South, Foster Johnson	16,714	299,613	100,387	1,310
	Dollarhide	5,843	150,205	59,795	147
	Dune	7,448	126,476	73,524	899
	Emma & Triple N	1,993	96,694	18,306	259
	Fullerton all	6,756	238,417	61,583	579
	Goldsmith all	17,431	578,658	96,342	2,761
	Hendrick	654	252,215	2,785	196
	Howard Glasscock	6,902	310,153	64,847	1,892
	Tatan East	4,197	86,412	38,588	873
	Jordan	3,426	102,424	27,576	336
	Kermitt	934	112,374	17,626	469
	Keystone	5,101	272,902	47,098	792
	McElroy	11,820	309,518	50,482	1,970
	Means all	6,644	146,249	63,751	376
	Midland Farms all	6,396	176,039	48,961	337
	Penwell	1,485	84,967	15,033	472
	Sand Hills	5,092	189,105	55,895	1,069
	Shafter Lake	2,325	72,033	27,967	436
	TLX all	3,656	236,342	28,658	730
	Waddell	2,788	81,605	28,395	425
	Ward South	546	96,643	3,357	472
	Ward Estes North	6,170	310,174	64,826	1,966
	Yates	18,192	605,446	994,556	584

District 8-A					
	Anton	7,443	78,354	31,646	177
	Anton Irish	4,800	73,727	41,112	146
	Cogdell Area	10,237	187,918	132,082	386
	Diamond M	6,864	197,028	77,972	461
	Kelly-Snyder	76,433	616,472	491,640	680
	Levelland	12,391	232,508	92,492	1,617
	Prentice	5,932	93,846	46,154	308
	Russell all	2,697	112,041	22,959	224
	Salt Creek	13,093	126,663	103,337	119
	Seminole all	20,102	219,347	95,653	375
	Slaughter	47,033	595,465	194,535	2,526
	Spraberry Trend	18,190	379,633	130,367	3,669
	Wasson all	86,784	703,095	629,453	2,117
	Welch	6,160	88,531	61,469	391

District 9					
	Archer County	2,640	238,970	20,411	4,119
	Cooke County	2,106	94,713	18,642	1,981
	KMA	2,051	167,376	17,624	399
	Walnut Bend	4,711	101,145	38,855	278
	Wichita County	4,787	504,852	41,675	6,875
	Wilbarger County	1,976	159,717	21,112	1,782
	Young County	1,563	142,237	19,666	2,483

District 10					
	Panhandle	12,347	1,283,585	131,415	10,268

UTAH

	Greater Altamont	21,898	46,197	228,435	223
	Greater Aneth	7,927	259,554	55,558	403
	Greater Red Wash	3,364	90,433	46,541	215

WYOMING

	Elk Basin (Wyo.-Mont.)	8,887	448,442	69,759	255
	Garland	3,441	112,260	25,863	207
	Grass Creek	2,764	140,295	24,605	248
	Hamilton Dome	4,454	218,253	35,527	246
	Hilgert	7,358	48,299	85,552	165
	Lance Creek	348	104,632	2,359	44
	Lost Soldier	3,425	141,618	23,659	62
	Oregon Basin	11,354	240,315	79,651	321
	Salt Creek	13,284	542,518	82,113	1,329

Source of U.S. Imports

(Average in 1,000 b/d)

Country of origin	Jan.	Feb.	Mar.	Apr.	May	June	6-month average	Percent of total
Crude oil								
Algeria				77	264	303	108	3.2
Bahamas	74	17	61	87	94	150	81	2.4
Canada	1,044	907	900	947	1,015	841	943	28.3
Ecuador	95	63	90	122	82	89	90	2.7
Indonesia	147	237	216	313	188	237	222	6.6
Iran	265	288	434	479	609	434	420	12.6
Netherlands Antilles	43	30	78	72	122	420	128	3.8
Nigeria	321	367	579	431	716	677	517	15.5
Saudi Arabia				122	304	377	135	4.1
Trinidad	61	57	56	113	146	147	97	2.9
Tunisia	1			27	83	37	25	0.8
Venezuela	473	372	398	407	357	399	401	12.0
Virgin Islands	19	25	18	66	63	42	39	1.2
Others	146	92	78	140	267	47	129	3.9
Total	2,689	2,455	2,908	3,402	4,310	4,200	3,335	100.0
Refined oil								
Algeria				63	17	10	15	0.6
Bahamas	143	167	214	165	130	122	157	6.5
Canada	228	229	209	191	205	120	197	8.2
Italy	109	146	136	90	105	63	108	4.5
Netherlands Antilles	608	638	442	386	404	124	432	17.9
Nigeria	21	31	29	10	3	37	22	1.0
Trinidad	117	119	201	146	200	171	160	6.6
Venezuela	768	793	781	625	480	436	646	26.3
Virgin Islands	443	359	275	243	276	354	325	13.5
Others	319	307	273	431	255	510	348	14.4
Total	2,756	2,789	2,560	2,350	2,075	1,947	2,410	100.0
Total petroleum								
Algeria				140	281	313	123	2.1
Bahamas	217	184	275	252	224	272	238	4.1
Canada	1,272	1,136	1,109	1,138	1,220	961	1,140	19.8
Ecuador	95	63	90	122	82	89	90	1.6
Indonesia	158	292	224	321	196	243	238	4.1
Iran	278	296	452	507	616	468	437	7.6
Italy	121	146	143	90	105	81	114	2.0
Netherlands Antilles	651	668	520	458	526	544	560	9.8
Nigeria	342	398	608	441	719	714	539	9.4
Saudi Arabia				139	312	427	147	2.6
Trinidad	178	176	257	259	346	318	257	4.5
Tunisia	1			27	83	37	25	0.4
Venezuela	1,241	1,165	1,179	1,032	837	835	1,047	18.2
Virgin Islands	642	384	293	309	339	396	364	6.3
Others	429	336	318	518	499	449	426	7.5
Total	5,445	5,244	5,468	5,753	6,385	6,147	5,745	100.0

Source: Federal Energy Office estimates.

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Revised drilling forecast for 1974—U.S. and Canada

State	First half estimate—5 mos. actual				1974 12 mos. forecast				All wells change from '73
	Total comp.	Wildcats	Field wells	Total ft (1,000 ft)	Total wells	Wildcats	Field wells	Total ft (1,000 ft)	
Alabama	69	41	28	645	140	36	54	1,278	+ 38
Alaska	7	2	5	57	38	15	23	361	+ 3
Arizona	10	5	5	69	15	10	5	104	+ 7
Arkansas	145	38	107	795	329	169	160	1,939	+ 37
California	704	94	610	2,479	1,652	230	1,422	5,342	327
Onshore	668	86	582	2,400	1,561	214	1,347	5,051	+ 299
Offshore	36	8	28	79	91	16	75	291	+ 28
Colorado	455	163	292	1,821	925	427	498	3,702	+ 85
Florida (9 offshore last '73)	38	21	17	462	87	62	25	1,058	+ 20
Georgia	5	5	0	30	6	6	0	36	+ 3
Idaho	9	9	0	72	11	11	0	88	+ 5
Illinois	290	66	224	697	621	197	424	1,436	+ 10
Indiana	145	66	79	222	285	130	155	437	+ 26
Kansas	1,329	379	950	4,035	2,789	965	1,824	8,467	+ 675
Kentucky	328	94	234	553	702	171	531	1,184	+ 41
Louisiana	1,359	255	1,104	10,184	3,225	865	2,360	25,559	+ 285
North	513	54	459	1,730	1,014	142	872	3,419	+ 179
South	449	129	320	4,686	1,222	412	810	12,753	+ 31
Offshore	397	72	325	3,768	989	311	678	9,387	+ 75
Maryland	2	2	0	16	2	2	0	16	+ 1
Michigan	127	81	46	627	317	181	136	1,566	+ 36
Mississippi	223	157	66	1,791	500	347	153	4,016	+ 139
Missouri	11	11	0	10	12	12	0	11	+ 3
Montana	260	154	106	847	789	437	352	2,571	+ 142
Nebraska	94	61	33	498	210	140	70	1,112	+ 47
Nevada	1	1	0	7	2	2	0	14	+ 2
New Mexico	517	111	406	3,099	1,139	286	853	6,823	+ 41
East	363	85	278	2,213	789	211	578	4,809	+ 200
West	154	26	128	886	350	75	275	2,014	+ 159
New York	138	7	131	212	162	18	144	249	+ 1
North Carolina	10	10	0	38	11	11	0	42	+ 11
North Dakota	52	30	22	319	126	67	59	868	+ 2
Ohio	881	89	792	3,492	1,782	180	1,602	7,064	+ 278
Oklahoma	1,473	189	1,284	8,484	3,121	420	2,701	17,977	+ 718
Oregon	0	0	0	0	0	0	0	0	- 3
Pennsylvania	531	32	499	1,023	1,079	78	1,001	2,458	- 63
South Dakota	3	2	1	24	8	6	2	63	- 14
Tennessee	47	28	19	77	101	59	42	165	+ 1
Texas	4,976	1,563	3,413	26,024	10,323	3,353	6,970	54,570	+ 1,829
District 1	347	117	230	1,394	719	240	479	2,888	+ 198
District 2	341	182	159	1,917	728	400	328	4,093	+ 248
District 3	419	217	202	2,779	980	520	460	6,500	+ 146
District 4	460	189	271	2,987	961	419	542	6,240	+ 203
District 5	72	38	34	403	152	82	70	851	+ 67
District 6	140	53	87	919	331	120	211	2,172	+ 16
District 7-B	756	245	511	2,539	1,426	508	918	4,789	+ 521
District 7-C	429	95	334	2,475	844	184	660	4,710	- 25
District 8	693	66	627	4,401	1,460	162	1,298	9,579	+ 82
District 8-A	438	78	360	2,113	896	166	730	4,322	- 79
District 9	505	145	360	1,521	1,048	264	784	3,085	+ 140
District 10	261	36	225	1,586	536	75	461	3,258	+ 142
Offshore	115	102	13	990	242	213	29	2,083	+ 170
Utah	95	26	69	902	225	89	136	2,023	+ 29
Virginia	30	1	29	138	36	7	29	166	+ 27
West Virginia	308	50	258	1,007	787	109	678	2,451	+ 86
Wyoming	404	211	193	2,725	1,059	499	560	6,617	+ 139
Total U.S.	15,076	4,054	11,022	73,481	32,616	9,647	22,969	161,833	5,014
Canada	1,708	775	933	6,902	3,364	1,368	1,996	11,675	- 1,541
Western	1,616	768	848	6,717	3,253	1,358	1,895	11,393	- 1,486
Alberta	1,390	638	752	5,602	2,890	1,184	1,706	9,728	- 891
B.C.	127	57	70	596	166	72	94	873	+ 1
Manitoba	3	3	0	5	11	7	4	18	- 5
Northern	48	47	1	373	60	59	1	440	- 41
Saskatchewan	48	23	25	141	126	36	90	334	- 550
Eastern Offshore	7	7	0	75	10	10	0	110	- 20
Ontario	85		85	110	101		101	172	- 30
Eastern	0	0	0	0	0	0	0	0	- 5

How gasoline prices fared in 52 cities

(First half average of major-brand regular in ¢/gal)

	Price ex. tax		Pump price	
	1974	1973	1974	1973
Albany	41.1	27.9	53.1	39.9
Albuquerque	39.4	26.9	50.4	37.9
Amarillo	34.2	24.9	43.2	33.9
Atlanta	37.9	26.1	49.4	37.6
Baltimore	38.7	26.1	51.7	39.1
Birmingham	38.6	25.9	50.6	37.9
Boston*	37.9	26.1	49.4	37.6
Buffalo	41.1	27.4	53.1	39.4
Charlotte	38.6	25.9	51.6	38.9
Cheyenne	33.3	27.1	44.3	39.1
Chicago*	40.7	27.4	53.7	40.4
Cleveland	39.6	26.9	50.6	37.9
Corpus Christi	34.7	24.2	43.7	33.2
Dallas	34.7	24.2	43.7	33.2
Denver	41.1	27.4	52.1	38.4
Des Moines	37.9	26.9	48.9	37.9
Detroit	38.9	25.4	51.9	38.4
Fort Worth	34.7	24.2	43.7	33.2
Houston	36.0	24.2	45.0	33.2
Indianapolis	40.8	26.2	52.8	38.2
Jacksonville	38.6	25.7	50.6	37.7
Kansas City	40.5	26.6	51.5	37.6
Little Rock	36.4	24.4	47.9	35.9
Louisville	41.8	27.4	52.8	38.4
Los Angeles	38.1	25.5	49.1	36.5
Memphis	37.9	25.7	48.9	36.7
Miami	37.4	25.4	49.4	37.4
Milwaukee	40.6	27.0	51.6	38.0
Minn.-St. Paul	38.9	27.9	49.9	38.9
Newark	39.4	27.9	50.4	38.9
New Orleans	27.6	24.4	49.6	36.4
New York*	42.6	28.9	55.6	41.9
Norfolk	35.4	23.7	48.4	36.7
Oklahoma City	39.3	26.3	49.9	36.9
Omaha	40.3	26.9	52.8	39.4
Philadelphia	38.6	25.9	50.6	37.9
Phoenix	38.3	27.0	49.3	38.0
Pittsburgh	38.6	25.9	50.6	37.9
Portland, Ore.	39.0	26.2	50.0	37.2
Salt Lake City	39.1	25.7	50.1	36.7
San Antonio	34.2	24.2	43.2	33.2
San Diego	37.8	26.3	48.8	37.3
San Francisco	38.8	26.2	49.8	37.2
Seattle	37.3	25.3	50.3	38.3
Spokane	37.8	24.9	50.8	37.9
Springfield, Ill.*	38.9	26.9	51.9	39.9
St. Louis	40.8	27.7	51.8	38.7
Tampa	37.4	25.4	49.4	37.4
Texarkana	34.2	23.8	43.2	32.8
Tulsa	37.3	25.8	47.9	36.4
Wichita	39.6	26.2	50.6	37.2
Wichita Falls	34.2	24.0	43.2	33.0

Avg. for 6 months 38.30 26.02 49.58 37.27

*Pump price includes local tax ranging from 0.5 to 2.0¢/gal. †Jan. through June, not column totals.

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Foreign posted crude prices

(Prices effective July 1, 1974)

	\$/bbl
Algeria:	
All 44.00°-44.09°	16.216
Libya:	
All 40.00°-40.09°	15.768
Nigeria:	
All 34.00°-34.09°	
Bonny	14.691
Forcados	14.691
All 27.00°-27.09°	
Bonny	14.481
Middle East, Persian Gulf:	
Arabian, 34.00°-34.09°	
Ras Tanura	11.651
Arabian, 31.00°-31.09°	
Ras Tanura	11.561
Iranian, 34.00°-34.09°	
Kharg Island	11.875
Iranian, 31.00°-31.09°	
Kharg Island	11.635
Kuwait, 31.00°-31.09°	
Mina al Ahmadi	11.545
Oman, 34.00°-34.09°	
Mina al Fahal	12.298
Qatar, 40.00°-40.09°	
Um Said	12.414
Qatar, 36.00°-36.09°	
Halul Island	12.013
Iraq, 35.00°-35.06°	
Khor al Amaya	11.671
Abu Dhabi, 37.00°-37.09°	
Das Island	12.086
Abu Dhabi, 39.00°-39.09°	
Jebel Dhanna	12.636
Abu Dhabi, 40.00°-40.09°	
Zakum	12.563
Middle East, E. Mediterranean:	
Arabian, 34.00°-34.09°	
Sidon	13.647
Iraq, 36.00°-36.09°	
Tripoli & Banias	No posted price
Far East:	
Brunei, Seria Light 36°	
Lutong, Sarawak	No posted price
Malaysia (Sarawak)	
Lutong, Sarawak (various)	12.60
Indonesia (all crude)	12.60
Canada: (Canadian dollars)	
Leduc-Woodbend (Alberta)	6.70
Redwater (Alberta)	6.58
Weyburn (Sask.)	6.17
Boundary Lake (B.C.)	6.12
South America:	
Bolivia (various)	16.00
Ecuador, 28.00°-28.09°	
Esmeraldas	13.70
Venezuela, includes \$1.9086/bbl freight premium, excludes low-sulfur premiums ranging up to \$1.05/bbl, posted price	
15°	13.0458
20°	13.3457
25°	14.1792
30°	14.4928
35°	14.8064
40°	15.1201

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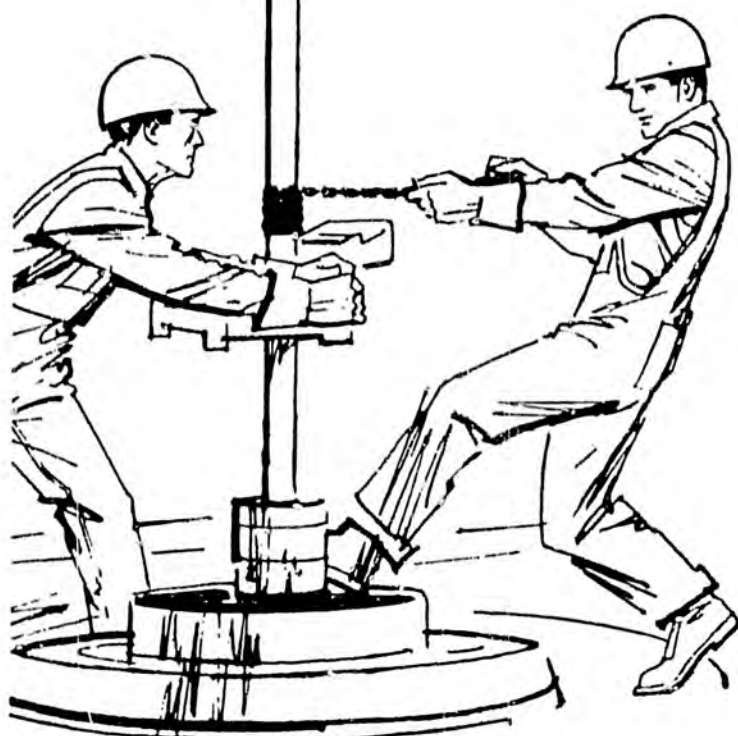
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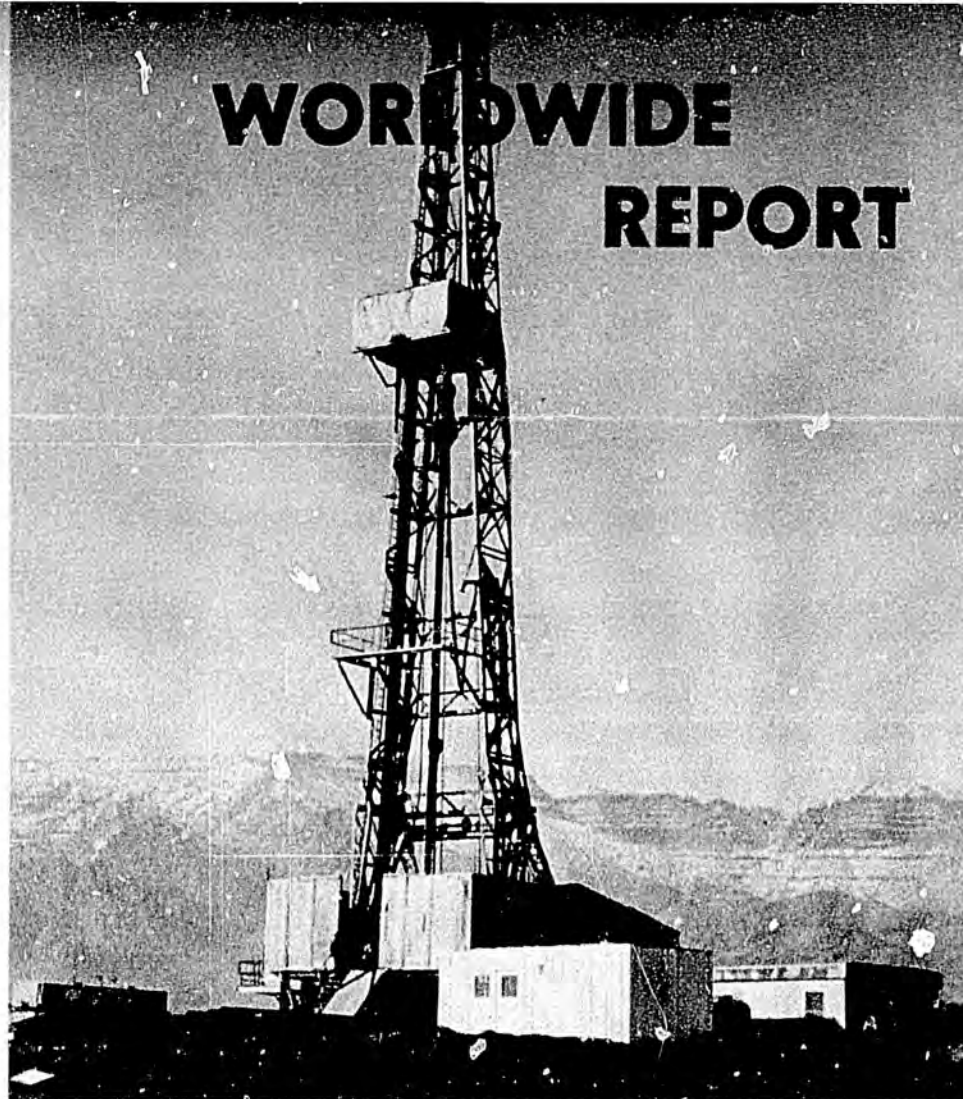
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NATIONAL Iranian Oil Co. is directing a major drilling program at proving up gas reserves for a gas-injection program that will peak at 13 billion cfd. This rig is working in mountainous Central Iran.

WORLDWIDE REPORT



Changes restructuring worldwide oil

FRANK J. GARDNER
International Editor

1974 WILL be remembered as the year of earthquake change in the structure and operational procedures of the oil industry.

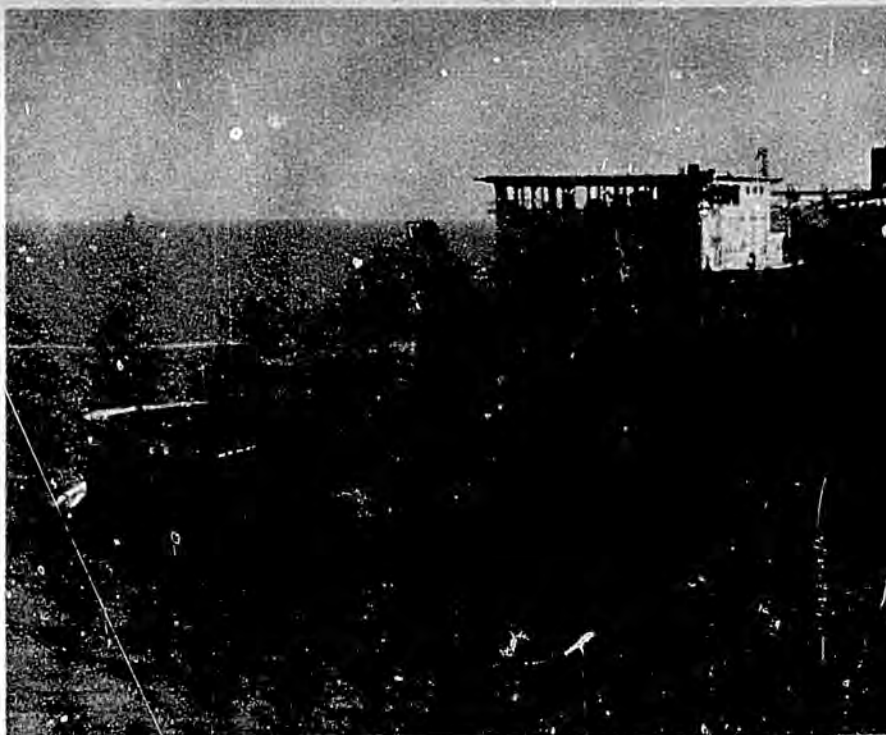
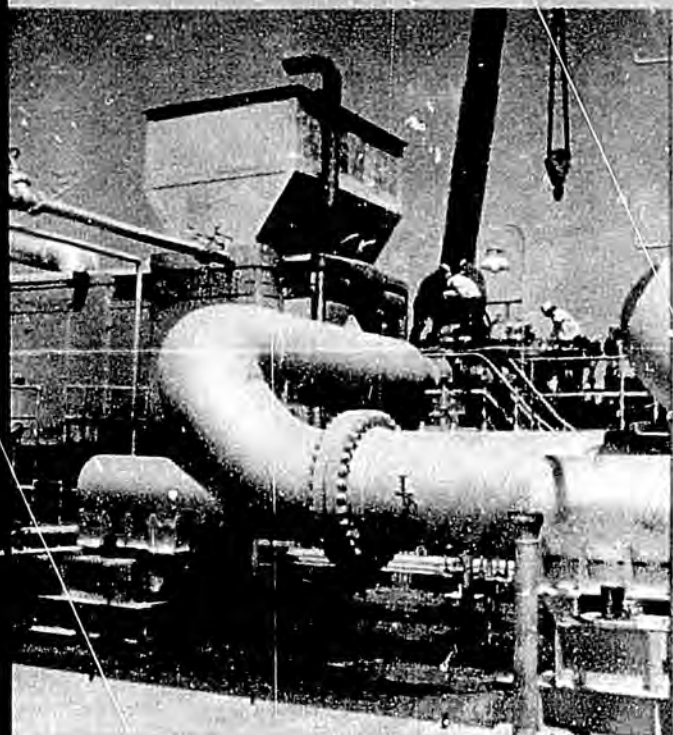
It marked the transfer of power from the international oil companies to the producing-country governments. The year saw the economies of many consuming countries threatened as their oil bills mounted due to the politically controlled crude prices. And it saw the Organization of Petroleum Exporting Countries (OPEC) ascend to new heights in world power as oil prices continued to increase.

The effects of the unilateral OPEC price boosts, which continued throughout the year without letup, are just beginning to be felt. Their full impact will descend on the world economy in 1975, when international payment balances are totted up.

Through all the price pressure, Saudi Oil Minister Yamani emerged as the spokesman for those in the producing nations who were promoting a decrease in crude prices.

At the turn of the year, the Arab members of OPEC began to relax the embargoes and production cutbacks they had imposed after the war of October, 1973. But the Dec. 23 announcement of yet-higher crude prices—128% higher, to be exact—stunned industrial (and non-industrial) countries.

There followed many weeks of government-to-government oil-barter deals. It was every country for itself as the major powers dispatched their ministers to the Middle East to court the Arabs' favor.



WATER injection, via this pump station (left) and others like it, helps maintain the amazing productive muscle of Saudi Arabia's giant Ghawar

oil field, the world's biggest. Ghawar produced 4.6 million b/d during the first 6 months from 375 wells, hitting 9.96 billion bbl cumulative—

Britain, France, West Germany, Italy, Spain, and the developing countries sent their diplomats to secure their future supplies of oil. In return, they were peddling rice, steel, cement, rubber, plastics, fibers, arms, entire refineries and petrochemical complexes.

Had they not been still locked out by the Arab embargo, the U.S. and Holland might also have joined the parade to the Middle East.

Some impressive deals were sealed, but few have come to full fruition. France made a \$2-billion arms-for-oil pact with the Saudis, and a \$5-billion

10-year contract with Iran, the biggest and most important agreement ever reached between an oil-producer and a consumer country. It involved an exchange for crude of nuclear power plants (first in the Middle East), pipelines, refineries, gas-liquefaction plants, methane tankers, and a petrochemical complex.

The hand of the French then turned to Libya and signed a similar deal, said to be about equal to that with Iran.

Britain made a \$275-million bargain with Iran, trading manufactured goods for 37 million bbl of Iranian crude.

Italy jumped into the play and traded a broad spectrum of industrial goods and tanker-construction promises for 220 million bbl of Libyan oil. Japan promised a \$1-billion loan to the Iraqis for industrial projects in return for 650 million bbl of crude over the next 10 years.

Ironically, neither trading side was certain it could fulfill the terms of the agreements. The materials offered the producing nations were often in short supply at home in the industrial countries, while the producers were far from certain how much crude they'd be lifting under the participa-

Refining capacity gains in non-Communist world

REFINING capacity in non-Communist countries outside the U.S. and Canada will be just over 40 million b/d on Jan. 1, 1975, according to the Journal's detailed world-wide survey.

The 40.3-million-bbl/d compares with 38.3 million b/d on Jan. 1, 1974, for a 5.2% growth. Projected crude capacities for the next two years are 41.5 million b/d on Jan. 1, 1976, and 42.9 million b/d on Jan. 1, 1977.

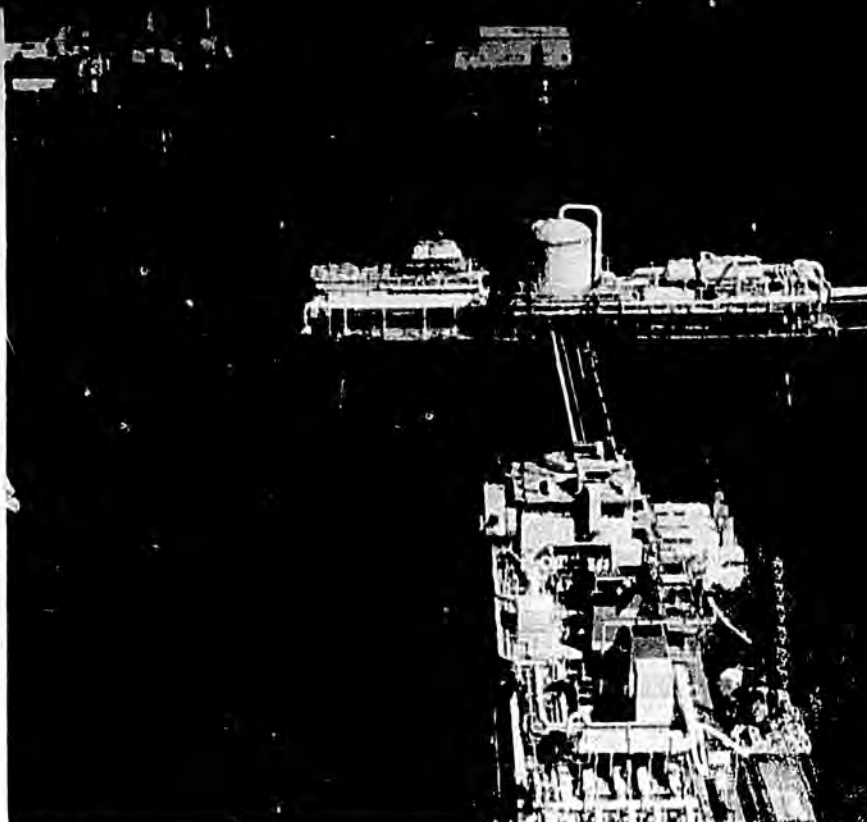
Biggest increases in crude capacity the past year came in western Europe, where a 650,000-b/d gain was chalked

up. The Asia-Pacific area increased crude capacity by just over 460,000 b/d, while the increase in the Middle East was just under 400,000 b/d.

Catalytic cracking capacity in non-Communist countries outside the U.S. and Canada will stand at 2.36 million b/d on Jan. 1, 1975. This is a slight increase over the 2.33 million b/d figure on Jan. 1, 1974. The next two years should see small additions, to 2.41 and 2.48 million b/d on Jan. 1, 1976 and Jan. 1, 1977.

Catalytic-reforming capacity for this part of the world stood at 3.57 million b/d at the beginning of 1974, and will be 3.77 million b/d on Jan. 1, 1975. Reforming capacity should increase to 3.89 and 4.17 million b/d at the beginnings of 1976 and 1977.

Hydroprocessing has shown good growth in these countries, and increased growth is anticipated. Capacity this coming Jan. 1 will be 11.3 million b/d, up from the 10.6-million-b/d figure of a year ago. The first of 1976 and 1977 should see combined hydroprocessing capacity grow to 11.6 and 11.9 million b/d.



also a world record. At center, ARCO-lipco group's big 1-million-bbl crude-storage barge, ARCO Ardjuna, nears completion of its second

year of operation off Java. At right new waterflood plant (upper left in photo) will boost oil flow from Fateh field off Dubai.

tion pacts that were then in force.

To remedy this, the Middle East states launched a campaign to increase their participation percentages. One by one throughout the year, they succeeded in boosting the old 25% share to 35, 55, and finally 60% which is now standard in all the gulf states. Today, this too is fading, as the 100% takeover is in fashion, and there's little doubt that in 1975, following the Saudis' lead, nearly all OPEC members will take over full control.

Auctions fall. Parallel with the participation campaigns, several OPEC states decided to offer their much-

wanted crude at public auctions. Such public sales at the height of the late-1973 supply crisis had fetched as much as \$20/bbl in Libya, Iran, and Nigeria.

But by February, crude prices had peaked, frozen, and started a slow decline. Some of the buyers at the 1973 auctions found themselves stuck with \$17-20 oil that now was selling far lower. Some canceled the sales outright, while others solved the problem by simply not picking up the loot.

As a result of new buyer caution, the Arab auctions of spring, 1974, failed miserably. All had demanded at least the posted price, but bids at

that level were few and far between. Kuwait got a top \$9/bbl bid. Abu Dhabi drew few bidders and postponed its auction, as did Qatar.

At last, in mid-March, the embargo on the U.S. was lifted, but Denmark and Holland remained on the Arab black list. Crude markets began a slow return to normal, if total confusion can be called normal. The embargo on Holland was to remain until July.

At the same time, OPEC decided the time had come to freeze prices. Saudi Arabia, Abu Dhabi, and Qatar dropped 40¢ off the Arab marker crude in early November and jumped

Capacity (1,000 b/cd) January 1, 1975				
Crude oil capacities	1-1-74	1-1-75	Projected 1-1-76	1-1-77
Asia-Pacific	8,933	9,397	9,600	9,900
Africa	1,092	1,245	1,500	1,800
Middle East	2,882	3,281	3,600	4,000
Latin America	7,266	7,635	8,000	8,400
Western Europe	18,110	18,758	18,800	18,800
Sub total	38,283	40,276	41,500	42,900
U.S. and Canada	15,171	17,323	18,000	18,500
Total, non-Communist	53,454	57,599	59,500	61,400

Capacity (1,000 b/cd) January 1, 1975				
Catalytic cracking	1-1-74	1-1-75	Projected 1-1-76	1-1-77
Asia-Pacific	515	539	560	590
Africa	60	61	63	65
Middle East	108	119	130	150
Latin America	636	649	660	675
Western Europe	1,010	990	1,000	1,000
Sub total	2,329	2,358	2,413	2,480
U.S. and Canada	4,940	5,109	5,200	5,300
Total, non-Communist	7,269	7,467	7,613	7,780

Capacity (1,000 b/cd) January 1, 1975				
Catalytic reforming	1-1-74	1-1-75	Projected 1-1-76	1-1-77
Asia-Pacific	850	909	1,000	1,100
Africa	139	156	180	200
Middle East	168	195	210	240
Latin America	329	283	300	330
Western Europe	2,088	2,226	2,300	2,300
Sub total	3,574	3,769	3,990	4,170
U.S. and Canada	3,568	3,809	4,000	4,200
Total, non-Communist	7,142	7,578	7,990	8,370

Capacity (1,000 b/cd) January 1, 1975				
Hydroprocessing	1-1-74	1-1-75	Projected 1-1-76	1-1-77
Asia-Pacific	3,309	3,490	3,600	3,800
Africa	259	307	350	390
Middle East	552	586	620	650
Latin America	1,377	1,415	1,500	1,600
Western Europe	5,067	5,470	5,500	5,500
Sub total	10,563	11,268	11,570	11,940
U.S. and Canada	6,897	7,554	8,000	8,500
Total, non-Communist	17,460	18,822	19,570	20,440

Worldwide oil at a glance

Country	Production		Reserves	Production		No.	Consumption		
	1973	1974		1973	1974		1973	1974	1975
ASIA-PACIFIC									
Afghanistan	85,000*	3,530	15	0.2*		11	722,176	137,550	159,850
Australia	2,300,000	38,000	373	370.6	0.7	1	30,450		1,620
Bangladesh		10,000				3	123,200		5,700
Brunei-Malaysia	2,500,000	22,000	519	327.0	0.6	2	28,300	2,000	
Burma	65,000	150	595	23.0					
China Republic (Taiwan)	15,000	1,000	60	3.3		1	244,100	9,040	20,800
Guam						1	29,500		
India	834,000	2,500	1,500	149.0	0.7	10	555,100	32,100	26,658
Indonesia	15,000,000	15,670	2,710	1,457.0	10.0	8	427,700	19,500	23,000
Japan	30,000	1,700	1,044	12.3		45	5,133,840	307,030	527,550
Khmer Republic						1	12,540		1,800
Korea, South						3	425,000		27,700
New Zealand	75,000*	5,000†	4	3.8	- 5.0	1	54,000		18,000
Okinawa (R.I.)						3	212,000		12,000
Pakistan	28,700	16,000	16	7.1	-16.5	3	79,210		2,500
Philippines						4	274,000	24,600	34,960
Singapore						5	845,650		20,000
Sri Lanka						1	34,400		3,400
Thailand	115,000	1,000	25	0.2		4	166,200	7,000	23,900
Vietnam, South†									
Total Asia-Pacific	21,047,700	115,880	6,861	2,353.5	4.2	107	9,397,360	530,820	909,438
*Condensate †Revised ‡Oil or gas discovered but not developed									
EUROPE									
Austria	182,000	953	1,271	47.0	- 6.0	1	220,000	16,300	23,000
Belgium						8	866,700	64,800	95,100
Cyprus						1	15,000		2,740
Denmark	247,000	500	6	4.0		3	220,000		36,700
Finland						2	196,000	32,000	25,800
France	142,000*	5,800	295	20.2	-19.2	24	3,341,600	189,900	439,930
Germany, West	550,000	11,473	2,699	125.4	- 6.9	33	2,986,723	126,550	363,520
Greece†						4	411,000		22,000
Ireland†						1	56,000		13,200
Italy-Sicily	750,000	12,000	111	18.3	- 9.4	34	3,952,660	268,500	387,370
Netherlands	250,000	94,800	347	27.4	- 2.1	7	1,840,700	75,000	164,800
Norway	7,300,000	24,700	6	30.0	200.0	3	168,000		18,500
Poland**									
Portugal						2	110,000	12,000	15,600
Romania**									
Spain	293,000	600	24	38.0	90.0	9	1,165,000		136,700
Sweden						5	248,000		47,300
Switzerland						2	138,000		23,600
United Kingdom	15,700,000	50,000	57	1.9	22.6	20	2,782,980	205,300	410,010
Yugoslavia	400,000	2,000	1,100	69.0	- 2.8				
Total Europe	25,814,000	202,826	5,916	301.2	3.0	159	18,718,363	990,350	2,225,870
*Includes 76 million bbl condensate †Oil or gas discovered but not developed **Not included in non-Communist total									
MIDDLE EAST									
Abu Dhabi	30,000,000	200,000	160	1,750.0	34.5				
Bahrain	336,000	6,600	211	68.0		1	250,000	34,200	15,200
Dubai	2,420,000	1,500	45	232.0	28.9				
Iran	66,000,000	330,000	369	6,128.0	0.6	5	789,000	36,000	60,665
Iraq	35,000,000	27,500	156	1,829.3	2.0	7	168,500		5,000
Israel	2,200	20	25	100.8*	-11.8	2	201,000		24,500
Jordan						1	21,223	4,403	
Kuwait	72,800,000†	32,000	692	2,600.0	- 7.4	5	646,000		19,600
Lebanon						2	53,500	7,250	7,300
Neutral Zone	17,300,000	7,500	449	485.4	- 4.3				
Oman	6,000,000	2,100	61	257.0	- 0.7				
Qatar	6,000,000	8,000	81	546.0	5.4	1	6,800		1,300
Saudi Arabia	164,500,000	55,000	670	8,400.0	11.7	3	610,300	8,210	20,490
Sharjah	1,500,000	1,500	3	50.0	100.0				
South Yemen (Aden)						1	169,100		9,000
Syria	1,500,000†	700	123	119.0	7.2	1	49,690		2,620
Turkey	500,000	250	313	65.3	0.5	4	315,500	28,600	29,660
Total Middle East	403,850,200	672,670	3,358	22,670.8	7.0	33	3,280,613	118,663	195,335
*Includes captured Sinai fields †Revised									

AFRICA
Algeria
Angola-Cabinda
Congo Republic
Dahomey*
Egypt
Ethiopia*
Gabon
Ghana*
Ivory Coast
Kenya
Liberia
Libya
Malagasy
Morocco
Mozambique*
Nigeria
Rhodesia
Senegal
Sierra Leone
Sudan
Tanzania
Tunisia
Union of S. Africa*
Zaire†
Zambia

Total Africa

WESTERN HEMISPHERE

Antigua
Argentina
Bahamas
Barbados
Bolivia
Brazil
Chile
Colombia
Costa Rica*
Cuba
Dominican Republic
Ecuador
El Salvador
Guatemala*
Honduras
Jamaica
Martinique
Mexico
Netherlands Antilles
Nicaragua
Panama
Paraguay
Peru
Puerto Rico
Trinidad & Tobago
Uruguay
Venezuela
Virgin Islands
United States
Canada

Total W. Hemisphere

Total Non-Communist

Communist World

Total World

RESERVE (1,000 bbl)			OIL PRODUCTION		SEVERING			
1,000 bbl	1,000 bbl	1,000 bbl	Estimated 1974	% change from 1973	No.	Crude	Refining	1,000 bbl
7,700,000	229,000	826	888.8	-19.2	4	115,335		30,500
1,175,000	1,400	181	161.5	6.9	2	35,680		1,800
4,874,000	1,000	52	51.2	12.0				
3,700,000	3,500	437	118.3	-42.8	1	18,000		
1,750,000	7,000	137	182.0	20.1	1	14,430		1,890
					1	17,000		2,000
					1	28,000		6,500
					1	42,940		4,420
					1	48,000		4,000
					1	11,000		2,000
26,600,000	26,500	979	1,700.0	-21.6	6	76,400		8,000
450	24	22	0.9		1	15,000		2,200
					2	58,550	3,660	7,580
20,900,000	45,000	1,088	2,300.0	15.0	1	17,000		2,500
					1	60,000		6,500
					1	(not operating—not included in total)		
					1	15,000		1,320
					1	10,000		
					1	22,000		2,000
					1	16,100		4,200
1,100,000	1,500	55	85.0	3.5	1	25,000		3,300
500,000	50				5	397,100	57,400	56,700
					1	16,150		2,700
					1	24,620		5,600
68,299,450	314,974	3,777	5,487.7	-7.2	40	1,083,305	61,660	155,710

*Oil or gas discovered, but not developed. †To go on production in 1976 at 25,000 b/d.

2,346,000	7,500	4,095	422.0		1	16,000		2,000
					14	720,718	101,185	51,370
25,000		8	0.3	100.0	1	500,000		
250,000	11,000	281	47.5	-5.0	5	3,000		
775,000	914	1,247	172.2	1.2	10	961,800	183,000	21,000
200,000	2,800	316	28.6	-15.9	3	123,500	26,300	10,000
900,000	4,000	2,078	169.7	-16.0	6	172,100	48,500	2,000
					1	11,000		1,500
					3	121,970	14,570	11,700
					2	45,500		7,000
2,500,000†	5,000	843	232.0	12.5	4	44,350		
					1	14,000		2,600
					2	24,800		5,500
					1	14,000		1,800
					1	32,600		3,000
					1	10,400		2,500
13,582,000	15,000	3,201	513.5	17.1	6	760,000	109,000	35,300
					2	900,000	35,000	15,000
					1	13,200		2,600
					1	100,000		7,500
					1	5,000		
2,500,000	5,000	2,422	69.7	-1.3	5	129,600	25,960	1,760
					3	283,800	47,800	75,500
2,500,000	6,000	3,020	181.3	9.9	2	461,000	26,500	27,000
					1	43,000	4,000	3,000
15,000,000*	43,000	12,450	3,025.0	-10.0	12	1,531,715	46,589	20,600
					1	590,000		
35,299,839	250,000	504,000	8,945.0	-2.9	247	14,216,287	4,156,720	3,022,235
9,400,000	52,500†	21,202	1,682.0	-6.5	42	1,877,550	399,150	309,090
85,277,839	402,714	555,263	15,488.8	-1.7	381	23,752,390	5,224,274	3,641,555

*Oil or gas discovered, but not developed. †Revised. **Does not include Orinoco heavy oil belt's estimated 700 billion bbl. ‡Does not include Arctic gas.

604,297,189	1,709,064	575,175	46,382.0	2.0	720	56,232,031	6,933,167	7,127,908
**111,400,000	846,000†		10,390.0	7.5				
715,697,189	2,555,064		56,722.0	3.0				

**Including Russia 82.4 billion, Mainland China 25 billion, others 3 billion. †Including Russia 812 trillion, Mainland China 25 trillion, Hungary 5 trillion, others 6 trillion.

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royalties to 20% and taxes to 85%. Net effect was a 55¢/bbl hike in average cost/bbl to the companies. Other OPEC nations voted at the December meeting in Vienna to join the three gulf states at the higher prices.

Solutions. What hope is there that the world can free itself of its OPEC chains? There are those who contend that crude prices can only continue in the ascendancy. Others differ. There are as many opinions as there are interviewees.

But there is hope. And it's a long-term proposition. But hope there is. The obvious solution, of course, is to find crude sources outside the OPEC orbit. Ironically, much of the relief to non-Communist consuming countries will come from big communist sources.

OPEC has three big markets—western Europe, Japan, and the U.S. And each of the three has something going for it in the way of new, non-OPEC sources.

Western Europe pins much of its hopes, of course, on the North Sea, provided the government politicians will stand aside and let it develop. Conservative sources now see at least a 42-billion-bbl ultimate reserve for the sea. Less conservative ones peg it as high as 79-138 billion. Only time will tell.

But western Europe has yet another ace—Russia. Production there overtook the U.S. in latter 1974, making the Soviet Union the world's biggest producer with an average daily output of 9.4 million bbl in October, up 7% above 1973. Almost all of the gain has come from the western Siberian oil fields, where the Soviets are developing new production at a feverish pace. One field—Samotlor—produces more than half of all western Siberian crude. In mid-November, its output was 1.5-million b/d, 39% more than at the beginning of the year. This gives some idea of the pace of Russian development.

Russia is scoring natural-gas production gains that are every bit as important as her crude increases. During the first 10 months of 1974, gas output jumped 10% over the same time slot in 1973.

The Soviets have discovered that oil and gas is big business. And they're making money at it. Oil and gas sales have bailed the big country out of a deepening foreign-exchange crisis and



NEW 132,000-b/d refinery for Total Raf. Nederland N.V. at Vlissingen, Netherlands, helped boost western Europe crude capacity this year.

delivered a 1973 surplus of more than 260-million rubles. That's \$359 million or £149 million.

Current oil reserves in the Soviet Union are estimated at 83.4-billion bbl, compared to 80 billion at the beginning of the year. Its gas reserves are set at a whopping 812-trillion cu ft, according to Soviet officials—that's 3.5 times Algeria's reserve, and 2.5 times those of Iran.

Russia must sell her oil and gas, and she eyes western Europe as a principal buyer. Already availability of new Russian gas supplies has disrupted the 1972 Eurogas agreement to supply Algerian gas to France, Belgium, West Germany, Austria, and Switzerland.

The Soviet Union, then, is western Europe's second big hope for oil and gas outside the OPEC circle.

Japan, too. OPEC's third-largest market also is vulnerable. In this instance, the two communist superpowers promise to sweep Japan completely out of the OPEC orbit in the years ahead.

Russia is building both a railway and a 620-mile big-inch pipeline from the Tyumen oil fields of western Siberia to her Pacific coast, where vast

amounts of crude will be made available to Japan and other Pacific markets, including the U.S.

More importantly, Mainland China, already providing nearly 200,000 b/d to Japan, is expected to have at least 2 million b/d available for export by 1980, and, according to Japanese oil officials, the Chinese expect to be producing, and exporting most of, 8 million b/d in the mid-1980's. That would put it in a class with Saudi Arabia.

The Chinese, like the Russians, have discovered that oil and gas is big business.

U.S. doubtful. OPEC's largest marketplace, the United States, could also find relief from OPEC sources, although total relief is more doubtful.

Its greatest hopes of course, are offshore and the closed-in giant fields on Alaska's North Slope. The sparsely explored regions of Alaska's slope holds vast undiscovered reserves, and when the Alyeska pipeline is finished, these will be uncovered at a rapid rate. Plans now call for the line to bring 1.2 million b/d by late 1977.

Higher crude prices have stimulated the search for oil and gas in the Lower 48 as well. Active rigs in the U.S.

during the first 9 months of this year were up by 26%, an indication that U.S. oilfinders have gone back to work in earnest.

Other forces. There are other, less tangible, forces eroding the OPEC image.

One is the very ubiquity of oil in the earth. Experience of the past few decades proves that oil and gas can and will be found in many parts of the world previously unsuspected as major sources. The North Sea is only one fantastic example of this. Reserves may not be as enormous as those of the Middle East, but 42-million bbl of oil is not to be sneezed at.

And another important discovery to watch is Mexico's Reforma trend in the southern states of Tabasco and Chiapas. Pemex has declined to officially estimate the reserves in Reforma, but some observers feel the find could be one of the giants of North America.

Another force at work is the improved technology that is constantly thrust into our oil-finder's hands. Their success ratios in the North Sea, the South American countries, and other parts of the world are enviable.

Prices a question. With so many forces working against it, OPEC may not be able to long afford the luxury of the attitudes displayed all this year.

International oil consultant Samuel Nakasian summed up the situation most succinctly when he told a New York seminar in mid-November:

"Fairly soon, OPEC must come to the realization that having achieved the discipline of its members to establish high price levels, it has also triggered the competition of new oil and gas supplies and other energy sources. At some point in the near future OPEC must consider whether its self-interest may not best be served by lowering prices in order to decelerate the development of competing sources of energy."

Abbreviations used with the refining tabulations (All figures in barrels per calendar day.)

All figures are
as of 1-1-75

Cracking processes:

FCC—Fluid cat cracking
TCC—Thermofor cat cracking
HD—Houdrflow cat cracking

Hydroprocessing:

DHC—Distillate hydrocracking
RHC—Residual hydrocracking
HDT—Catalytic hydrotreating
HDS—Catalytic hydrosulfurization

Other processing:

A—Asphalt
Alky—Alkylation
C—Coking (I/d)
L—Lube manufacture

P—Polymerization
V—Vacuum distillation
W—Waxes

CALENDAR DAY FIGURES reported in this survey are refiners' averages for how many barrels each day a refinery unit yields on the average, including downtime used for turnarounds. These figures are what refiners actually run in a year, divided by 365. (Stream day figures represent the potential a refinery unit can yield when running full capacity).

Worldwide refining

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
ALGERIA	Sonatrach:					
	Arzew	54,600		16,000	1,000 HDT	10,300 V, 1,500 L, 1,300 A
	El Borma	600				
	Hassi Messaoud	3,135				
	Maisin Carree	57,000		14,500		
	Total	115,335		30,500	1,000	
ANGOLA	Cabinda Gulf, Cabinda	2,800				
	Companhia de Petróleos de Angola (SARL), Luanda	32,880		1,800	5,850 HDS	1,800 V
	Total	35,680		1,800	5,850	
ANTIGUA	West Indies Oil Co. Ltd., St. John's	16,000		2,000	7,500 HDS	1,500 V, 750 A
ARGENTINA	Astrasur, Refinerías Pata- gónicas de Petróleo SA, Comodoro Rivadavia, Chu- but	6,800				4,800 V, 5,300 A
	Destilería Argentina de Petróleo SA, Lomas de Zamora	1,800				1,200 V, 500 L
	Esso SAPA, Campana	91,900	17,600 FCC	8,000		49,700 V, 1,300 L, 500 C
	Galván	17,000				
	Ragor SAIC, Quilmes	600				
	Refinería de Petróleo la Isaura SA, Bahía Blanca	12,580				
	Shell Compañía Argentina de Petróleo SA, Buenos Aires	115,000	21,000 FCC	9,000	25,000 HDT	
	Yacimientos Petrolíferos Fiscales:					
	Campo Durán	28,305				
	Dock Sud	5,975				1,572 V
	El Centauro, Tierra del Fuego	189				
	La Plata	289,000	44,973 FCC	17,185	3,800 HDT 9,435 HDS	64,158 V, 1,673 Alky, 3,450 L
	Luján de Cuyo	113,200	17,612 FCC	17,185	2,516 HDS	650 C, 9,230 A
	Plaza Huincul	5,032				59,577 V, 1,000 C
	San Lorenzo	33,337				9,435 V, 1,190 A
	Total	720,718	101,185	51,370	40,751	
AUSTRALIA	Amoco Australia Pty. Ltd., Bulwer Island	58,000	8,600 FCC	5,300	1,400 HDT 7,500 HDS	14,500 V, 1,400 Alky, 1,200 A
	Ampol Refineries Ltd., Lytton	60,000	19,000 FCC	13,000		26,000 V, 2,500 Alky, 1,500 P
	Australian Oil Refining Pty. Ltd., Kurnell	132,000	36,100 FCC	26,600		48,500 V, 3,200 Alky, 2,800 P
	Kurnell (lube refinery)				6,500 HDT	7,100 V, 3,600 L
	BP Australia Ltd., Westernport	57,000		18,000	15,300 HDT	3,150 V, 1,000 A
	BP Refinery (Kwinana) Pty., Kwinana	103,070	14,850 FCC	18,450	13,050 HDT 7,650 HDS	40,500 V, 2,200 L, 700 A
	Petroleum Refineries Australia Pty. Ltd., Adelaide	46,500		11,500	35,000 HDS	2,500 V, 2,600 A
	Altona	98,600	24,000 FCC	26,000	33,000 HDT 10,000 HDS	22,000 V, 2,000 Alky, 3,000 A
	Shell Refining (Australia) Pty. Ltd., Clyde	55,000	17,000 FCC	18,000	22,000 HDT 6,000 HDS	
	Geelong	92,000	18,000 FCC	17,000	36,000 HDT 11,000 HDS	
	Total Refineries Australia Ltd., Matraville	20,000		6,000	4,300 HDT 11,000 HDS	12,000 V, 1,700 A
	Total	722,170	137,550	159,850	219,700	
AUSTRIA	OMV AG, Schwechat	220,000	16,300 FCC	23,000	26,000 HDT 24,000 HDS	46,000 V, 2,300 L, 5,850 A
	Total	220,000	16,300	23,000	50,000	
BAHAMAS	Bahamas Oil Refining Co., Freeport	500,000				
BAHRAIN	Bahrain Petroleum Co. Ltd., Awali	250,000	34,200 FCC	15,200	61,700 HDS	164,000 V, 1,300 P, 2,400 A

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
BANGLADESH	Eastern Refinery, Chittagong	50,450		1,620	2,410 HDS	
BARBADOS	Mobil Oil Barbados Ltd., Bridgetown	3,000				400 A
BELGIUM	SAB Albatros, Antwerp	60,000		10,700	14,300 HDS	
	Anglo-Belge des Petroles SA, Antwerpen-Kiel	4,900				
	Belgian Shell NV, Ghent	9,400				
	Esso Belgium NV, Antwerp	93,000	10,000 FCC	8,000	17,800 HDT 23,000 HDS	32,000 V, 20,500 A
	NV Societe Industrielle Belge des Petroles SA, Antwerp	321,400	54,800 FCC	28,400	55,800 HDT 53,900 HDS	117,200 V, 4,300 Alky, 1,560 P, 11,300 A
	Raffinerie Belge de Petroles, Antwerp	98,000		19,000	27,000 HDT 10,000 HDS	14,000 V, 9,200 A
	SA Chevron Belgium, Feluy	140,000		11,500	11,500 HDT 23,000 HDS	85,000 V, 9,000 A
	Texaco Belgium NV, Ghent	140,000		17,500	46,000 HDT	
	Total	866,700	64,800	95,100	282,300	
BOLIVIA	Yacimientos Petroliferos Fiscales Bolivianos:					
	Camiri	1,500				
	Cochahamba	16,500				500 L
	Sanandita	500				
	Santa Cruz	3,000				
	Sucre	4,000				
	Total	25,500				
BRAZIL	Petróleo Brasileiro SA:					
	Betim, Minas Gerais	60,500	13,000 FCC			29,000 V, 2,200 A
	Canoas, Rio Grande do Sul	60,500	13,000 FCC			29,000 V, 1,400 A
	Capuava, Sao Paulo	33,000	14,000 TCC			15,000 V
	Cubatao, Sao Paulo	175,000	45,000 FCC	10,500		95,000 V, 600 C, 3,600 A
	Duque de Caxias, Rio de Janeiro	197,000	35,000 FCC	10,500		82,000 V, 4,500 L, 2,200 A
	Mataripe, Bahia	77,000	22,000 FCC			41,000 V, 2,900 L, 1,400 A
	Paulina, Sao Paulo	330,000	39,000 FCC			82,000 V, 4,000 A
	Paredao, Manaus	10,000	2,000 FCC			3,000 V, 1,000 A
	Refinaria de Petróleo Ipiranga SA, Rio Grande	9,300				1,000 A
	Refinaria de Petróleos de Manguinhos SA, Rio de Janeiro	9,500				
	Total	961,800	183,000	21,000		
BRUNEI	Sarawak Shell Berhad, Lutong	60,000				
BURMA	Myanma Oil Corp., Chauk	6,800				2,700 V, 50 (t/d) W
	Syriam	21,500	2,000 TCC			2,300 V, 700 L, 50 C
	Total	28,300	2,000			
CHILE	Empresa Nacional del Petróleo, Concepción	72,000	14,300 FCC	4,000		38,000 V
	Concón	50,000	12,000 FCC	6,000		24,000 V, 1,100 Alky, 1,200 A
	Magallanes	1,500				
	Total	123,500	26,300	10,000		
CHINA (TAIWAN)	Chinese Petroleum Corp., Kaohsiung	244,100	9,040 TCC	20,800	22,600 HDT 22,600 HDS	3,160 V, 810 Alky, 4,100A
	Total	244,100	9,040	20,800	45,200	
COLOMBIA	Colombian Petroleum Co., Tibú, North Santander	3,000				
	Empresa Colombiana de Petróleos, Barrancabermeja	110,000	35,000 FCC	2,000		55,000 V, 2,500 Alky, 3,300 L, 1,300 W, 3,500 A, 30,000 V, 3,500 P
	Cartagena	50,000	13,500 FCC			
	International Petroleum (Colombia) Ltd., La Dorada	5,600				

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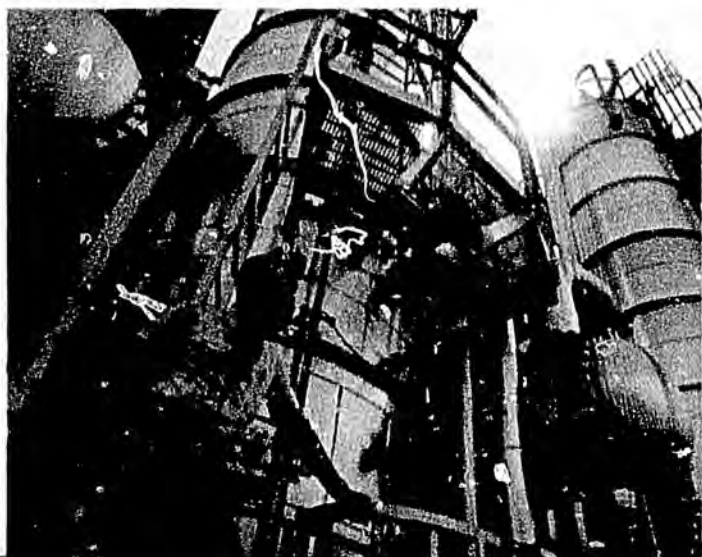
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The Fisher control system gives the operators better control over their process and lets them run the computer, not vice-versa. The reflux rate has been reduced so that less process steam is needed. That alone saves two railroad cars of coal a month. And this saving pays for the system in one year.

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WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro-processing	Other processing
	Texas Petroleum Co., El Guamo	2,500				
	Orito (with Petrolera del Rio)	1,000				
	Total	172,100	48,500	2,000		
COSTA RICA	Refinadora Costarricense de Petróleo, Moín, Limón	11,000		1,500	3,500 HDT	500 V, 300 A
CUBA	Instituto Cubano del Petróleo:					
	Cabaiguán	4,900				
	Havana	75,000	14,570 FCC	8,100	12,600 HDS	22,140 V, 2,675 P, 6,000 A
	Santiago de Cuba	42,000		3,600	6,000 HDS	
	Total	121,970	14,570	11,700	18,600	
CYPRUS	Cyprus Petroleum Refinery Ltd., Larnaca	15,000		2,740	6,000 HDT	1,070 V, 500 A
DENMARK	A/S Dansk Shell, Fredericia	59,000		12,000	14,000 HDT 8,000 HDS	
	Dansk Esso A/S, Kalundborg	71,000		7,600	10,000 HDS	25,000 V, 9,000 A
	Gulf Oil Refining A/S, Skaelskor	90,000		17,100	50,600 HDS	14,950 V
	Total	220,000		36,700	82,600	
DOMINICAN REPUBLIC	Falconbridge Dominicana C por A, Bonao	15,500			7,000 HDS	
	Refinería Dominicana de Petróleo SA, Nigua	30,000		7,000	12,000 HDT	
	Total	45,500		7,000	19,000	
ECUADOR	Anglo-Ecuadorian Oilfields Ltd., La Libertad	30,400				
	Corporación Estatal Petrolera Ecuatoriana, La Libertad	5,000				
	Petróleos Gulf del Ecuador CA, La Libertad	8,000				
	Texaco Petroleum Co., Lago Agrio	950				
	Total	44,350				
EGYPT	Refineries:					
	El Amiriya	26,000				
	Mex	120,000				
	Tanta	14,600				
	Others	19,400				
	Total	180,000				
EL SALVADOR	Refinería Petrolera Acajulla SA, Acajulla	14,000		2,600	9,500 HDT	725 A
ETHIOPIA	Ethiopian Petroleum S.C., Assab	14,430		1,890	2,330 HDT	3,020 V, 697 A
FINLAND	Neste Oy, Naantali	56,000	11,000 TCC	6,800	7,700 HDT 7,400 HDS	15,000 V, 2,700 P, 5,900 A
	Porvoo	140,000	21,900 FCC	19,000	31,000 HDT 37,000 HDS 14,000 OHC	60,000 V, 7,500 P, 6,700 A
	Total	196,030	32,900	25,800	97,100	
FRANCE	Antar Petroles de l'Atlantique, Donges	143,000	11,200 TCC	28,700	43,000 HDS	6,800 V
	Valenciennes	62,000		13,000	12,600 HDS	
	Vern-sur-Seiche	26,000		7,400		
	Compagnie Française de Raffinage, Gonfreville l'Orcher	484,000	24,300 FCC	64,380	71,600 HDT 85,000 HDS	56,000 V, 2,800 P, 7,400 L, 20,250 A
	La Mede	212,000	27,400 FCC	41,000	820 HDT 53,000 HDS	40,500 V, 820 P, 16,200 A
	Mardyck, Dunkerque	125,000		22,000	37,000 HDT 17,300 HDS	
	Compagnie Rhenane de Raffinage, Reichstett-Vendenheim	75,000		13,000	24,000 HDT 16,000 HDS	
	Elf Union:					
	Raffinerie de l'île de France, Mornant	75,000		15,000	23,000 HDT 8,000 HDS	29,000 V
	Raffinerie du Vexin, Gargenville	136,000				
	Raffinerie ELF, Feyzin	178,000	19,000 FCC	9,200	9,200 HDT	39,600 V
	Raffinerie ELF, Union Industrielle des Petroles, Ambes	43,000	8,700 FCC	4,600	4,600 HDT	22,000 V, 450 P

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	ESAF, Ambes	60,000		8,000		30,000 V, 2,400 A
	Fos sur Mer	170,000	14,300 FCC	25,700	85,000 HDT 24,300 HDS	19,500 V, 2,000 A
	Port Jerome	150,000	12,000 FCC	27,000	46,500 HDT 35,000 HDS	42,000 V, 5,600 L, 6,000 A
	Mobil Oil Francaise, Frontignan	120,000	11,000 TCC	20,000	26,000 HDT 18,000 HDS	11,000 V, 1,000 A
	Notre Dame de Gravenchon	72,500		17,000	21,000 HDT 7,000 HDS	10,500 V, 4,000 L, 1,500 A
	Raffinerie de Strasbourg, Herrlisheim-Drusenheim	95,000		22,000	22,000 HDT 13,500 HDS	16,600 V, 6,000 A
	Shell Francaise, Berre l'Etang	285,000	17,000 FCC	24,000	70,000 HDT 13,000 HDS	
	Pauillac	90,000	24,000 FCC	15,000	32,000 HDT 13,000 HDS	
	Petit Couronne	200,000	21,000	16,000	31,000 HDT 14,000 HDS	
	Societe Francaise des Petroles, BP, Dunkirk	118,750		13,500		17,100 V, 4,200 L, 3,600 A
	Lavera	243,200		7,200	13,500 RHC 13,230 HDT 13,500 HDS	40,150 V, 2,740 A
	Vernon	73,150		11,250	18,000 HDT 10,800 HDS	5,850 V, 2,000 A
	Societe de la Raffinerie de Lorraine (CFR 51%, Esso 40%, Elf Union 9%), Hauconcourt	105,000		15,000	35,000 HDT 11,500 HDS	16,000 V, 9,100 A
	Total	3,341,600	189,900	439,930	991,450	
GABON	Societe Gabonaise de Raffinage, Port Gentil	17,000		2,000	4,000 HDT	
GERMANY, WEST	Caltex Deutschland GmbH, Raunheim	90,000		3,500	8,600 DHC 6,500 HDT	28,000 V
	Deutsche BP AG, Dinslaken	203,300	11,150 FCC	12,600	9,000 HDS	21,600 V, 5,600 A
	Finkenwerder, Hamburg	103,900		7,650	8,550 HDS	46,450 V, 2,400 A
	Vohburg	104,500	10,800 FCC	16,200	25,200 HDT 13,300 HDS	21,600 V, 6,400 A
	Deutsche Marathon Petroleum GmbH, Burghausen, Bavaria	70,000			10,000 HDT	550 C
	Deutsche Shell AG, Godorf	165,000		24,000	68,000 HDT 49,000 HDS	
	Harburg-Grasbrook	85,000	12,000	9,000	16,000 HDT 12,000 HDS	
	Ingolstadt	55,000		8,000	17,000 HDT 17,000 HDS	
	Monheim	7,000				
	Deutsche Texaco AG, Heide	105,000	8,000 TCC	14,000	14,000 HDT 26,000 HDS	35,000 V, 300 P, 3,500 A
	Erdol Raffinerie Duisburg GmbH, Duisburg	37,800		7,300	7,300 HDT 4,200 HDS	
	Erdolraffinerie Ingolstadt AG, Ingolstadt-Donau	130,000		29,500	42,000 HDT 6,500 HDS	
	Erdol-Raffinerie Neustadt GmbH, Neustadt-Donau	144,000	11,700 FCC	17,700	26,500 HDT 21,000 HDS	24,000 V
	Erdoel-Raffinerie Speyer, Speyer	57,800				
	Erdolwerke Frisia AG, Emden	47,500		9,500	15,600 HDS	
	Esso AG, Hamburg	110,000	8,000 FCC	14,000	33,000 HDT 22,000 HDS	15,000 V, 2,300 L, 9,000 A
	Ingolstadt	100,000	15,000 FCC	13,500	31,500 HDT 34,000 HDS	26,000 V, 7,500 A
	Karlsruhe	180,000		30,000	54,000 HDT 58,000 HDS	45,000 V, 10,000 A
	Koln	115,000		9,000	10,000 HDT 12,000 HDS	17,000 V, 8,000 A
	Gelsenberg AG, Gelsenkirchen- Horst	144,000	11,900 TCC	30,700	16,300 HDT 31,400 HDS	16,100 V, 370 L
	Gewerkschaft Erdol-Raffinerie Deurag, Nerag, Misburg	54,000		8,000	7,000 HDS	
	Mobil Oil AG, Bremen	30,000	7,500 TCC	5,500	5,500 HDT 6,000 HDS	7,000 V, 800 L, 1,200 A
	Woerth	75,000	12,000 FCC	14,000	28,000 HDT 19,000 HDS	23,000 V, 5,000 A
	Oberrheinische Mineralolwerke GmbH, Karlsruhe	128,000		20,500	20,500 HDT 18,100 HDS	21,000 V, 11,800 A

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Occidental Oel GmbH, Bruns- buttel	7,500				6,700 A
	Essen	20,000				10,000 V, 7,500 A
	Oelwerke Julius Schindler GmbH, Hamburg	7,950				5,400 V, 5,000 L
	Saarland-Raffinerie GmbH, Klarenthal-Saar	55,243				
	Union Rheinische Braunkohlen Kraftstoff AG, Wesseling	125,000		8,400	15,000 HDT 10,000 HDS	650 P
	Veba-Chemie AG, Gelsenkirchen- Buer	215,700	4,900 FCC	22,800	31,300 HDT 10,900 HDS	6,300 V, 3,800 A
	Wintershall AG, Lingen, Emsland	95,000	13,600 FCC	15,600	17,600 HDT 12,000 HDS	31,800 V, 800 P, 3,060 C, 4,000 A
	Mannheim	113,530		12,570	3,040 HDS	
	Salzbergen	5,000			800 HDT	5,000 V, 2,000 L, 1,400 A
	Total	2,986,723	126,550	363,520	930,190	
GHANA	Ghananian-Italian Petroleum Co., Tema	28,000		6,500	6,500 HDT	
GREECE	Hellenic Aspropyrgos Refinery SA, Aspropyrgos	98,000		15,000	23,000 HDT 16,000 HDS	5,000 V, 2,000 A
	Motor Oil (Hellas) Corinth Refineries SA, Agii Theodori Corinth	140,000			25,800 HDS	12,000 V, 2,500 L, 2,800 A
	Petrola Hellas SA, Eleusis Thessaloniki Refining Co. AE, Thessaloniki	100,000				2,500 V, 1,300 A
		73,000		7,000	12,400 HDT 11,700 HDS	6,800 V
	Total	411,000		22,000	88,900	
GUAM	Guam Oil & Refining Co., Apra Heights	29,500				
GUATEMALA	Refinería Petrolera de Guatemala- California Inc., Puerto Barrios	10,800		2,500	1,900 HDT 1,400 HDS	
	Texas Petroleum Co., Escuintla	14,000		3,000	5,000 HDT	
	Total	24,800		5,500	8,300	
HONDURAS	Refinería Texaco de Honduras SA, Puerto Cortes	14,000		1,800	5,000 HDT	
HUNGARY	Szazhalmatta (south of Budapest)	46,497				
INDIA	Assam Oil Co. Ltd., Digboi	12,100				893 L, 32 C, 425 A
	Burmah Shell Refineries Ltd., Trombay, Bombay	111,000	17,000 FCC	7,000		33,000 V, 10,000 A
	Caltex Oil Refining (India) Ltd., Visakhapatnam	32,000	9,100 FCC			15,200 V, 2,000 A
	Cochin Refineries Ltd., Cochin	66,000		6,000	32,250 HDS	8,975 V, 3,442 A
	Hindustan Petroleum Corp. Ltd., Trombay, Bombay	70,000	6,000 FCC			19,440 V, 3,400 L, 6,500 A
	Indian Oil Corp Ltd., Barauni	60,000				15,000 V, 910 L, 270 C
	Baroda	82,000		7,000		
	Gauhati	16,000				125 C
	Haldia	50,000		4,500	4,500 HDT 13,000 HDS	
	Madras Refineries Ltd. Manali	56,000		2,158	4,700 HDT 24,962 HDS	22,300 V, 4,600 L, 4,270 A
	Total	555,100	32,100	26,658	79,412	
INDONESIA	Lemigas, Cepu, Central Java	4,000				
	Pertamina: Balikpapan, Kalimantan	75,000				13,000 V
	Dumai, Central Sumatra	100,000		7,000		
	Pangkalan Brandan, North Sumatra	4,500				200 L, 300 A
	Plaju, South Sumatra	111,200		16,000		24,000 V, 1,100 A/ky, 173 P, 1,200 A
	Sungei Gerong, South Sumatra	79,000	19,500 FCC			87,000 V, 650 A/ky, 1,200 P
	Sungei Pakning South, Central Sumatra	50,000				

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Sungei Pakning South, Central Sumatra	50,000	.....	.....	.....	.....
	Wonokromo, East Java	4,000	.....	.....	.....	1,500 A
	Total	427,700	19,500	23,000	.....	.....
IRAN	National Iranian Oil Co.: Abadan	470,000	36,000 FCC	23,500	25,000 HDT	96,000 V, 9,300 Alky, 1,400 L, 10,500 A
	Kermanshah	15,000	.....	2,750	2,750 HDT 3,100 HDS	.....
	Masjid Sulaiman	64,000	.....	.....	19,000 DHC	.....
	Shiraz	40,000	.....	6,215	5,225 HDT 3,120 HDS 9,280 DHC	18,400 V, 1,000 A
	Tehran	200,000	.....	28,200	30,000 DHC	96,000 V, 2,100 L, 7,300 A
	Total	789,000	36,000	60,665	97,475	.....
IRAQ	Oil Refineries Administration: Basra	70,000	.....	.....	.....	.....
	Daura	71,000	.....	5,000 C	13,000 HDT	8,160 L, 1,815 A
	K3-Haditha	7,000	.....	.....	.....	.....
	Khanaqin	12,000	.....	.....	.....	.....
	Muthia	4,500	.....	.....	.....	.....
	Qaiyarah, Mosul	2,000	.....	.....	.....	970 A
	Iraqi Company for Oil Operations, Kirkuk	2,000	.....	.....	.....	.....
	Total	168,500	.....	5,000	13,000	.....
IRELAND	Irish Refining Co. Ltd., Whitegate	56,000	.....	13,200	.....	.....
ISRAEL	Oil Refineries Ltd., Ashdod	66,000	.....	10,000	11,000 HDT 25,000 HDS	36,000 V
	Haifa	135,000	.....	14,500	15,500 HDT 25,000 HDS	28,000 V, 800 L, 3,600 A
	Total	201,000	.....	24,500	76,500	.....
ITALY	Amoco Italia, Cremona	100,000	.....	10,000	15,600 HDT 7,100 HDS	12 A
	ANIC SpA, Gela	90,000	21,000 FCC	12,000	16,000 HDT 25,000 HDS	30,000 V, 9,500 A 3,000 C
	Anonima Petroli Italiana, Falconara Marittima	81,000	.....	10,000	10,500 HDT 12,000 HDS	13,000 V, 3,000 A
	ERG—Raffineria Edoardo Garrone, Genoa, San Quirico	147,000	.....	14,270	21,400 HDS	.....
	Esso Italiana, Augusta, Siracusa	210,000	40,000 FCC	15,300	23,500 HDT 25,000 HDS	189,200 V, 7,700 Alky, 5,200 L, 6,700 A
	Gaeta Industrie Petroli SpA, Gaeta	39,900	27,000 FCC	11,250	10,800 HDT	225 L
	Gulf Italiana SpA, Bertinico	80,000	.....	12,350	29,450 HDS	4,370 A
	Industrie Chimiche Italiane del Petrolio SpA (Icip), Mantova-Frassino	65,000	.....	9,700	14,600 HDT 5,000 FCC	7,500 V, 5,000 A
	Industria Italiana Petroli SpA, La Spezia	103,000	.....	21,100	24,600 HDT 13,000 HDS	10,300 V, 3,100 A
	Rho	80,000	12,300 TCC	16,300	21,100 HDT 13,400 HDS	29,000 V, 1,720 Alky, 1,560 L, 4,650 A
	Taranto	88,000	.....	16,700	23,500 HDT 13,000 HDS	13,300 V, 1,900 A
	Industria Leganti Stradali del Affini (Ilsea), Como	7,885	.....	1,350	.....	.....
	Industria Raffinazione Olii Minerali (Irom), Porto Marghera	110,000	.....	18,000	18,000 HDT 18,500 HDS	.....
	Iplom—Raffineria Petroli SpA, Sarissola	31,200	.....	.....	.....	5,700 V, 2,850 A
	Liquichimica SpA, Milan	12,000	.....	1,000	.....	.....
	Lombarda Petroli, Villasanta	23,500	.....	3,600	4,800 HDT	.....
	Mediocranea SpA, Milazzo, Sicily	505,000	45,000 FCC	10,000	10,000 HDT 20,000 HDS	80,000 V, 5,000 Alky
	Mobil Oil Italiana SpA, Naples	130,000	14,000 TCC	12,500	12,500 HDT 13,500 HDS	7,500 V, 3,500 Alky, 750 L, 650 A

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Montedison, Brindisi	30,000				
	Priolo	300,000	25,000 FCC	9,500	9,500 HDT 17,000 HDS	40,000 V
	Raffineria Dellepiane SpA, San Quirico, Genoa	20,000				12,200 A
	Raffineria del Po SpA, Sannazzaro d'Burgondi	122,000	22,000 FCC	24,000	24,000 HDT 12,000 HDS	50,000 V, 3,600 Alky
	Raffineria di Roma SpA, Rome	80,300		12,300	18,900 HDT 8,500 HDS	9,300 V, 3,100 A
	Raffineria Olii Lubrificanti (ROL), Viguzzola	1,425				
	Sanquirico SpA, Genova San Quirico	32,500		1,500	11,500 HDS	
	Saras—Raffinerie Sarde, Sarroch, Cagliari	360,000	50,000 FCC	30,000	30,000 HDT 60,000 HDS	5,000 Alky
	Sarom Raffinazione SpA, Ravenna	332,000		14,000	14,000 HDT	
	Sarpom, Novara	235,000	12,200 FCC	27,200	107,300 HDT	22,800 V, 2,800 A
	Societa Italiana Resine SpA, (SIR), Porto Torres, Sar- dinia	118,750		11,700	14,400 HDS	
	Societa Petrolifera Italiana, Arcola, La Spezia	18,400				
	Stanic SpA, Bari	90,000		10,000	10,000 HDT 18,000 HDS	17,000 V
	Leghorn, Livorno	125,000		24,000	24,000 HDT 16,000 HDS	20,000 V, 7,000 L
	Total Italiana—Aquila, Trieste	111,000		17,000	23,500 HDT 15,000 HDS	11,000 V, 1,200 L, 4,700 A
	Volpiano Refinery, Volpiano	72,800		10,750	18,200 HDT 10,920 HDS	
	Total	3,952,660	268,500	387,300	884,570	

IVORY COAST

Societe Ivoirienne de Raffinage, Abidjan	42,940		4,420	6,465 HDT 3,345 HDS	
Total	42,940		4,420	9,810	

JAMAICA

Esso West Indies Ltd., Kingston	32,600		3,000	18,900 HDS	1,500 V, 670 A
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JAPAN

Asia Kyoseki Co. Ltd., Sakaide, Kagawa	100,000	9,000 FCC		12,600 HDT 13,500 HDS	36,000 V
Asia Oil Co., Hakodate	23,750		1,170	2,700 HDT	
Yokohama	95,000		12,600	11,700 HDT 6,300 DHC	
Daikyo Co. Ltd., Yokkaichi-City, Mie	195,000	23,500 FCC	9,000	6,500 HDT 77,000 HDS	83,500 V, 4,200 L, 7,878 A
Fuji Kosan Co. Ltd., Kainan	77,600			9,000 HDT 20,000 HDS	44,000 V, 13,600 L, 17,500 A
Fuji Oil Co. Ltd., Sodegaura, Chiba	189,000	4,500 FCC	13,500	26,900 HDT 44,500 HDS	34,200 V
General Sekiyu Seisei KK, Kawasaki	52,300		5,700	16,150 HDT	
Sakai	114,000		23,800	72,200 HDT 29,450 HDS	50,400 V
Idemitsu Kosan Ltd., Chiba	310,000	34,000 FCC	35,000	43,000 HDT 108,000 HDS	60,000 V, 10,500 L
Hokkaido	70,000		11,000	13,000 HDT 17,000 HDS	
Hyogo	110,000		15,000	22,000 HDT 65,000 HDS	
Tokuyama	140,000	15,000 FCC	15,000	15,000 HDT 30,000 HDS	20,000 V, 976 A
Kansai Oil Co. Inc., Sakai City	110,000		5,000	20,000 HDT 20,000 HDS	34,000 V
Kashima Oil Co., Kashima	162,000	12,600 FCC	5,400	92,700 HDS	60,300 V
Koa Oil Co. Ltd., Marifu	141,550	12,600 FCC	9,900	12,600 HDT 9,000 HDS	45,000 V, 225 C, 270 A
Osaka	76,000	14,400 FCC	8,100	2,250 DHC 6,300 HDT 10,800 HDS	49,500 V
Kyokuto Petroleum Industries Ltd., Chiba	97,000		7,700	8,000 HDT 6,700 HDS	67,000 V, 1,700 A
Kyushu Oil Co. Ltd., Oita	170,000	9,000 FCC	9,000	67,000 HDS	91,000 V

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Maruzen Oil Co. Ltd., Chiba	195,000	20,000 FCC	25,000	57,000 HDT 35,000 HDS	65,000 V, 10,000 A
	Matsuyama Shimotsu	50,000 37,500	6,500 FCC	3,500 7,000	19,000 HDT 7,000 HDT	14,460 V, 1,500 L, 4,000 A
	Mitsubishi Oil Co., Kawasaki	105,000		12,000	10,000 HDT 12,500 HDS	5,800 V, 18,000 A
	Mizushima	220,000	20,000 FCC	33,700	48,600 HDT 73,000 HDS 45,000 RHD	97,000 V, 2,000 P, 2,770 L, 29,700 A
	Nichimo Sekiyu Seisei KK, Kawasaki	96,000		10,400	7,200 HDT 40,500 HDS	19,800 V
	Nihonkai Oil Co. Ltd., Toyama City	60,000				
	Nippon Mining Co. Ltd., Funakawa	13,370				1,830 V, 840 L, 700 A
	Mizushima	222,310	18,360 FCC	21,740	2,840 DHC 4,520 HDT 64,560 HDS 27,190 RHD	32,550 V, 3,450 L, 5,810 A
	Nippon Oil Co. Ltd., Niigata	26,000		5,100	18,500 HDT	2,000 V, 1,000 L, 425 A
	Nippon Petroleum Refining Co. Ltd., Kudamatsu	42,000		5,200	8,100 HDT	4,500 V, 1,610 A
	Muroran	110,000	10,000 FCC	18,000	66,700 HDT 40,000 HDS	50,000 V
	Negishi	330,000	20,000 FCC	31,000	97,900 HDT 68,000 HDS	143,000 V
	Yokohama	70,000	5,600 FCC	3,300	10,600 HDT	25,000 V, 1,050 A
	Seibu Seikyu KK, Onoda	100,000		8,000	37,000 HDT 9,000 HDS	
	Showa Sekiyu KK, Kawasaki	137,000		20,000	30,000 HDT 42,000 HDS	
	Niigata	37,000		4,000	11,000 HDT 2,000 HDS	
	Showa Yokkaichi Sekiyu KK, Yokkaichi	240,000	15,000	32,000	75,000 HDT 85,000 HDS	
	Taiyo Oil Co. Ltd., Kikuma	56,050		4,500		3,600 V
	Teiseki Topping Plant Co., Kubiki	4,410				
	Tao Nenryo Kogyo KK, Kawasaki	190,000	36,000 FCC	14,400	137,700 HDS	110,700 V, 1,340 A
	Shimizu	41,300		4,140	13,140 HDS	3,420 V, 255 L, 980 A
	Wakayama	177,700	20,970 FCC	32,400	3,900 HDT 104,400 HDS	71,550 V, 1,130 Alky, 5,410 L, 2,260 A
	Toa Oil Co. Ltd., Chita	100,000		22,000	89,000 HDT 37,000 HDS	46,000 V
	Kawasaki	100,000		11,000	33,000 HDT	
	Toho Oil Co. Ltd., Yanohama, Owase City	40,000				
	Tohoku Oil Co., Sendai City	100,000		13,000	69,000 HDS	60,000 V, 5,000 A
	Total	5,133,840	307,030	527,550	2,458,700	
JORDAN	Jordan Petroleum Refinery Co. Ltd., Zerqa	21,223	4,403 FCC			6,631 V, 615 A
KENYA	East African Oil Refineries Ltd., Mombasa	48,000		4,000	16,000 HDT	
KHMER REPUBLIC	Societe Khmere de Raffinage de Petrole, Krung Kompong Som	12,540		1,800	5,850 HDT	
KOREA	Honam Oil Refinery Co. Ltd., Yosu	160,000		7,100	11,400 HDT	2,100 A
	Korea Oil Corp., Ulsan	210,000		17,000	23,000 HDT 4,000 HDS	3,600 V, 2,100 A
	Kyung In Energy Co. Ltd., Inchon	55,000		3,600	7,000 HDT	
	Total	425,000		27,700	45,400	
KUWAIT	American Independent Oil Co., Mena Abdullah	132,000			32,000 HDS	112,000 V
	Arabian Oil Ltd. (Japan), Ras Al Khafji	30,000				

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro-processing	Other processing
	Getty Oil Co., Mina Saud	50,000				5,000 C
	Kuwait National Petroleum Co., Shuaiba	134,000		14,000	20,700 DHC 48,600 RHC 85,500 HDT 10,500 HDS	67,000 V
	Kuwait Oil Co. Ltd., Mina al Ahmadi	300,000		5,600		1,250 A
	Total	646,000		19,600	197,300	
LEBANON	Iraq Petroleum Co. Ltd., Tripoli	36,000	7,250 FCC	4,400	6,730 HDT	12,730 V, 900 A
	Mediterranean Refining Co., Sidon	17,500		2,900	2,900 HDT	
	Total	53,500	7,250	7,300	9,630	
LIBERIA	Liberia Refining Co., Monrovia	11,000		2,000	1,000 HDT	500 A
LIBYA	American Overseas Petroleum Ltd., Nafoora	1,800				
	Esso Standard Libya, Marsa El-Brega	8,000		1,500	3,900 HDT	
	Mobil Oil Corp., Amal	1,800				
	National Oil Co., Intisar	1,800				
	Zavia	60,000		6,500	17,720 HDS	
	Zeutina	3,000				300 A
	Total	76,400		8,000	21,620	
MALAGASY	Societe Malagache de Raffinage, Tamatave	15,000		2,200	5,000 HDT	
MALAYSIA	Esso Malaysia Berhad, Port Dickson	22,200		3,700	7,800 HDT 6,400 HDS	2,800 V, 1,100 A
	Shell Refining Co., Berhad, Port Dickson	31,000		2,000	8,000 HDT 4,000 HDS	
	Total	63,200		5,700	26,200	
MARTINIQUE	Societe Anonyme Raffinerie des Antilles, Fort de France	10,400		2,500	3,500 HDT 3,300 HDS	
	Total	10,400		2,500	6,800	
MEXICO	Petr6leos Mexicanos: Arcapatzalco	100,000	23,000 FCC		26,000 HDS	50,000 V, 3,000 Alky, 650 P
	Cuidad Madero	169,000	23,000 FCC	15,000	18,000 HDT 15,000 HDS	50,000 V, 3,000 Alky, 650 P, 400 C, 15,000 A
	Minatitlán	233,500	24,000 FCC 21,000 TCC	12,000	21,000 HDT 29,000 HDS 5,000 HDT	32,000 V, 600 P, 3,000 L
	Poza Rica	27,000				
	Reynosa	20,500				
	Salamanca	210,000	18,000 TCC	8,300	18,500 RHC 8,300 HDT 28,000 HDS	51,200 V, 7,100 L, 3,000 A
	Total	760,000	109,000	35,300	168,800	
MOROCCO	Societe Cherifienne des Petroles, Sidi-Kacem	8,550	3,600 TCC	1,080	1,080 HDT	
	Societe Am. Marocaine Italienne de Raffinage (Samir), Mohammedia	50,000		6,500	6,500 HDT 2,200 HDS	
	Total	58,550	3,660	7,580	9,780	
MOZAMBIQUE	Sociedade Nacional de Refinacao de Petr6leos, Salazar	17,000		2,500	2,500 HDT	5,000 V, 1,000 A
NETHERLANDS	BP Raffinaderij Nederland NV, Rotterdam	490,200		19,800	158,400 HDT 18,000 HDS	
	Chevron Petroleum Maatschappij, Pernis	300,000		39,000	39,000 HDT 38,000 HDT	25,000 V, 5,000 A
	Esso Nederland BV, Rotterdam	325,000		48,000	80,000 HDT 62,000 HDS	

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Gulf Oil Raffinaderij NV, Rozenburg	94,000		3,000	29,500 HDS	31,000 V, 3,300 L, 2,100 A
	Mobil Oil BV, Amsterdam	125,000		24,000	36,000 HDT 29,000 HDS	
	NV Smid & Hollander, Amsterdam	6,500			4,500 A	
	Shell Nederland Raffinaderij NV, Pernis	500,000	75,000 FCC	26,000	130,000 HDT 55,000 HDS	
	Total	1,840,700	75,000	164,800	674,900	
NETHERLANDS ANTILLES	Lago Oil & Transport Co. Ltd., Aruba	440,000			123,000 HDT 115,000 HDS	230,000 V, 1,000 Alky
	Shell Curacao NV, Emmastad	460,000	35,000 FCC	15,000	100,000 HDT 25,000 HDS	
	Total	900,000	35,000	15,000	363,000	
NEW ZEALAND	New Zealand Refining Co. Ltd., Marsden Point, Whangarei	54,000		18,000	32,000 DHT 5,000 DHD	
	Total	54,000		18,000	37,000	
NICARAGUA	Esso Standard Oil SA Ltd., Managua	13,200		2,600	10,600 HDS	1,900 V, 732 A
NIGERIA	Nigerian Petroleum Refining Co. Ltd., Alesa-Elene, Port Harcourt	60,000		6,500		
NORWAY	A/S Norske Esso, Slagen, Tonsberg	110,000		8,500	18,000 HDT 8,100 HDS	
	Valloy, Tonsberg	3,000			700 HDT	2,100 V, 700 L, 1,300 A
	A/S Norske Shell, Sola	55,000		10,000	14,000 HDT 8,000 HDS	
	Total	168,000		18,500	48,800	
OKINAWA	Nansei Sekiyu, Nishihara Okinawa Sekiyu Seisei Co. Ltd., Heianza Island	93,000		10,000	36,300 HDT	
	Toyo Petroleum Refining Co. Ltd., Nakagusuku	94,000			69,200 HDS	
	Total	212,000		12,000	107,500	
PAKISTAN	Attock Oil Co. Ltd., Rawalpindi	11,640				1,200 V, 350 L, 13,000 A
	National Refinery Ltd., Korangi	12,570			1,635 HDT	5,650 V, 1,635 L, 1,800 A
	Pakistan Refinery Ltd., Karachi	55,000		2,500	21,000 HDT	
	Total	79,210		2,500	22,635	
PANAMA	Refinería Panamá SA, Las Minas, Colon	100,000		7,500	30,000 HDT	14,000 V, 5,000 A
PARAGUAY	Refinería Paraguaya SA, Villa Elisa	5,000				210 A
PERU	Petróleos del Perú, Conchán	8,500				3,500 V, 1,000 A
	Iquitos	1,400				
	La Pampilla	37,000	9,360 FCC	1,760	2,700 HDT	
	Pucallpa	2,700				
	Talara	80,000	16,600 FCC			20,000 V, 1,000 L, 2,000 A
	Total	129,600	25,960	1,760	2,700	
PHILIPPINES	Bataan Refining Corp., Limay	108,000	13,200 TCC	15,300	47,100 HDT 16,400 HDS	17,500 V, 4,300 A
	Caltex (Philippines) Inc., Batangas	70,000	11,400 FCC	8,600	15,200 HDT 15,200 HDS	18,100 V, 900 P
	Filoil Refinery Corp., Rosario	28,000		3,060	7,060 HDS	8,500 V, 773 A

	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro-processing	Other processing
	Shell Philippines Inc., Batangas	68,000		8,000	12,000 DHT 6,000 HDS	
	Total	274,000	24,600	34,960	118,960	
POLAND	Glinik Mariampolski	2,470				
	Jasto	2,660				
	Jealicze	3,880				
	L. Warvnski, Czechowice	13,300				
	Mazovia, Plock	114,000	13,500	10,800	16,200 HDS	54,000 V, 9,000 C, 2,520 L, 5,400 A
	Trzebinia	9,500				
	Total	145,810	13,500	10,800	16,200	
PORTUGAL	Sacor, Boa Nova, Porto	70,000		15,600	25,800 HDT 9,400 HDS	10,000 V, 2,000 L, 700 A
	Cabo Ruivo, Lisbon	40,000	12,000 TCC		5,500 HDS	320 A
	Total	110,000	12,000	15,600	40,700	
PUERTO RICO	Caribbean Gulf Refining Corp., Bayamón	37,800	7,800 FCC	5,500	16,100 HDS	14,200 V, 400 P, 1,000 A
	Commonwealth Oil Refining Co. Inc., Peñuelas	161,000	40,000 HF	70,000	88,000 HDS	65,000 V, 6,000 Alky, 2,400 P
	Yabucoa Sun Oil Co., Yabucoa	85,000			12,000 HDT 8,300 HDS	35,000 V, 5,400 L
	Total	283,800	47,800	75,500	124,400	
QATAR	National Oil Distribution Co., Umm Said	6,800		1,300	2,200 HDT 700 HDS	
	Total	6,800		1,300	2,900	
RHODESIA	Central African Petroleum Refineries (Pvt.) Ltd., Umtali	20,000	(Not in operation; not included in total)			
RUMANIA	Brazi	76,000			2,025 DHT	
	Pitesti	57,000			86,400 DHT	15,570 L
	Sulpacu Barcau (Crisana oil field)	5,700				
Total crude capacity for all refineries: 320,000 b/cd. Other refineries at Borzetsi, Brazov, Cimpina, Darmanesti, G. Gheorghiu Dej—Onesti, Ploiesti, Telaejen.						
SAUDI ARABIA	Arabian American Oil Co., Ras Tanura	565,000		12,500	22,800 HDS	100,000 V, 4,300 A
	Jeddah Oil Refinery Co., Jeddah	31,120	8,210 FCC	2,640	9,900 HDS	12,590 V, 1,500 A
	Riyadh Oil Refinery, Riyadh	14,180		5,350	5,970 DHC 2,280 HDT	5,670 V, 550 A
	Total	610,300	8,210	20,490	40,950	
SENEGAL	Societe Africaine de Raffinage, Dakar	15,000		1,320		
SIERRA LEONE	Sierra Leone Petroleum Refining Co. Ltd., Freetown	10,000				
SINGAPORE	BP Refinery Singapore Pte. Ltd., Pasir Panjang	25,650				
	Esso Singapore Private Ltd., Pulau Ayer Chawan	230,000		6,000	41,500 HDT	47,000 V, 5,000 L, 3,300 A
	Mobil Oil Malaya Sendirian Berhad, Jurong	175,000		4,000	4,000 HDT 32,000 HDS	
	Shell Eastern Petroleum Ltd., Pulau Bukom	350,000		10,000	90,000 HDT 20,000 HDS	
	Singapore Petroleum Co. Private Ltd., Pulau Merlimau	65,000			41,010 HDS	29,790 V, 1,000 A
	Total	845,650		20,000	228,510	
SOUTH AFRICA	Caltex Oil SA (Pty) Ltd., Cape Town	46,000	10,400 FCC		30,500 HDT	21,000 V, 950 A
	Mobil Oil Refining Co. Southern Africa Pty. Ltd., Durban	100,000	14,500 FCC	16,000	18,500 HDT 22,000 HDS	28,000 V, 300 P, 2,000 A

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
	Durban* National Petroleum Refiners of South Africa (Pty) Ltd., Sasolburg	63,000	15,500 FCC	10,700	9,800 DHC 8,100 RHC 14,500 HDT	3,000 L 22,400 V, 4,400 Alky, 2,900 A
	Satmar Ltd., Boksburg North Shell & BP South African Petroleum Refineries Pty. Ltd., Durban	3,100 185,000				1,200 V, 600 A
			17,000 FCC	30,000	36,000 HDT 55,000 HDS	
	Total	397,100	57,400	56,700	194,400	
*South African Oil Refining Co. is owner; Mobil is operator.						
SOUTH YEMEN	BP Refinery (Aden) Ltd., Little Aden	169,100		9,000	2,700 HDS	
SPAIN	Asfaltos Españoles SA (Asesa), Tarragona	18,000				15,000 V, 11,700 A
	Cia. Española de Petróleos (Cepsa), San Roque, Cádiz	160,000		27,000	27,000 HDT 9,000 DHC 8,000 HDS	
	Santa Cruz de Tenerife, Canary Islands	175,000		16,500	10,800 HDS	10,620 V
	Cia. Ibérica Refinadora de Petróleos SA (Petroiber), La Coruña	120,000		16,500	16,500 HDT 15,000 HDS	
	Empresa Nacional Calvo Sotelo, Puertollano	152,000		16,000	1,900 HDT 30,000 HDS	12,000 V, 3,800 L
	Esso Petróleos Españoles SA, Castellón de la Plana	80,000		7,600	14,000 HDT 28,000 HDS	
	Refinería de Petróleos de Escombreras SA, Cartagena, Murcia	220,000		18,000	20,000 HDT 53,000 HDS	20,400 V, 3,000 L
	Refinería de Petróleos del Norte SA (Petronor), Somorrostro, Bilbao	160,000		21,000	48,000 HDS	
	Union Explosivos Rio Tinto SA Huelva	80,000		14,100	24,900 HDT	23,200 V, 1,300 L, 6,900 A
	Total	1,165,000		136,700	306,100	
SRI LANKA	Ceylon Petroleum Corp., Sapugaskanda	34,400		3,400	13,800 HDT	1,700 V, 850 A 1,900 HDS
	Total	34,400		3,400	15,700	
SUDAN	Shell & BP Sudan Ltd., Port Sudan	22,000		2,000	9,000 HDT	
SWEDEN	AB Nynas-Petroleum, Gothenburg	5,700				4,500 V, 900 A
	Malmö	3,800				
	Nynasham	28,500		6,300		4,500 V
	BP Raffinaderi (Goteborg) AB, Gothenburg	110,000		21,000	44,000 HDT	
	Koppartrans Olje AB (Shell), Gothenburg	100,000		17,000	27,000 HDT 16,000 HDS	
	Total	248,000		47,300	87,000	
SWITZERLAND	Raffinerie de Cressier SA, Cressier	65,000		13,000	22,000 HDT 8,000 HDS	
	Raffinerie du Sud-Ouest SA, Collombey	73,000		10,600	17,300 HDT	
	Total	138,000		23,600	47,300	
SYRIA	Homs Petroleum Refining Co., Homs	49,690		2,620		3,110 V, 1,920 A
TANZANIA	Tanzanian and Italian Petroleum Refining (Tiper) Co. Ltd., Dar es Salaam	16,100		4,200	5,000 HDS	



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	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro-processing	Other processing
THAILAND	Defence Energy Department, Bangkok	65,000		10,000	18,000 HDS	400 A
	Fang refinery, Chiang Mai	1,200				1,000 V 200 L
	Esso Standard Thailand Ltd., Sriracha	35,000		4,900	17,000 HDT	5,700 V, 2,600 A
	Thai Oil Refinery Co. Ltd., Sriracha, Choburi	65,000	7,000 FCC	9,000	32,000 HDT 10,000 HDS	14,500 V, 1,400 A
	Total	166,200	7,000	23,900	77,000	
TRINIDAD	Texaco Trinidad Inc., Pointe-a-Pierre	361,000	26,500 FCC	20,000	45,000 HDT 80,000 HDS	187,000 V, 2,200 Alky, 350 P, 4,000 L
	Trinidad and Tobago Oil Co. Ltd., Point Fortin	100,000		7,000	22,000 HDT	7,000 V
	Total	461,000	26,500	27,000	147,000	
TUNISIA	Societe Tuniso Italienne de Raffinage (Stir), Zarzouna, Bizerte	25,000		3,300		
TURKEY	Anadolu Tasiyehanesi AS, Mersin	90,000		10,500	22,000 HDT 11,500 HDS	
	Istanbul Petrol Rafinerisi AS, Izmit	140,000	25,000 FCC	11,500	14,800 HDT 28,500 HDS	22,000 A
	Turkish Petroleum Co., Aliaga-Izmir	62,700		6,490	7,500 HDT	36,700 V, 3,050 L
	Batman	22,800	3,600 TCC	1,170		3,120 A
	Total	315,500	28,600	29,660	84,300	
UNITED KINGDOM	Berry Wiggins & Co. Ltd., Kingsnorth-on-the-Medway, Hoo, Kent	2,000				5,000 V
	BP Refinery (Kent), Isle of Grain	229,900	16,200 FCC 18,000	40,050	14,750 HDS	61,650 V, 2,790 Alky, 3,600 L
	Burmah-Castrol Co., Ellesmere Port	25,280		5,060	6,430 HDT 6,430 HDS	14,370 V, 6,150 L
	Conoco Ltd., South Killingholme, South Humberside	87,500		30,000	106,000 HDS	1,110 C
	Esso Petroleum Co. Ltd., Fawley, Hampshire	391,000	81,000 FCC	50,500	33,300 HDT 66,500 HDS	62,000 V, 7,900 P, 7,100 L, 8,300 A
	Lindsey Oil Refinery Ltd., Killingholme, Grimsby	189,000		27,400	39,600 HDT 30,500 HDS	14,200 V, 7,000 A
	Mobil Oil Co. Ltd., Coryton, Essex	175,000	9,500 TCC	33,000	42,000 HDT 33,000 HDS	43,000 V, 5,500 L, 1,700 A
	Phillips Imperial Petroleum Ltd., North Tees	100,000				
	Philmac Oils Ltd., Eastham, Cheshire	13,000				9,300 V, 7,300 A
	Shell U.K. Ltd., Heysham	39,000				
	Shell Haven	200,000		32,000	63,000 HDT 16,000 HDS	
	Stanlow	215,000	50,000	53,000	40,000 HDT 12,000 HDS	
	Teesport	125,000		15,000	31,000 HDT 14,000 HDS	
	Total England	1,791,680	174,700	286,010	554,510	
	North Ireland					
	BP Refinery (Northern Ireland) Ltd., Belfast	32,300		5,850	10,150 HDT 3,350 HDS	
	Total Ireland	32,300		5,850	13,500	
	Scotland					
	BP Refinery (Grangemouth), Ltd., Grangemouth	186,200	16,200 FCC	21,600	27,000 RHC 54,000 HDT	76,500 V
	Shell U.K. Ltd., Ardrossan	6,000				
	Total Scotland	192,200	16,200	21,600	81,000	
	Wales					
	BP Refinery Ltd., Llandarcy, Neath	174,800	14,400 FCC	13,050	6,300 HDT 13,950 HDS	51,100 V, 5,400 L, 800 A
	Esso Petroleum Co. Ltd., Milford Haven, Pembrokeshire	309,000		43,000	32,000 HDT 56,000 HDS	
	Gulf Oil Refining Ltd., Milford Haven	103,000		23,000	46,500 HDS	
	Texaco Ltd., Pembroke	180,000		17,500	51,000 HDT	10,000 V
	Total Wales	766,800	14,400	96,550	205,750	
	TOTAL UNITED KINGDOM	2,782,980	205,300	410,010	854,760	

	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro-processing	Other processing
URUGUAY	Administración Nacional de Combustibles, Alcohol y Portland, La Teja, Montevideo	43,000	4,000 FCC	3,000	8,000 HDS	12,000 V, 400 C, 3,100 A
VENEZUELA	Chevron Oil Co. of Venezuela, Bajo Grande	61,500				15,300 V, 7,000 A
	Cia. Shell de Venezuela, Cardón	348,000	32,000 FCC		44,000 HDT 32,000 HDS	
	Sa. Lorenzo	32,000				
	Corporación Venezolana del Petróleo, Morón	30,000		1,600		
	Creole Petroleum Corp., Amuay	630,000		13,000	17,000 HDT 230,000 HDS	345,000 V, 2,500 L, 35,000 A
	Quiriquire	110,000				
	Mobil Oil de Venezuela, El Palito	102,000		6,000	6,000 HDT	
	Phillips Petroleum Co., San Roque	5,100				
	Sinclair-Venezuelan Oil Co., El Chaure	40,000				
	El Toreño	5,400				
	Texas Petroleum Co., Tucupita	10,000				
	Venezuela Gulf Refining Co., Puerto la Cruz	157,715	14,589 FCC			2,268 Alky
	Total	1,531,715	48,589	20,600	329,000	
VIRGIN ISLANDS	Hess Oil Virgin Islands Corp., St. Croix	590,000			93,600 HDS	105,000 V
YUGOSLAVIA	Bosanski Brod	53,982		5,861	945 HC	1,200 V, 666 A
	Lendava	10,447				
	Novi Sad	12,500				
	Pancevo	29,878		3,996	8,793 HDS	
	Rijeka	96,135		13,720	4,662 HDS	4,000 L, 866 A
	Sisak	76,627	2,997	2,664	2,464 HDS	1,000 A
ZAIRE	Sozir—Société Zairo-Italienne de Raffinage, Muanda	16,150		2,700	4,500 HDS	
ZAMBIA	Indeni Petroleum Refinery Co. Ltd., Ndola	24,620		5,600	9,000 HDS	2,400 V, 800 A

Worldwide production

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow-ing	Pump-ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
ABU DHABI	Asab, 1965		17				450,000	83,400,000	40.0
	Abu al Bu Khoosh, 1973		(Started production at 20,000 b/d in Aug., 1974 from 2 wells)						
	Bab (Murban), 1960	8,500	22				110,000	1,428,300,000	38.0-40
	Bu Hasa, 1962	8,500	41				679,820		
	El Bunduq, 1965*	8,500				15			
	Mubarras, 1971*	11,000	20			12	22,000	5,200,000	38.1
	Umm Shaif, 1958*	9,150	27			10	206,446	451,262,526	37.7
	Zakum, 1964*	9,100	33			8	284,531	531,691,675	40.1
	Total		160			35	1,752,797	2,499,854,201	
*Offshore. †To go on production in April, 1975.									
AFGHAN-ISTAN*	Angot, 1950	2,100							51
	Hodja-Gugerdag, 1961	4,170-4,700							51
	Khulaja-Borhan, 1964								51
	Sar-i-pul, 1959	5,000	13	2			150†	138,900†	51
	Yatim Tagh, 1950	1,290-4,019							51
	Total		13	2			150	138,900	
*Data estimated. † Condensate. Note: Gas production estimated 250 MMcfd.									
ALGERIA	Alrep								
	Haoud Berkaoui, 1965	10,300	9			2	32,235	85,432,775	46.0
	Hassi Messaoud North, 1956	11,000	108			15	222,000	790,867,000	49.0
	C.P.A.								
	Gassi Touil and E., 1966	6,930	58			18	69,780	29,912,000	44.0
	Creps								
	Acheb, 1963	7,382	7			2	5,484	12,367,660	43.0
	Edjeleh, 1956	1,900-3,000	40		90	62	19,775	154,352,000	35.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
	El Adeb Larache, 1958	4,100	21	...	...	16	9,800	36,027,000	44.5
	Hassi Mazoula, 1962	4,231-4,400	1	9	...	7	8,844	15,002,000	41.0
	Ohanet, S. (& N.), 1960	7,920	21	...	...	16	1,795	72,445,175	44.0
	Tiguentourine, 1956	3,526	43	...	...	36	7,030	41,067,950	45.0
	Tin Fouye, 1961	1,300-2,040	35	9	...	5	7,562	139,359,000	39.0-41.0
	Zarzaitaine, 1958	4,600	25	...	45	31	80,600	488,463,000	42.0
	Petral								
	Askarene, 1962	8,250	...	9	...	...	574	15,620,500	44.0
	Guelta, 1962	7,810	4	...	...	3	555	16,199,575	44.0
	Repal								
	Hassi Messaoud, S., 1956	11,000	145	...	...	16	338,077	1,071,398,000	49.0
	Nezla, 1965	8,500	2	...	...	3	2,359	18,861,000	48.0
	Sepal								
	El Gassi El Agreb, 1959	9,300	22	...	...	21	38,516	160,938,340	47.0
	Sonatrach								
	Djebel Onk, 1960	3,900	...	4	...	8	750	1,970,750	37.0
	Djoua W., 1966	2,600	1	...	...	5	166	4,938,600	40.0
	El Borma, 1967	2,495	8	...	...	...	3,341	3,807,487	45.0
	Rhourde El Baguei, 1962	3,182	17	...	...	1	10,000	242,640,000	40.0
	Timedratine, 1965	8,250	13	...	...	2	1,466	4,149,100	41.0
	Tin Fouye Tabankort, 1966	4,500-6,700	49	...	...	6	5,082	45,829,900	41.0
	Rhourde Noua, 1963	2,820	5	...	...	3	865	11,501,725	50.0
	Others		25	...	...	16	22,149	20,741,385	
	Total		660	31	135	294	888,805	3,483,891,922	

*Some data estimated.

ANGOLA

ANGOLA PROPER:									
Bento, 1972	7,500	2	...	...	...	...	2,440	1,109,874	26.1
Cabeca da Cobra, 1970	4,200	7	...	...	...	3	894	956,711	41.1
Mulenvos, 1966	6,500	1	6	...	...	3	721	3,556,771	22.6
N'Zombo, 1973	6,100-6,300	4	...	...	...	...	5,495	1,230,719	30.4
Quenguela Norte, 1968	4,900-6,200	22	4	...	...	24	5,457	22,424,773	31.0
Quingula, 1972	4,100	11	...	...	...	...	5,227	2,114,647	35.9
Others	2,100-9,900	6	2	...	...	18	752	32,988,358	29.7
Subtotal		53	12	...	...	48	20,986	64,381,871	
CABINDA:*									
Malongo, N., 1966	1,500-8,500	10	...	43	...	2	42,460	96,562,400	21.1-38.0
Malongo, L., 1966	1,300-1,600	...	...	27	...	...	11,767	28,720,722	23.0-27.0
Malongo, W., 1969	1,800-8,750	20	...	16	...	12	86,210	84,227,042	18.0-34.0
Subtotal		30	...	86	...	14	140,437	209,510,164	
Total		83	12	86	...	62	161,423	273,892,017	

*All offshore

ARGENTINA

Chubut, 1907	2,500-6,000	...	5	...	...	1	75,981	572,500,524	22.8-24.5
Juvv, 1969	11,000-15,000	25	...	...	...	...	24,824	22,012,654	23.0
La Pampa, 1968	5,000-5,500	17	...	...	...	...	12,894	15,899,134	...
Mendoza, 1932	7,500-8,000	?	800	...	...	31	112,289	523,212,915	...
Neuquen, 1918	3,000-6,000	50	300	...	...	50	48,153	184,154,078	30.0
Rio Negro, 1959	2,800-6,000	200	250	...	...	110	64,383	171,574,477	...
Salta, 1928	1,100-15,000	60	15	...	...	140	3,871	83,676,499	22.5-54.0
Santa Cruz, 1944	4,000-6,000	200	2,140	...	...	365	68,159	506,971,408	41.8
Tierra del Fuego, 1952	6,000-7,000	5	25	...	...	10	8,636	43,357,803	41.0
Others		...	...	...	...	...	2,845	240,976,417	...
Total		560	3,535	...	...	707	421,945	2,364,335,909	

Note: Production data are as of 1-1-74 (source: AAPG), well data estimated.

AUSTRALIA

Alton, 1964	6,000	...	4	...	...	2	131	1,651,927	52.0
Barracouta, 1965*	4,700	...	...	...	...	2	3,600	8,656,000	62.8
Barrow Island, 1964*	2,200-6,700	16	180	109	...	28	39,214	99,005,933	38.0
Halibut, 1967*	7,600	7	...	...	...	12	112,300	227,240,000	43.3
Moonie, 1961	5,800	1	2	17	...	2	1,358	17,503,000	44.0
Kingfish, 1967*	7,500	40	...	...	...	2	214,000	194,472,000	46.9
Total		64	186	126	...	48	370,603	548,528,860	

*Offshore.

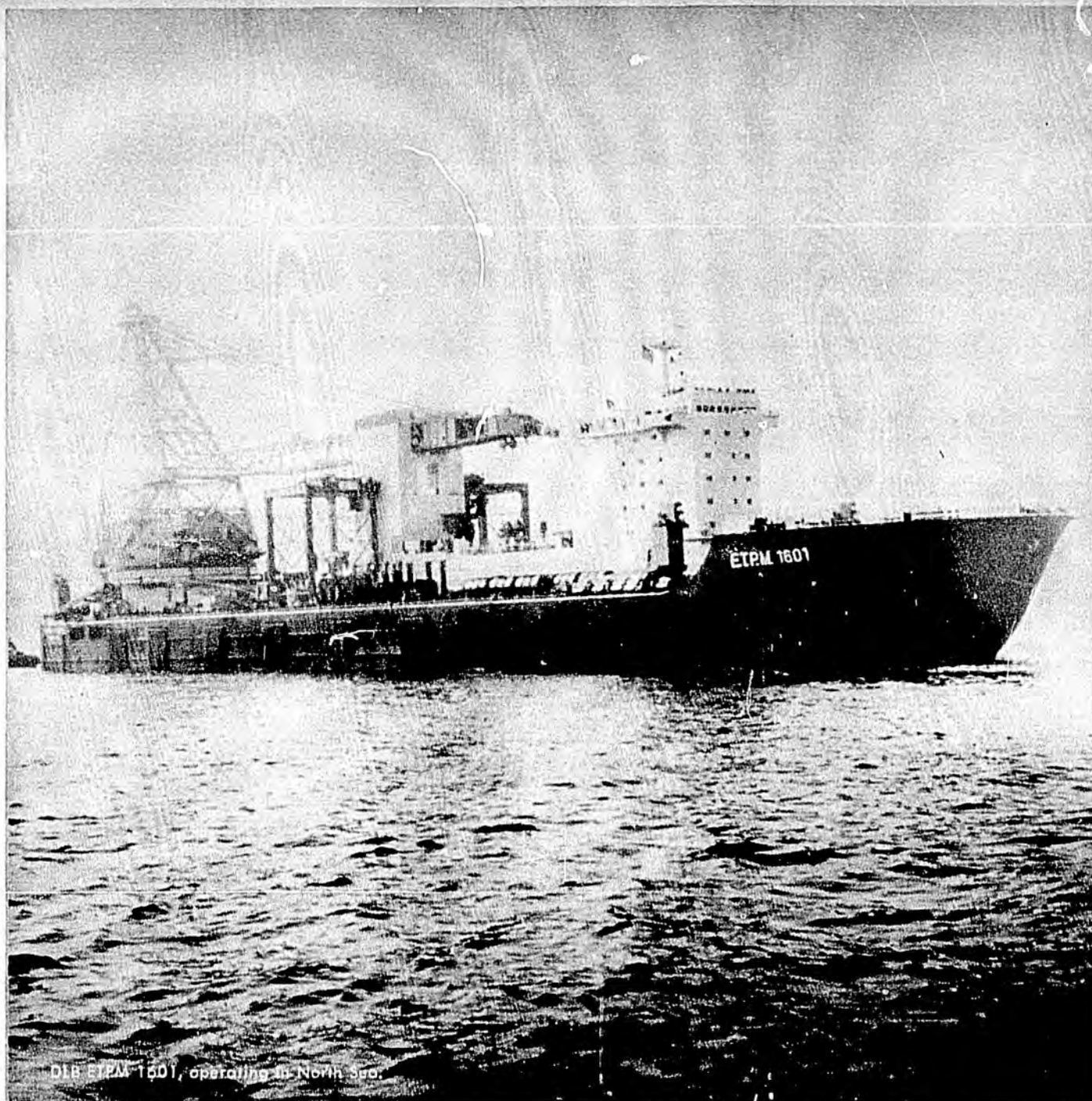
AUSTRIA

Vienna Basin									
Matzen, 1949	4,200-7,200	64	514	243	116	...	22,971	305,458,762	25.7
Muehlberg, 1942	3,900-5,500	...	43	14	6	...	692	36,077,300	35.0
Pirawarth, 1957	1,600-6,500	4	...	53	4	...	2,033	5,762,043	28.4
St. Ulrich, 1938	1,600-4,300	2	124	...	133	...	1,504	36,674,736	33.0
Schoenkirchen & Prottes Tief, 1962	7,800-10,100	16	2	2	5	...	10,635	42,949,452	31.1
Gaiselberg, 1938	3,400-6,500	...	34	...	25	...	1,050	28,007,056	24.8
Others		3	80	...	46	...	1,172	48,965,798	30.8
Molasse Zone									
Piberbach, 1968	3,500	6	...	...	1	...	780	1,728,108	39.0
Sattledt, 1971	5,580	...	8	...	3	...	1,330	62,020	37.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flowing	Pumping	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
AUSTRIA—Continued	Voitsdorf, 1962	6,900	3	18	...	6	3,045	14,695,345	35.8
	Others		2	36	...	8	1,847	8,266,282	34.0
	Total		100	859	312	353	47,059	529,346,902	
BAHRAIN	Awali, 1932	1,850-4,600	162	30	19	33	67,975	555,959,500	33.0
BARBADOS	Fisher Pond, 1966			3	...	...	215	85,629	...
	Woodbourne, 1966			2	...	...	95	43,952	...
	Others			3	...	...	31	11,205	...
	Total			8	...	...	341	140,786	
BOLIVIA	Camiri, 1927	3,936	18	1	55	...	1,665	43,344,808	52.0-55.0
	Caranda, 1960	3,936	41	...	5	...	6,169	43,984,299	49.5
	Caigua, 1973	3,936	2	...	...	...	4,072	275,435	47.0
	Colpa, 1961	9,184	26	...	...	...	4,753	10,228,431	46.0
	La Yena, 1965	8,856	19	...	...	...	7,501	4,998,057	43.0
	Monteagudo, 1966	4,592	29	...	1	...	8,395	13,961,698	48.0
	Rio Grande, 1961	9,184	30	...	...	...	13,543	14,907,796	62.0
	Tatarenda, 1962	2,296	5	13	...	...	888	5,472,335	...
	Others			36	...	...	536	8,592,307	...
	Total		170	50	61	...	47,522	145,765,166	
BRAZIL	Agua Grande, 1951	3,281-6,562	40	44	...	80	18,800	221,808,000	38.0-42.0
	Aracas, 1965	3,281-6,562	6	67	...	25	28,800	53,112,000	41.0
	Buracica, 1959	2,395-2,559		84	...	13	19,410	100,966,000	35.0
	Candeias, 1941	3,281-6,562	10	24	...	100	5,682	63,804,979	30.0-31.0
	Carmopolis, 1963	2,460		190	...	7	19,240	53,735,000	24.0
	Cassarongongo, 1959	4,757		19	...	6	3,235	7,338,000	32.0
	Dom Joao, 1947	918		370	...	125	10,000	59,597,500	38.0
	Faz. Boa Esperanca, 1966	7,874-8,530	3	4	...	...	2,700	5,869,500	38.0-40.0
	Imbe, 1964	2,132-8,202	4	16	...	6	3,100	7,074,000	38.0-42.0
	Guaricema, 1968*	3,543	12	...	...	5	4,800	1,682,448	43.0
	Malombe, 1966	3,281		14	...	1	1,700	2,861,000	31.0
	Miranga, 1965	3,281-6,542	34	77	...	33	32,000	104,373,599	39.0-41.0
	Riachuelo, 1961	1,476		50	...	8	2,000	4,481,000	28.0
	Siririzinho, 1967	1,640		80	...	4	5,500	11,574,000	30.0
	Taquipe, 1959	3,117-3,937	8	55	...	15	8,500	56,460,500	40.0
	Others			40	...	75	6,722	24,934,000	...
	Total		117	1,134	...	503	172,129	779,671,526	
	*Offshore								
BRUNEI-MALAYSIA	Amipa, SW, 1963*	7,068-8,155	81	...	...	34	111,399	246,442,177	41.0
	Bakau, 1971*	11,000	1	...	...	...	1,865	1,820,655	39.0
	Baram, 1967*	9,500	29	...	...	2	53,440	50,739,639	40.5
	Baronia, 1970*	11,000	1	...	...	...	2,500	1,570,333	42.0
	Champion, 1970*	4,300	30	...	...	3	35,853	24,315,492	23.0
	Fairley, 1969*	10,740	11	...	...	1	28,599	21,777,859	40.0
	Seria, 1928		345	...	...	170	39,051	823,663,692	34.0
	West Lutong, 1965*		21	...	...	3	53,440	63,031,656	39.5
	Others (Miri, Jerudong)							80,200,000	...
	Total		519	...	...	213	326,147	1,313,561,503	
	*Offshore								
BURMA*	Chauk-Lanywa, 1902		2	290	...	...	2,000		
	Mann, 1970	3,955-6,934	30	5	...	...	10,000		
	Myanaung, 1965			80	...	...	6,000		
	Prome, ?			20	...	...	1,000		
	Yenangyaung, 1902	5,000		200	...	...	4,000	157,617,000	
	Total		32	595	...	...	23,000		
	*Data estimated.								

	Name of field and discovery date	Depth (ft)	No. of wells capable of production	Daily avg. 1st 6 mos. 1974	Cumulative 7/1/74	Gravity °API
CANADA	ALBERTA					
	Acheson, 1950	4,600-5,100	98	11,626	60,617,582	38.0
	Bantry, 1948	3,250	104	5,388	18,000,100	25.0
	Bellshill Lake, 1956	3,000	142	5,500	18,442,414	27.0
	Bonnie Glen, 1952	3,950-7,100	173	51,127	202,768,853	38.0-42.0
	Carson Creek, North, 1958	8,650-8,750	60	18,577	46,301,440	44.0
	Cessford, 1952	3,000-3,350	75	2,925	12,871,143	24.0-26.0
	Chauvin, 1952	2,050	37	3,055	4,746,712	22.0
	Clive, 1951	6,150-6,250	130	6,444	18,113,655	40.0-41.0

Name of field and discovery date	Depth (ft)	No. of wells capable of production	Daily avg. 1st 6 mos. 1974	Cumulative 7/1/74	Gravity °API
CANADA—Continued					
Crossfield, 1956	6,650	88	1,520	14,757,875	38.0
Erskine, 1952	5,400	90	1,959	17,856,384	28.0
Excelsior, 1949	3,900	33	2,253	16,789,370	36.0
Fenn-Big Valley, 1950	5,300-5,400	314	27,080	143,335,501	26.0-32.0
Garrington, 1954	6,600	95	1,550	12,815,104	39.0
Gilby, 1953	5,850-7,050	79	5,823	28,102,735	27.0-38.0
Glen Park, 1951	6,300	10	2,487	9,953,847	38.0
Golden Spike, 1949	5,050-5,650	26	36,027	162,387,347	37.0
Goose River, 1963	9,200	23	6,390	14,209,163	41.0
Harmattan, East, 1957	8,600	107	8,210	33,700,531	38.0
Harmattan Elkton, 1955	8,796-9,000	67	5,224	31,228,165	38.0
Hassar, 1957	4,800	35	2,898	11,728,501	36.0
Innisfail, 1957	8,600	83	8,050	37,218,502	44.0
Joarcam, 1949	3,250	281	7,680	72,669,447	38.0
Joffre, 1953	5,000-7,000	132	8,656	66,324,791	41.0-42.0
Judy Creek, 1959	8,650-8,850	214	61,853	172,505,676	41.0-42.0
Kaybob, 1957	9,800	86	14,189	50,939,059	43.0
Kaybob, South, 1962	6,900	95	8,592	21,910,984	42.0
Leduc, 1947	4,200-5,450	788	20,400	322,736,744	40.0
Lloydminster, 1939	2,000	253	2,322	19,685,264	16.0
Medicine River, 1956	7,050-7,250	53	6,943	7,103,752	26.0-27.0
Mitsue, 1964	5,650	236	42,413	91,138,488	43.0
Nipisi, 1965	5,600	187	40,472	77,776,926	41.0
Pembina, 1953	3,200-5,100	3,059	138,817	788,717,635	37.0-38.0
Provost, 1952	2,760-2,768	291	6,535	14,466,742	38.0-42.0
Rainbow, 1965	5,950-6,400	23	80,149	159,779,420	38.0-42.0
Red Earth, 1956	4,700	33	4,922	11,809,690	40.0
Redwater, 1948	3,200	785	85,914	498,029,776	36.0
Simonette, 1958	11,600	22	5,669	17,390,096	47.0
Snipe Lake, 1962	8,550	93	8,625	27,997,923	37.0
Stettler, 1949	5,200-5,350	125	4,406	32,787,681	28.0-30.0
Sturgeon Lake, 1952	8,850	18	2,689	11,287,562	37.0-38.0
Sturgeon Lake, South, 1953	4,900-8,500	143	15,676	66,544,960	36.0-38.0
Sundre, 1955	9,050	47	3,490	20,194,299	32.0
Swan Hills, 1957	7,450-8,300	692	105,209	309,877,498	41.0-42.0
Swan Hills, South, 1959	8,400	193	48,403	135,208,354	41.0
Sylvan Lake, 1962	7,300-7,450	33	3,170	9,388,540	28.0
Taber, South, 1963	3,250	24	3,149	10,006,116	19.0
Turner Valley, 1914	2,500-9,000	170	2,763	123,261,023	40.0
Virginia Hills, 1957	9,300	104	21,098	64,765,304	38.0
Virgo, 1967	4,900-4,950	96	8,669	21,205,254	29.0-43.0
Wainwright, 1926	2,100	294	6,649	27,543,520	22.0
Westrose, 1952	7,250	19	15,311	48,894,556	41.0
Willesden Green, 1954	6,200	412	15,096	53,428,398	41.0
Wizard Lake, 1951	6,450	35	41,443	127,563,345	38.0
Zama, 1967	4,900	179	14,053	37,545,970	25.0-43.0
Others		1,344	328,978	77,047,283	
Total		12,428	*1,398,516	*4,513,477,000	
*All fields					
BRITISH COLUMBIA					
Aitken Creek, 1959	4,400	10	980	3,767,060	38.0
Beaton River, 1958	3,800	16	934	5,603,475	
Blueberry, 1953	6,950	33	1,519	9,572,747	40.0
Boundary Lake, 1955	4,300-4,600	331	20,994	98,792,611	
Inga, 1966	5,300	79	7,076	19,349,203	40.0
Milligan Creek, 1950	3,750	29	4,385	33,440,736	41.0
Peejay, 1959	3,900	105	7,756	44,301,107	30.0
Weasel, 1965	3,800	23	3,392	9,355,619	40.0
Others		974	4,966	15,685,443	
Total		1,600	52,002	239,878,001	
MANITоба					
Daly, 1951	2,550	148	1,354	16,470,140	32.0
Virden-Roselea, 1953	2,030	243	3,671	27,769,636	30.0
N. Virden-Scallion, 1953	2,010	244	6,509	46,144,893	35.0
Routledge, 1955	2,130	106	1,200	11,914,892	35.0
Others		80	247	2,038,185	
Total		821	12,981	104,337,746	
SASKATCHEWAN					
Alameda, 1956	4,420	87	1,492	12,723,136	40.0
Bathurst, 1955	2,900	155	6,539	33,938,885	19.0
Coleville, 1951	2,700	196	4,384	25,226,109	13.0
Dollard, 1953	4,600	57	8,219	61,580,255	23.0
Fosterton, 1952	3,200	43	4,888	46,138,217	21.0
Instow, 1954	4,500	48	5,096	33,212,924	23.0
Midale, 1953	4,600	384	8,788	74,858,082	27.0
North Premier, 1953	3,300-3,500	67	5,197	16,010,837	23.0-24.0
Steelman, 1954	4,590-4,620	616	17,988	167,345,500	38.0
Weyburn, 1955	4,600	575	23,066	182,071,094	28.0
Others		4,084	130,343	648,870,821	
Total		6,312	216,000	1,301,975,860	



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Telex : 917 914.

LEA OFFSHORE MANAGEMENT Ltd.
Woodcote Grove, Ashley Road, EPSOM,
Surrey England
Phone : Epsom 29999 - Telex : 896194

	Name of field and discovery date	Depth (ft)	No. of wells capable of production	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	Gravity °API
CANADA—Continued	ONTARIO					
	All fields			2,000	53,100,080	...
	NEW BRUNSWICK					
	Stoney Creek			24	763,399	...
	NORTHWEST TERRITORIES					
	Norman Wells		41	1,000	16,372,517	...
	Total Canada		21,202	*1,682,523	*6,229,904,603	
	*All					

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl—		Gravity °API
			Flowing	Pumping	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
CHILE	MAINLAND								
	Cañadón, 1962	6,560	15	...	8	18	1,696	10,249,312	38.4
	Daniel, 1960	5,975	37	...	18	40	4,779	28,210,426	25.4
	Daniel Este, 1961	5,740	21	...	5	14	4,321	19,445,725	25.0
	Posesión, 1960	6,100	34	...	...	7	2,506	14,125,390	63.6
	Dúgenes, 1962	6,050	7	...	1	3	747	2,363,315	28.6
	TIERRA DEL FUEGO								
	Calafate, 1955	6,200	16	...	5	33	3,353	18,155,964	49.3
	Catalina Sur, 1961	5,890	3	...	5	31	358	5,444,898	44.0
	Cullen, 1954	5,840	26	...	14	50	2,399	34,999,991	41.8
	Tres Lagos, 1957	5,640	20	...	2	37	2,097	11,014,649	40.1
	Victor Sur, 1950	7,200	...	...	6	14	452	7,223,645	39.3
	Otros		40	...	33	121	5,940	50,338,645	
	Total		219	...	97	368	28,648	201,571,960	

CHINA (TAIWAN)	Tiehchenshan, 1962	8,500-18,000	26	...	...	2	2,652	4,639,533	53.0
	Others		34	...	...	16	619	1,094,524	
	Total		60	...	...	18	3,271	5,734,057	

COLOMBIA	Acae, 1964	10,600	4	3	3	4	4,436	12,178,267	30.5
	Bonanza, 1964	4,000	4	8	1	3	2,128	7,062,835	32.3
	Boquete, 1961	8,000	12	...	...	6	3,152	10,677,912	27.2
	Caribe, 1969	7,750	2	1	...	1	1,042	1,785,958	31.9
	Casabe, 1941	3,880	...	270	...	40	6,144	197,283,929	20.8
	Chucuri-Bajo Rio, 1958	10,100	...	1	...	1	843	71,694	28.1
	Cicuco, 1961	8,000	10	...	...	13	426	41,902,747	40.3
	Colorado, 1930	3,600	4	32	...	13	694	6,350,559	39.4
	Cocorna, 1963	2,000	...	14	...	4	1,021	3,320,170	12.5
	Cristalina, 1959	10,700	...	3	...	...	738	3,782,244	30.2
	Dina, 1962	2,900	4	5	...	7	3,318	5,974,218	21.5
	Galán, 1945	3,800	...	64	...	9	1,179	14,833,647	19.0
	Infantas, 1918	3,200	1	298	...	16	4,064	208,510,209	25.8
	La Cira, 1925	3,250	...	619	...	48	17,146	406,466,926	24.0
	Lisama, 1957	9,500	8	9	...	5	2,018	4,740,318	31.0
	Llanito, 1960	7,350	2	20	...	10	1,172	9,083,613	21.0
	Orito, 1963	6,600	20	4	23	25	37,513	97,247,798	33.6
	Ortega, 1953	4,300	...	7	...	1	486	9,618,429	26.0
	Palagua-Velasquez, 1946	4,925	...	222	34	102	18,144	190,190,233	19.0
	Payoa, 1962	8,000	20	...	11	18	5,970	59,762,445	33.6
	Peñas Blancas, 1958	8,200	...	6	...	...	529	6,388,189	29.6
	Provincia, 1962	8,000	20	...	13	14	17,442	96,202,409	33.0
	Ric Zulia, 1962	5,600	4	12	...	1	16,865	101,510,219	41.2
	San Antonio, 1971	9,500	...	4	...	...	909	1,435,498	30.7
	Tello, 1972	9,200	3	...	...	...	1,147	504,518	20.9
	Tibú, 1940	4,200	30	146	22	70	10,826	249,537,540	36.5
	Tisquirama-Totumal, 1955	9,500	...	9	...	...	443	3,161,482	22.0
	Yarigui, 1943	6,850	...	39	...	3	8,995	85,922,950	20.8
	Others		1	26	...	27	942	5,954,526	
	Total		149	1,822	107	441	169,732	1,841,461,482	

CONGO REPUBLIC (Brazzaville)	Emeraude Marine, 1969*	1,000	...	49	...	5	51,000	25,537,000	23.0
	Pointe Indienne, 1957	5,000	3	...	...	6	220	5,912,600	36.9
	Total		3	49	...	11	51,220	28,735,250	

*Offshore

DENMARK	Dan, 1971*	6,700	6	...	...	2	(t)	1,641,000	30.4
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*Offshore. †Shut down temporarily—resumed production July 1, 1974

DUBAI	Fateh, 1966*	7,600	3,000	24	...	9	132,892	199,104,476	31.8
	Fateh SW, 1970*	7,500	9,000	12	...	1	98,482	59,696,127	32.0
	Total			36	...	9	231,374	258,800,603	

*Offshore.

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow-ing	Pump-ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
ECUADOR	COASTAL:								
	Ancor, 1921	4,000	7	540		1,671	2,391	99,107,336	36.5-37.0
	Others	1,000-3,000	18	156		308	408	9,124,979	30.5-37.0
	ORIENTE:								
	Aguarico, 1969	9,400	9				7,962	1,441,133	29.5
	Lago Agrio, 1967	10,120	20			6	47,301	29,716,724	28.6
	Sacha, 1969	9,900	58			16	79,132	62,129,165	29.7
	Shushufirdi, 1969	9,400	11		24	15	94,668	50,806,826	31.7
	Total		123	696	24	2,016	231,862	252,326,163	
EGYPT	Abu Gharadig, 1972	9,500	2			11	1,475	4,290,295	36.0
	Abu Rudeis, 1957†	8,500						13,204,947	23.0
	Al Yusr, 1966	4,264	15				7,167	12,222,447	
	Asi, 1948†	3,000						34,269,304	23.0
	Belayim (Land and Offshore), 1954†*	7,000-8,500						224,777,435	28.0
	El Alamein, 1966	8,700		8		12	997‡	8,508,275	19.0
	El Morgan, 1965*								
	Kareim	5,500-6,400	16		24	2	39,594	420,492,068	32.0
	Belayim	5,100-5,700	5		4		8,594	6,974,854	27.0
	July, 1973*	9,000	3				13,056	2,450,589	34.0
	Kareem, 1968	2,200		8		12	997‡	8,508,275	19.0
	Ras Amer, 1965	4,264	1	3			866‡	2,860,411	20.0
	Ras Bakr, 1958	3,280	15	35			7,789‡	47,454,752	20.0
	Ras Gharib, 1938	2,100		90		12	7,298‡	217,179,819	25.0
	Razzak, 1972	7,700	11			2	17,302	11,742,447	36.0
	Sidri, 1959†	8,100						4,308,786	23.0
	Sudr, 1946†							39,198,071	23.0
	Uyun, 1968			90			1,653	1,237,389	
	Yidma, 1971	9,000		5			5,300	7,065,576	43.5
	Others		10	2		1	444	325,104	
	Total Egypt		78	241	28	46	118,335	1,103,923,932	
*Offshore. †These fields on Sinai Peninsula being produced by Israel, who refuses figures. Daily output is estimated at 120,000 bbl. Cumulative figures for the captured fields are carried forward for the record (data as of June 5, 1967). ‡Data are estimated.									
FRANCE	ALSACE (All fields shut in)							26,368,290	
	AQUITAINE BASIN								
	Esso Rep fields:								
	Cazaux, 1959	8,200	3	25		2	4,045	43,339,866	34.1-37.5
	Lavergne, 1962	10,650	2	1			322	8,768,979	40.4
	Lugos, 1956	4,900	6			1	405	3,193,516	20.8
	Parentis, 1954	7,710	5	17		4	7,804	160,516,393	33.0
	Others		1	12		2	790	13,683,401	
	Erap fields:								
	Bonrepos, 1973	9,300		1			33	181,091	42.8
	Montastruc, 1973	9,810	1				755	21,652	42.0
	SNPA fields:								
	Lacq, 1949	2,165	11	21		15	1,161	22,309,479	20.6
	PARIS BASIN								
	Copeseq fields	1,530-4,525		13		1	441	6,370,994	19.9-32.8
	Erap fields:								
	Chailly-en-Biere, 1958	5,575		20		12	474	7,518,015	35.3
	Chuelles, 1961	2,000		28		12	395	4,334,908	27.1
	Saint-Firmin, 1960	2,000		33		11	789	6,170,383	27.8
	Villemer, 1958	4,985		6		7	417	3,473,238	31.4
	Others		2	52		16	1,402	15,322,783	
	Petrorep fields:								
	Coulommies, 1958	6,070	4	27		11	937	10,390,097	32.6
	Total France		35	256		94	20,170	331,963,085	
GABON	Anguille Marine, 1962*	8,300	16			3	28,200	57,036,000	31.8
	Anguille, Northeast, 1968*	7,480	10				13,000	20,327,000	31.4
	Anguille, Northwest, 1968*	7,000	2				2,000	2,010,385	31.4
	Cap Lopez, N., 1962	6,700	4			5	5,900	16,401,500	23.9
	Gamba, 1963	3,000	31			12	29,584	98,604,344	32.4
	GBM, 1969	6,500-7,500				2	(not yet producing)		33.0-33.8
	Ivinga, 1967	3,100	25			4	21,846	40,598,928	32.5
	Lucina Marine, 1971*	Not yet on stream. Three oil wells finished at about 6,100 ft.							
	Pointe Clairette, 1956	4,000-5,000	17			12	2,750	25,330,750	29.9
	Port Gentil Ocean, 1964*	8,100	3			2	3,750	10,233,750	33.6
	Tchengue, 1959	3,500	9			14	3,500	22,277,500	30.6
	Tchengue Ocean, 1962*	6,200	5			1	1,500	5,547,500	33.1
	Torpille Marine, 1968*	9,487	10				11,000	9,886,000	33.9
	Others		5			5			
	Total		137			60	123,030	308,253,657	
	*Offshore								
	Note: Elf data estimated.								

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
GERMANY, WEST	BAVARIA								
	Arlesried, 1964	4,900	...	12	...	5	2,469	6,822,519	47.0
	Darching, 1967	14,400	1	...	...	...	1,679	2,392,277	
	Moenchsrot, 1958	4,800	...	18	...	...	1,204	6,979,224	36.0
	Others		9	26	...	...	1,846	17,532,091	
	Total		10	56	...	5	7,198	33,726,111	
	EMSLAND								
	Emlichheim, 1944	2,600	...	99	...	...	3,385	28,192,364	25.0
	Georgsdorf, 1944	1,800-2,600	45	163	...	4	8,610	65,802,957	24.0-29.0
	Meppen-Schwefingen, 1960	4,000	10	12	...	...	1,391	6,180,959	28.0-30.0
	Ruhlermoor, 1949	2,000-4,700	10	246	...	10	12,520	88,402,752	25.0-34.0
	Ruhlerst, 1949	2,350-2,900	6	103	...	...	1,990	22,392,447	25.0
	Scheerhorn, 1949	3,550-3,750	...	123	...	5	4,831	31,026,663	30.0
	Others		...	156	...	...	1,692	23,297,702	
	Total		71	902	...	19	34,419	265,295,844	
	SCHLESWIG-HOLSTEIN								
	Plon-Ost, 1959	6,400	2	55	...	1	7,311	32,835,310	36.0
	Preetz, 1962	8,350-8,550	1	24	...	...	1,041	7,906,367	29.0
	Reitbrook, 1937	1,450-2,100	6	38	...	9	2,021	31,561,860	29.0
	Others		1	81	...	4	1,472	41,921,770	
	Total		10	198	...	14	11,845	114,225,307	
	HANNOVER								
	Eldingen, 1949	4,750	...	27	...	...	1,622	13,961,896	35.0
	Hankensbuttel, 1954	4,450-5,100	10	37	...	...	9,380	63,302,557	33.0
	Hardesse, 1958	6,050	9	11	...	...	849	3,316,343	34.0
	Hohne, 1951	4,300-5,900	...	34	...	3	3,063	32,902,948	33.0-34.0
	Kuesebeck, 1958	5,100-5,200	...	24	...	...	2,143	10,505,290	36.0
	Leiferde, 1956	2,600	2	34	...	...	2,458	15,162,434	34.0
	Luben, 1955	3,950	1	14	...	...	1,247	7,333,149	35.0-38.0
	Meckelfeld, 1938	1,000-1,300	1	24	...	1	1,253	11,131,507	24.0-32.0
	Nienhagen-Haenigsen, 1899	800-4,100	...	68	...	5	944	55,521,775	22.0-32.0
	Oelheim-Süd, 1968	1,650	9	4	...	...	1,190	2,921,707	33.0
	Oerrel-Wesendorf-Nord, 1954	4,450	...	38	...	...	1,077	7,560,590	
	Ruehme, 1954	1,950	...	39	...	1	1,019	5,534,848	
	Sinstorf, 1960	6,750-7,150	...	20	...	...	2,356	12,880,869	
	Suderbruch, 1949	3,750-7,550	...	60	...	...	1,138	19,137,035	19.0-38.0
	Volthop, 1952	2,950-6,900	2	24	...	4	1,413	10,986,830	36.0
	Others		...	262	...	...	4,792	134,833,303	
	Total		34	720	...	14	35,944	406,993,081	
	UPPER RHINE VALLEY								
	Landau, 1955	3,950-4,800	...	76	...	2	2,950	16,781,250	36.0
	Others		...	21	...	1	312	10,051,359	
	Total		...	97	...	3	3,262	26,832,609	
	WESER-EMS								
	Barenburg, 1953	2,300-3,300	9	32	...	1	2,641	24,603,940	29.0
	Rockstedt, 1954	3,750	...	25	...	3	2,249	12,706,859	
	Bramberge, 1958	2,560-3,300	56	6	...	...	2,992	50,431,806	29.0
	Dueste, 1954	2,600-4,250	...	156	...	...	2,928	31,516,104	
	Gross Lessen, 1969	3,300	4	...	...	...	6,798	7,774,865	
	Sued-Oldenburg, 1950	1,700-6,500	4	93	...	13	2,198	31,637,738	
	Voigtei, 1953	1,150-1,500	2	68	...	12	1,545	19,147,778	31.0-34.0
	Wehrbleck, 1957	3,400	...	63	...	...	1,295	10,731,388	33.0
	Others		...	83	...	...	2,281	19,201,325	
	Total		75	526	...	29	24,927	207,751,803	
	Total Germany, West		200	2,499	...	84	117,595	1,054,824,755	
GUATEMALA	Rubel Santo, 1974	5,300	...	...	...	1	...	...	30.0
	Tortugas, 1974	2,400	...	...	...	2	...	...	35.0
	Total		...	...	...	3	...	...	
Note: These two new fields, first for Guatemala, are not yet on production.									
ISRAEL	Heletz-Brur, 1955	5,200	...	18	...	1	660	11,005,015	29.0
	Kochav, 1963	5,500	...	7	...	2	169	3,682,581	26.5
	Total Israel		...	25	...	3	829	14,687,596	
ITALY	Gela, 1956*	10,720-10,870	35	27	...	19	10,227	76,588,397	6.5-15.1
	Pisticci-S. Cataldo, 1960	6,820-6,880	7	...	...	3	842	3,704,005	11.4
	Torrente Tona, 1963	4,370-4,430	1	3	...	1	232	780,278	25.7
	Malossa, 1973	18,080-18,190	1	...	...	...	630	6,123	52.0
	Ragusa, 1954	5,400-5,440	5	...	...	18	142	7,669,100	31.1-55.2
	Others	5,690-5,860	...	32	...	17	6,255	103,955,134	19.5
	Total		49	62	...	58	18,328	192,703,037	
*Partly offshore.									

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
INDIA*	GUJARAT STATE								
	An.leshwar, 1960	2,953- 3,937		186					
	Bakrol, 1968	4,593- 4,921		2					
	Kadi, N., 1968	2,953- 3,909		9					
	Kadi, S., 1968	5,906- 6,552		6					
	Kalol, 1961	4,265- 5,000		106					
	Kathana, 1965	5,250- 5,000		6					
	Kholka, 1966	4,265- 5,577		5			78,000		
	Kosamba, 1963	1,968- 2,625		6					
	Nawagam, 1963	4,429- 6,562		63					
	Sanand, 1963	4,265- 4,593		13					
	Sobhasen, 1968	4,429- 5,906		9					
	Wovel, 1963	4,265- 4,593		1				512,512,000	22.0-48.0
	ASSAM STATE								
	Digboi, 1890	300- 7,500		733					
	Geleki, 1968	12,632-12,795		1					
	Lakwa, 1965	8,038-12,795		64					
	Moran, 1958	11,000		45			78,000		
	Nahorkatiya, 1953	9,500		251					
Rudrasagar, 1961	10,171-10,500		39						
	Total			1,545			156,000		
	*Data estimated.								

INDONESIA									
	Pertamina Unit I:								
	Rantau, 1929	950- 4,540	110	2	115	227	28,732	190,020,630	48.0
	Paluh Tabuhan, 1937	3,727- 4,009	21			38	1,754	8,222,753	49.0
	Serang Jaya, 1926	4,600- 4,636	17		1	57	873	6,964,411	46.0
	Others		8	2		454	682	55,887,527	N.A.
	Total		156	4	116	776	32,041	261,095,321	
	Pertamina Unit II:								
	Dajubang, 1922	3,300		15		106	530	38,469,762	42.3
	Kenali Asam, 1931	3,800	6	45	6	187	1,520	85,835,617	24.2
	Tempino, 1931	2,700	2	55		118	1,655	80,388,225	42.3
	Tanjung Tiga, 1948	4,600		33		42	3,241	46,275,441	27.8
	Talang Akar, 1937	4,200	3	73		126	4,960	154,800,533	27.8
	Prabumulih Barat, 1953	4,740- 5,640	1		3	9	550	9,596,922	27.8
	Limau, 1928	4,500- 5,400	22		79	145	9,593	190,409,838	27.8
	Gunung Kemala, 1938	6,340	10		1	41	1,400	22,501,594	27.8
	Belimbing, 1964	5,280	3		8	10	3,057	14,795,963	27.8
	Kuang, 1967	4,800	1		6	9	1,153	3,700,848	27.8
	East Benakat, 1974		8			4	1,873	339,033	27.8
	Others		2	6	2	45	655	71,022,633	
	Total		58	227	105	842	30,187	718,136,409	
	Pertamina Unit III:								
	Jatibarang, 1970	3,500- 7,000	18			62	34,357	13,529,410	30.0
	Others		1	16		28	146	11,381,095	
	Total		19	16		90	34,503	24,910,505	
	Pertamina Unit IV:								
	Samboja, 1916	1,600	1	23		290	506	61,748,831	32.4
	Bunyu, 1923	2,020- 7,800	11		17	52	7,374	55,383,231	24.5-32.6
	Tanjung, 1938	2,500- 7,300	4	55		609	7,609	92,625,694	32.8
	Total		16	78	17	951	15,489	209,757,756	
	Pertamina Unit V:								
	Klamono, 1936	500		35		6	1,460	87,999,686	18.5
	Lemigas:								
	Kawengan, 1929	1,750- 2,700		21		116	516	83,978,364	39.0
	Others		2	32		332	466	26,649,194	
	Total Lemigas		2	53		448	982	110,627,558	
	P.T. Caltex:								
	Minas, 1944	2,400		193		80	420,356	1,744,146,961	33.3
	Petani, 1964	4,700		20		3	72,276	146,814,815	30.9
	Duri, 1941	600		349		93	29,451	242,557,885	21.6
	Pematang, 1959	2,800		20		3	53,562	122,864,047	31.3
	Bekasap, 1955	2,500		24		5	72,937	259,306,092	33.1
	Pungut, 1959	2,800		5		4	10,766	15,445,702	36.5
	No. Menggala, 1968	3,600		13		1	21,252	10,026,628	15.2
	Rangau, 1968	6,000		5		1	2,397	3,324,297	40.1
	So Bekasap, 1968	3,500		5		3	6,559	13,000,556	33.7
	Pematang Bow, 1969	5,000		3		1	1,532	1,552,949	35.8
	Kotabatak, 1952	4,700		30		11	22,713	34,957,610	29.7
	Tandun, 1970	3,000		4		1	2,852	4,726,130	32.7
	Mindal, 1971	3,200		3		1	627	1,543,369	24.0
	Pudu, 1972	5,500		5		1	9,634	4,909,493	35.5
	Bangko, 1970	1,500		34		2	111,889	102,103,311	31.1

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
	So Balam, 1969	1,500	...	21	...	1	22,147	20,471,758	33.3
	Petapahan, 1971	4,300	...	12	...	6	42,967	22,476,395	27.9
	Suram, 1973	1,700	...	4	...	3	4,107	968,502	27.4
	Sintong, 1971	2,400	1	13	...	1	19,079	14,792,112	28.3
	Pinggir, 1973	3,200	...	3	...	2	3,369	853,806	34.9
	So Menggala, 1968	4,000	...	3	...	...	10,361	4,223,803	33.7
	So Pinggir, 1974	3,255	...	2	...	1	1,482	268,228	38.2
	S.E. Balam, 1973	4,370	...	2	...	...	447	81,528	14.3
	Kulin, 1973	1,400	...	16	...	1	3,131	1,406,999	18.6
	Benar, 1973	2,200	3	...	...	1	8,771	3,124,739	21.8
	N. Sintong, 1973	2,750	2	...	...	2	5,791	1,105,347	16.4
	Aman, 1974	3,280	...	2	...	...	677	122,582	35.1
	Others	...	...	...	...	4	...	2,369	N.A.
	Total P.T. Caltex	...	6	791	...	232	961,132	2,777,188,014	
	P.T. Calasiatic & Tipco:								
	So Menggala, 1968	4,000	...	1	...	...	4,568	1,862,368	33.7
	Lindai, 1974	1,100	...	3	...	1	658	118,949	28.3
	Total C. & T.	...	...	4	...	1	5,226	1,981,317	
	P.T. Stanvac Indonesia:								
	Sago, 1940	1,800	...	86	...	31	7,568	104,315,945	35.0
	Lirik, 1939	1,600	...	27	...	6	5,338	25,499,527	35.0
	Andan, 1941	1,700	...	5	...	4	457	4,498,782	35.0
	N. Pulai, 1951	1,800	...	23	...	17	3,507	29,002,008	35.0
	Molek, 1956	2,600	...	14	...	4	1,378	5,026,572	35.0
	Binio, 1972	1,514- 1,720	...	19	...	4	4,655	3,493,112	34.0
	Talang Akar, 1922	2,800	9	20	4	512	618	240,611,496	35.0
	Benakat, 1932	1,600	3	62	...	207	4,167	121,727,489	35.0
	Selo, 1938	2,998	...	...	...	11	...	492,482	38.0
	Jirak, 1930	900	7	29	...	175	3,614	50,167,839	36.8
	Abab, 1951	6,000	9	4	12	55	8,451	31,151,631	33.9
	Dewa, 1971	7,675	5	...	...	13	2,346	2,971,065	35.0
	Ibul, 1970	5,600	7	...	4	18	4,768	12,879,796	38.0
	Others	...	10	8	...	216	1,443	133,863,867	
	Total P. T. Stanvac	...	50	297	20	1,273	48,310	765,701,611	
	Asamera:								
	Ice Tabue, 1971	2,112- 3,564	22	...	...	55	5,178	8,879,423	51.0
	Julo Rayeo, 1929	2,520- 2,590	23	...	...	45	2,485	7,474,101	47.0
	Tualang, 1973	2,648- 3,626	21	...	...	12	11,890	4,420,906	53.0
	Alur Simon, 1972	3,212- 3,960	4	...	...	2	484	303,293	55.4
	Others	...	2	1	...	29	165	4,848,906	
	Total Asamera	...	72	1	...	143	20,202	25,926,629	
	Pt. Si. (Corr. Block):								
	Kluang, 1913	2,515	...	10	...	32	961	1,535,289	45.0
	Others	...	1	10	...	95	254	21,857,963	
	Total PT. Si. (C. Block)	...	1	20	...	127	1,215	23,393,252	
	IIAPCO:								
	Cinta, 1971	4,500	2	12	...	1	53,018	38,138,786	31.8
	Kitty, 1973	4,000	...	6	...	...	3,692	1,579,405	17.3-22.8
	Total IIAPCO	...	2	18	...	1	56,710	39,718,191	
	ARCO:								
	Ardjuna, 1971	2,418- 6,205	48	...	2	2	90,541	51,988,762	36.9
	Total ARCO	...	48	...	2	2	90,541	51,988,762	
	Union Oil:								
	Attaka, 1972	4,200- 8,000	52	...	...	3	102,241	46,063,225	41.1
	Total Union Oil	...	52	...	...	3	102,241	46,063,225	
	Tesoro:								
	Tarakan, 1906	200- 2,400	23	172	102	1,107	5,189	197,833,349	20.0-21.0
	Sanga-Sanga, 1893	1,200	23	68	...	765	1,688	237,972,662	17.0-35.0
	Total Tesoro	...	46	240	102	1,872	6,877	435,806,011	
	A. A. R.								
	Bula, 1971	500-600	...	23	...	16	1,581	1,822,722	23.6
	Total A. A. R.	...	...	23	...	16	1,581	1,822,722	
	Petromer Trend:								
	Jaya, 1973	3,400	3	...	...	1	11,921	4,499,080	40 -42.1
	Kasim, 1972	4,050	5	...	...	2	13,209	3,474,339	31.3-40.2
	N. Kasim, 1973	5,400	1	1	...	2	13,090	2,369,134	27.4
	Total Petromer Trend	...	9	1	...	5	38,220	10,343,053	
	TOTAL INDONESIA	...	537	1,808	362	5,788	1,446,917	5,592,460,022	

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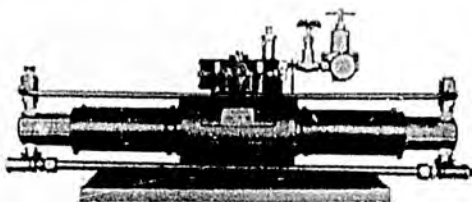
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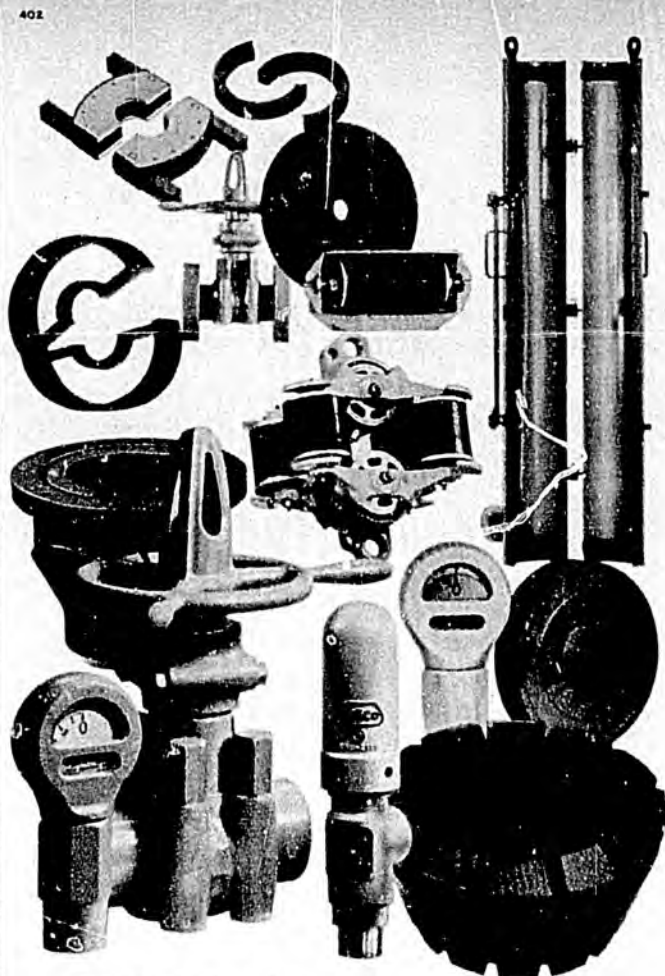
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WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API		
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74			
IRAN	Consortium-NIOC Fields										
	Agha Jari, 1933	6,500	50				1,009,693	5,723,172,000	33.9		
	Ahvaz-Bangestan, 1971	14,000	6				83,027	28,369,000	24.3		
	Ahvaz-Asmari, 1958	9,000	40				872,900	1,229,566,000	32.1		
	Bibi Hakimeh, 1961	6,800	18				361,866	1,050,000,000	29.8		
	Binak, 1959	11,600	1				56,103	101,579,000	30.0		
	Gach Saran, 1928	7,000	30				911,562	3,294,836,000	31.2		
	Haft Kel, 1927	3,500	11				35,238	1,665,240,000	36.6		
	Karani, 1963	7,800	8				316,481	478,075,000	33.8		
	Kharg Island, 1962	11,800	6				65,763	101,387,000	32.7		
	Kupal, 1965	14,000	2				20,796	13,965,000	32.1		
	Lab-e Safid, 1969	8,600	2				22,072	7,620,000	34.6		
	Mansuri, 1963	3,600	1				4,771	864,000	28.0		
	Marun, 1964	11,000	35				1,053,503	1,999,717,000	32.8		
	Masjid-e Suleiman, 1908	2,500	21				10,823	1,969,000	37.1		
	Naft Safid, 1935	6,000	12				33,469	259,465,000	35.7		
	Paris, 1964	5,700	12				422,916	555,901,000	33.9		
	Par-e Siah, 1967	6,000	1				7,411	13,106,000	37.4		
	Pazanan, 1961	9,000	6				34,293	133,379,000	35.5		
	Rag-e Safid, 1964	8,300	18				313,210	205,753,000	28.1		
	Ramshir, 1963	9,100	2				18,740	22,916,000	27.2		
		Total Consortium		282				5,654,637	17,972,879,000		
		Sirip Fields:									
		Bahrcgansar, 1960*	9,000-12,300	7				21,000	93,152,000	31.5	
		Hendijan, 1968*	9,950-11,000	5				22,000	28,605,000	31.5	
		Nowrouz, 1966*	8,587-10,850	10				32,000	40,267,000	20.9	
		Total Sirip *Offshore		22				75,000	162,224,000		
		IPAC Fields:									
		Cyrus, 1962*	1,000	7			6	24,448	42,896,898	18.9	
		Darius, 1961*	11,000	12			1	97,247	308,311,837	34.0	
		Total IPAC *Offshore		19			7	121,695	351,208,735		
		Iminoco Fields:									
		Rakhsh, 1969*	7,500-9,750	9	1		2	34,500	43,155,379	36.7	
	Rostam, 1966*	7,200-9,800	8	16		3	29,000	70,397,702	38.7		
	Total Iminoco *Offshore		17	17		5	63,500	113,553,081			
	Lapco Fields:										
	Sassan, 1966* *Offshore	7,500-8,100	14				195,000	102,556,000	34.1		
	NIOC Fields:										
	Naft Shah, 1923	2,000-3,000	7				18,000	58,512,000	43.0		
	Total Iran		361	17		12	6,127,832	18,760,932,816			
IRAQ	Ain Zalah, 1939	5,200-6,500	3			22	10,885	155,880,296	31.0		
	Bai Hassan, 1953	4,800-5,400	3			29	29,778	225,292,600	35.0		
	Jambur, 1954	5,500-11,500	2			16	3,036	63,399,017	35.0		
	Kirkuk, 1927	2,800-4,200	50			140	930,257	6,260,137,562	36.0		
	Naft Kaneh, 1909	3,500	2			17	11,500	108,367,500	42.5		
	Rumaila, 1953	10,800	30				620,600	1,912,343,000	35.0		
	Rumaila, North, 1958	10,500	30				121,800	80,600,740	34.0		
	Zubair, 1949	11,000	33				101,400	666,076,000	34.2		
	Others			3		10	nil	33,168,740			
	Total		153	3		234	1,829,256	9,505,327,455			
	JAPAN	Kubiki, 1954*	1,099- 6,370	122			7	830	10,560,910	31.0	
		Minami-Aga, 1964	7,278- 9,574	15			3	1,566	10,680,420	38.5	
		Sarukawa, 1958	1,914- 5,280	52	2		10	1,465	10,598,650	32.8	
Others			246	607		39	10,108	94,255,650			
Total *Offshore.			435	609		59	13,959	126,095,630			
KUWAIT	Ahmadi, 1953	4,800	78								
	Bahrah, 1956	8,500	2								
	Burgan, 1938	4,800	374								
	Magwa, 1951	4,800	99								
	Minagish, 1959	10,000	14								
	Raudhatain, 1955	8,500	49								
	Sabriyah, 1957	8,000	45								
	Umm Gudcir, 1962	9,300	31								
	Total		692				2,578,534	15,351,826,280			

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
LIBYA	Amal, 1959	9,900	...	...	100	19	104,248	470,117,625	36.0
	Arshad, 1966	10,100	1	...	...	6	551	6,450,538	48.0
	Bahi, 1968	3,600-3,750	...	40	...	1	84,299	162,979,114	43.4
	Beda, 1959	4,000	29	...	...	3	4,737	75,083,714	36.0
	Belhaden, 1962	7,200	4	...	...	3	2,120	27,798,631	33.7
	Bu-Alawn, 1972	6,000	2	...	...	...	8,992	5,245,790	40.0
	Bu-Attifel, 1968	14,300	20	...	...	5	126,205	86,112,611	41.2
	Dahra, 1959	3,100-3,700	6	39	...	91	30,704	362,269,654	37.0-41.0
	Defa, 1969	5,400-5,900	73	...	...	27	156,760	321,621,945	35.6
	Dor-Mansour Unit, 1967	5,800-6,400	1	4	...	2	4,066	17,826,824	32.2
	Ed Dib, 1970	3,500	...	3	...	1	281	2,896,921	38.0
	Elgiza, 1967	5,100	1	...	...	...	233	331,777	39.0
	Farigh, 1969	12,000	3	...	...	1	143	4,123,007	39.0
	Farrud, 1965	3,200	...	...	6	3	2,073	16,524,144	42.0
	Gialo, 1961	2,200-6,300	4	157	...	41	203,072	1,089,858,569	35.7
	Intisar A, 1967	9,750	14	...	...	5	73,642	478,010,371	45.0
	Intisar B, 1974*	9,600	...	...	...	2	...	...	51.0
	Intisar C, 1967	9,650	4	...	...	3	36,725	57,536,476	37.0
	Intisar D, 1967	9,400	15	...	...	1	203,697	496,105,819	39.5
	Intisar E, 1968**	5,300-7,100	...	...	...	2	...	...	24.0-39.0
	Intisar L, 1969**	7,800-8,900	...	...	...	1	...	...	24.0-35.0
	*On production 1974. **On production 1975.								
	Jebel, 1962	8,100	18	...	...	16	23,394	103,716,669	37.0
	Kotla, 1963	5,500	6	...	...	2	6,742	36,802,175	34.0
	Lehib, 1966	9,100	...	...	...	14	10	29,589,370	49.0
	Majid, 1968	9,600-9,800	6	...	...	1	9,657	23,738,262	40.5
	Nafoora, 1965†	2,200-10,000	82	...	...	6	114,289	529,228,044	36.0
	Ora, 1962	4,700-7,500	...	1	...	1	3,547	61,922,484	37.0
	Ora AA, 1973	4,700-7,500	3	16	...	13	438	76,946	36.0
	Ora BB, 1974	8,082	1	...	...	...	1,133	205,048	37.0
	Nasser (Zelten), 1959**	5,500-7,000	44	...	83	65	163,884	1,674,885,524	40.0
	Raguba, 1961	5,400	45	...	...	27	70,423	402,113,159	43.0
	Rakb, 1962	2,600-9,000	3	7	...	1	7,049	23,067,023	34.0
	Ralah, 1964	7,650	2	...	...	2	1,729	6,248,304	37.0
	Sahabi, 1968	10,300	2	5	...	2	4,263	14,514,527	39.0
	Sarir, 1961	9,000	68	...	...	25	162,609	783,109,159	37.2
	Samah, 1961	9,000	11	...	...	9	203,072	231,474,052	33.4
	Umm Farud, 1965	3,200	...	5	...	3	1,805	15,944,591	46.5
	Waha, 1960	6,600	...	50	...	16	118,199	516,833,784	36.1
	Zaggut, 1962	6,000	4	...	...	4	2,489	16,681,342	36.4
	Zelten (see Nasser)	...	...	...	...	...	...	...	...
	Others	...	1	1	...	83	...	97,847,123	...
Total Libya			462	328	189	507	1,937,280	8,250,894,116	...

*Unitized with Augila. **Name change in 1974.

MEXICO	Poza Rica, Central Zone								
	Atún, 1966†	9,040	8	...	...	...	4,938	27,852,560	37.0
	Bagre, 1973	10,919	5	...	...	...	5,307	1,259,361	...
	A. Camacho, 1952	5,340	2	...	8	...	390	2,445,526	35.0
	Cerro Carbon, 1960	9,396	1	...	14	...	721	2,857,055	...
	Hallazgo, 1955	10,170	...	...	52	...	5,342	56,683,646	25.0
	Jiliapa, 1958	7,390	2	...	32	...	2,102	22,858,897	34.0
	Miquetla, 1959	6,480	5	...	29	...	1,929	16,817,266	35.0
	Morsa, 1971	10,434	3	...	...	...	4,367	8,334,585	37.0
	Nvo. Progreso, 1955	7,185	1	...	9	...	625	6,575,349	31.0
	Poza Rica, 1930	7,090	22	...	116	...	55,874	1,062,515,052	35.0
	Remolino, 1962	10,745	...	...	32	...	2,254	15,285,703	...
	Riachuelo, 1972	10,798	3	...	...	...	1,847	988,595	...
	Sn. Andrés, 1956	10,410	5	...	137	...	30,634	241,954,825	29.0
	Others	...	68	18	180	...	2,949	35,080,706	...
	Nueva Faja de Oro, Central Zone								
	Acuatempa, 1955	4,085	14	...	...	...	1,676	22,357,159	21.0
	Alamo-Jardín P. Real	...	26	...	...	...	531	21,857,462	...
	Copal, 1957	4,610	13	...	...	...	775	1,153,343	15.0
	El Muro, 1966	3,966	9	...	...	...	4,189	9,247,024	17.0
	E. Ordóñez, 1952	5,220	10	...	...	...	2,704	51,301,534	21.0
	Mesa Cerrada, 1956	4,085	6	...	...	...	455	10,362,915	22.0
	Ocotepc, 1953	3,737	11	...	...	...	809	17,500,602	20.0
	Sta. Agueda, 1953	4,789	29	...	...	...	6,549	90,473,621	16.0
	Others	...	35	...	...	...	846	17,051,875	...
	Veracruz District, Central Zone								
	Angostura, 1953	4,405	8	...	...	...	463	21,545,836	15.0
	Matapionche, 1974	11,129	1	...	...	...	420	76,106	37.0
	Others	...	2	...	...	...	203	276,839	...
	Isthmus of Tehuantepec, Southern Zone								
	Agata, 1956	3,830	2	...	11	...	653	9,459,411	34.0
	Cuichapa, 1935	2,200	106	5	39	...	70,090	66,638,325	30.0
	El Burro, 1931	2,200	...	15	6	...	1,256	17,317,962	26.0
	El Plan, 1931	1,700	...	27	49	...	4,142	140,398,906	30.0
	Ixhuatl' Ote., 1965	3,952	11	4	...	...	1,366	4,134,584	22.0
	Los Soldados, 1953	4,492	12	...	10	...	2,541	18,378,141	32.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow-ing	Pump-ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
MEXICO—Continued	Moloacán, 1948	1,397	3	118	20	...	3,412	6,513,130	26.0
	Tonalá, 1928	1,770	3	19	13	...	1,387	71,920,815	28.0
	Others	...	14	19	1	...	978	51,484,229	...
	Tabasco, Southern Zone	...	...	...	...	...	...	...	...
	Ayapa, 1973	8,200	5	...	...	...	2,165	63,673	...
	Blasillo, 1967	7,216	2	...	7	...	574	2,166,136	40.0
	Cactus, 1972	12,333	17	...	...	...	30,474	10,709,900	41.0
	Caracolillo, 1969	11,480	5	...	...	...	1,073	2,124,979	...
	Carrizo, 1962	4,820	3	...	10	...	1,760	6,758,641	25.0
	Castarrical, 1967	10,086	9	...	38	...	10,773	21,964,406	34.0
	Cinco Pdtes., 1960	6,862	39	...	92	...	27,444	187,537,807	35.0
	El Golpe, 1963	8,836	23	...	58	...	14,753	44,354,764	35.0
	La Venta, 1954	4,730	1	2	40	...	3,375	44,833,686	41.0
	Northeastern District, Northern Zone	...	...	...	...	...	...	...	...
	Fco. Cano, 1949	5,780	4	...	1	...	321	4,456,456	48.0
	Monterrey, 1950	6,950	4	...	15	...	2,106	9,772,370	47.0
	Tigrillo, 1971	9,844	6	...	6	...	738	648,930	55.0
	Others	...	5	...	1	...	174	14,361,000	...
	Northern District, Northern Zone	...	...	...	...	...	...	...	...
	Arenque, 1970†	11,362	11	...	...	...	22,286	14,476,930	26.0
	Barcodón, 1959	4,370	7	1	...	...	233	8,489,636	17.0
	Constituciones, 1956	6,300	45	...	43	...	6,521	42,777,280	17.0
	Ebano-Pánuco, 1901	1,450	174	124	169	...	7,124	928,232,465	12.0
	Tamaulipas, 1956	4,200	68	...	44	...	8,914	39,838,517	18.0
	Others	...	...	...	...	...	...	24,481,837	...
	Southern District, Northern Zone	...	...	...	...	...	...	...	...
	Cabo Nuevo, 1967*	5,753	2	...	...	...	1,111	10,292,296	16.0
	Isla de Lobos, 1963†	6,875	3	...	...	...	3,790	17,171,381	40.0
	Moralillo, 1948	5,270	18	...	...	...	586	12,731,752	21.0
	Naranjos-C-A, 1909	1,800	32	...	...	...	7,322	1,151,913,697	20.0
	Pontón, 1971	4,248	2	...	...	...	165	116,163	30.0
	Rancho Nuevo, 1960	6,435	4	...	...	...	228	1,976,135	28.0
	Soledad, 1973	5,222	16	...	...	...	292	54,485	...
	Solis, 1952	2,445	28	...	...	...	324	7,648,658	22.0
	Tiburón, 1965†	7,314	5	...	...	...	1,100	5,226,176	20.0
	Tres. Hnos., 1959	5,960	43	...	...	...	9,466	87,520,585	21.0
	Others	...	109	...	...	...	46	5,982,717	...
	Southern District, Southern Zone	...	...	...	...	...	...	...	...
	Magallanes, 1957	4,240	11	1	151	...	14,640	97,894,473	27.0
	Mecoacán, 1958	7,110	16	...	15	...	3,763	28,320,250	27.0
	Ogarrio, 1957	5,790	56	...	50	...	17,763	82,871,715	38.0
	Otates, 1965	7,469	13	...	6	...	4,993	15,712,718	39.0
	Pajonal, 1967	9,840	2	...	9	...	2,141	2,689,284	27.0
	Rodador, 1971	11,398	1	...	1	...	539	179,705	26.0
	Sabancu, 1973	12,169	1	...	...	...	1,498	440,162	21.0
	Samaria (Cret), 1973	14,209	5	...	...	...	12,160	3,506,364	31.0
	Samaria (Terciario), 1960	2,624	2	...	13	...	1,470	4,434,585	23.0
	San Ramón, 1967	9,883	9	...	48	...	18,020	25,548,239	30.0
	Sra. Ana, 1959*	9,517	1	...	10	...	1,400	29,188,629	29.0
	Santuario, 1966	9,617	21	...	...	...	7,234	8,807,672	37.0
	Sitio Grande, 1972	13,766	15	...	...	...	65,979	16,303,422	35.0
	Tintal, 1968	5,904	6	...	...	...	815	2,049,666	22.0
	Tucán, 1968	10,824	1	...	10	...	1,637	4,831,151	36.0
	Tupilco, 1955	9,685	18	...	26	...	8,729	26,821,406	27.0
	Others	...	10	...	2	...	805	8,321,981	...
	Total Mexico	...	1,318	353	1,623	...	513,548	5,218,204,025	...
*Partly offshore. †Offshore.									
MOROCCO	Haricha, 1957	3,000	1	...	...	...	12	2,754,380	40.0
	Sidi Fili, 1947	3,000	18	2	...	...	80	7,549,200	40.0
	Sidi Rhalem, 1961	5,600	...	1	...	...	800	5,435,000	40.0
	Total	...	19	3	...	...	892	15,738,580	...
NETHERLANDS	De Lier-Monster, 1955	5,200	...	27	...	4	912	12,731,073	33.2
	IJsselmonde/Ridderkerk, 1956	5,000	...	46	...	11	6,254	63,119,533	18.0-24.2
	Schoonebeek, 1943	2,500	...	213	...	97	14,899	161,982,701	24.8
	Wassenaar-Meyendel, 1956	4,200	...	29	...	2	4,062	32,686,737	18.6
	Zoetermeer, 1957	3,200	...	14	...	4	750	6,781,252	16.4
	Others	...	...	18	...	23	514	8,561,606	...
	Total	...	...	347	...	132	27,391	285,862,902	...
NEUTRAL ZONE	Hout, 1969*	4,500-9,500	26	...	...	...	41,285	109,117,322	34.0
	Khafji, 1961*	4,500-9,500	101	...	...	...	292,611	1,172,039,432	28.4
	So. Fuwaris, 1962	6,300	...	3	...	5	2,345	11,334,034	24.5
	So. Umm Gudair, 1966	9,100	9	7	...	1	52,343	105,576,540	24.3
	Wafra	...	...	...	...	...	...	...	...
	Burgan, 1953	3,600	9	38	...	8	21,030	187,850,367	24.0
	Eocene, 1954	2,200	5	215	...	95	18,917	350,326,592	18.5
	Ratawi, 1955	7,000	3	33	...	3	56,842	290,773,449	24.3
	Total	...	153	296	...	112	485,347	2,227,011,736	...
*Offshore.									

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
NEW ZEALAND	Kapuni, 1959	11,300-12,500	4	...	...	...	13,780	4,357,500	49.0
	Others	...	...	...	...	...	...	217,000	...
	Total	...	4	...	...	...	3,780	4,574,500	...
	*Condensate. Note: Offshore Maui field not yet on production.								
NIGERIA	Gulf Oil								
	Abiteye, 1970	5,750- 9,400	8	...	...	2	9,248	6,934,793	38.2
	Delta, 1965*	5,600- 9,400	17	...	...	2	37,634	44,435,338	27.9
	Delta South, 1965*	7,100- 9,200	16	...	...	3	54,084	103,501,132	38.1
	Isan, 1970*	5,800- 9,000	11	...	...	...	15,948	15,213,726	39.3
	Malu, 1969*	4,800- 6,300	15	...	...	...	18,838	28,199,249	39.2
	Meji, 1965*	5,200-10,900	16	...	...	...	22,667	38,584,255	32.6
	Meren, 1965*	5,000- 7,500	47	...	...	2	126,044	175,341,136	32.3
	Okan, 1964*	5,500- 8,900	42	...	...	4	72,395	205,723,519	34.9
	Parabe/Eko, 1968*	4,500- 8,200	23	...	...	2	32,518	42,547,183	37.0
	Mobil Oil								
	Asabo, 1966*	5,412	11	...	...	2	42,300	54,807,484	34.0
	Ekpe, 1966*	7,503	7	...	...	1	69,300	58,791,081	39.0
	Etim, 1968*	6,147	7	...	...	...	33,300	16,267,771	38.0
	Enang, 1968*	5,250	9	...	...	2	1,751	315,175	34.0
	Idoho, 1966*	8,536	3	...	...	1	5,480	18,211,373	40.0
	Inim, 1966*	5,914	7	...	...	...	44,100	29,769,407	37.0
	Ubit, 1968*	4,842	17	...	...	4	23,100	39,620,998	36.0
	Unam, 1968*	5,000	4	...	...	...	13,900	530,267	36.0
	Utue, 1966*	5,914	5	...	...	1	22,200	15,141,197	38.0
	Agip-Phillips (estimated)								
	Akri, 1973	8,000-10,000	8	...	...	...	16,569	n.a.	44.4
	Ebocha, 1965	9,200-10,100	21	...	...	...	39,173	48,728,741	42.3
	Idu, 1973	8,000-10,000	7	...	...	...	9,097	5,143,478	30.9
	Mbede, 1966	9,850-10,800	24	...	...	...	49,909	48,545,639	43.2
	Ofiafu/Obrikom, 1973	8,000-10,000	16	...	...	...	29,912	10,918,026	44.5
	Obigbo, 1969	...	1	...	...	...	926	338,000	38.1
	Obigbo N., 1969	...	14	...	...	...	19,580	7,146,046	23.4
	Odugri, 1972	12,500	2	...	...	...	832	303,500	44.8
	Elf-Nigeria (ex Safrap)								
	Aghigho, 1972	6,000- 8,500	5	...	...	1	3,120	597,283	26.0
	Erema, 1972	9,800	1	...	...	1	416	24,946	35.0
	Obagi, 1964	1,000-10,000	26	...	...	4	63,835	74,961,418	24.0
	Odobo-Jatumi, 1966	6,000-11,000	5	...	...	2	7,333	1,770,871	35.0
	Okpoko, 1967	6,000- 7,500	3	...	...	...	5,892	1,355,367	22.0
	Upomami, 1965	6,000- 7,000	6	...	...	3	4,357	1,086,152	20.0
	Texaco-Chevron								
	Pennington, 1964*†	5,000-12,000	3	...	...	...	4,110	12,182,279	37.9
	†Field shut in May 8, 1974, by government order. Production to resume in 1975.								
	Shell-British Petroleum (Midwest)								
	Ugh-Ogini, 1964	5,860	7	...	...	2	4,873	6,291,890	17.5
	Ugh-Uzere East, 1960	8,500	13	...	...	...	18,467	41,887,333	22.6
	Ugh-Uzere West, 1960	8,500	10	...	...	1	17,378	58,836,870	27.7
	Ugh-Olomoro, 1963	7,000-10,000	21	...	...	10	42,279	160,063,745	22.3
	Ugh-Oweh, 1964	12,300	11	...	...	...	13,221	58,798,402	26.8
	Ugh-Kokori, 1961	8,000- 9,800	20	...	...	2	73,217	160,741,361	44.9
	Ugh-Afiesere, 1966	8,000- 9,000	20	...	...	1	18,706	32,192,357	23.8
	Ugh-Eriemu, 1961	12,550	9	...	...	2	7,007	11,507,010	29.9
	Ugh-Ughelli E., 1959	11,800	7	...	...	1	21,373	52,220,488	33.6
	Ugh-Ughelli W., 1959	7,400-10,200	6	...	...	...	6,622	14,125,498	20.0
	Ugh-Utorogu, 1964	9,000	18	...	...	1	39,861	70,337,190	25.0
	Ugh-Oroni, 1964	12,000	6	...	...	1	6,878	10,716,902	19.0
	Ugh-Warri R., 1961	12,264	3	...	...	...	4,232	4,834,250	30.8
	Ugh-Evwreni, 1967	10,900	6	...	...	3	8,053	18,830,552	25.0
	Ugh-Rapele, 1965	12,934	3	...	...	...	9,408	8,753,470	25.0
	Ugh-Osioka, 1967	12,885	2	...	...	...	1,985	2,601,353	30.0
	Forc-Jonas Cr., 1967	7,000- 9,000	28	...	...	1	126,933	160,616,935	25.0
	Forc-Odidi, 1967	10,980	19	...	...	1	58,437	38,488,800	30.0
	Forc-Egwa, 1967	9,350	15	...	...	...	28,246	32,367,979	37.0
	Forc-Yokri, 1971	10,859	2	...	...	...	2,496	523,317	24.3
	Forc-Estuary, 1969	7,000	51	...	...	1	132,500	134,037,504	25.0
	Forc-Batan, 1968	11,000	7	...	...	...	16,948	13,847,735	21.0
	Forc-Escravos Beach, 1969	9,391	8	...	...	...	13,128	9,396,840	36.0
	Forc-Ajuju, 1970	13,324	1	...	...	...	3,545	2,769,310	30.0
	Forc-Otumara, 1970	8,176	15	...	...	1	41,283	20,810,236	30.0
	Forc-Saghara, 1970	8,950	3	...	...	...	7,107	4,027,044	30.0
	Node-Sapele, 1970	12,788	10	...	...	1	45,165	20,854,110	41.0
	Node-Amukpe, 1970	12,378	2	...	...	...	6,863	4,682,011	41.0
	Node-Oben N., 1973	10,016	1	...	...	...	71	12,893	30.0
	Node-Oben, 1972	12,036	2	...	...	...	1,274	230,684	30.0
	Others	...	...	...	...	...	57	261,514	...
	Shell-British Petroleum (Eastern)								
	Phi-Bomu, 1968	6,700- 7,500	27	...	...	4	34,964	241,018,633	33.2
	Phi-Isimiri, 1964	5,900-11,000	5	...	...	...	6,533	17,073,605	28.8
	Phi-Imo R., 1959	5,800-10,100	37	...	...	3	72,437	244,172,825	32.0
	Phi-Ebubu, 1958	8,200	6	...	...	2	2,359	13,303,428	26.0
	Phi-Onne, 1965	10,384	2	...	...	...	1,830	2,281,468	20.0
	Phi-Nkali, 1963	12,000	5	...	...	1	3,647	13,355,420	41.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Shut in	Production in bbl		Gravity °API
			Flow-ing	Pump-ing	Gas Lift		Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
NIGERIA—Continued	Phl-Obigbo N., 1963	6,500-10,000	16	...	...	3	20,780	80,982,506	24.2
	Phl-Obigbo, 1963	...	1	...	...	1	951	210,086	30.0
	Phl-Elelenwa, 1959	11,000	6	...	...	...	8,368	8,937,748	38.0
	Phl-Agbada, 1960	8,000-12,000	26	...	...	2	28,942	65,425,100	32.1
	Phl-Umuechem, 1959	5,500-10,700	15	...	...	...	16,624	97,494,795	37.6
	Phl-Apara, 1960	9,000	5	...	...	1	1,965	5,415,138	34.0
	Phl-Obele, 1964	10,000	3	...	...	7	767	1,826,971	22.0
	Phl-Bodo W., 1962	9,700	9	...	...	1	18,615	40,833,020	22.5
	Phl-Afam, 1956	6,000	11	...	...	2	11,337	22,999,177	45.0
	Phl-Korokoro, 1969	8,000- 9,800	7	...	...	1	13,325	56,898,741	35.2
	Phl-Yorla, 1970	11,917	13	...	...	...	32,144	16,986,040	30.0
	Phs-Alakiri, 1962	10,000	10	...	...	5	17,250	38,029,467	32.5
	Phs-Bonny, 1959	12,254	10	...	...	1	19,199	6,237,242	30.4
	Phs-Buguma Cr., 1960	12,195	6	...	...	...	10,871	6,679,915	35.0
	Phs-Cawth. Channel, 1963	11,000	10	...	...	2	46,894	97,632,450	39.0
	Phs-Ekulama, 1958	10,483	11	...	...	...	24,838	12,425,479	20.2
	Phs-Krakama, 1958	11,530	5	...	...	...	6,075	4,251,037	38.0
	Phs-Soku, 1958	11,500	22	...	...	...	41,004	32,365,903	35.0
	Phs-Oloibiri, 1956	8,000- 9,800	6	...	...	5	3,006	17,445,343	22.0
	Egb-Oguta, 1965	10,300	16	...	...	...	30,377	35,389,412	30.0
	Egb-Assa, 1961	11,300	2	...	...	...	970	1,033,503	17.5
	Egb-Egbema, 1960	10,470	6	...	...	...	11,978	22,618,410	28.0
	Egb-Ahia, 1965	11,500	12	...	...	1	20,611	44,614,750	35.5
	Cesw-Nun R., 1974	...	5	...	...	...	9,435	2,106,429	37.0
	Cesw-Diebu Cr., 1974	...	8	...	...	...	21,630	1,190,956	30.0
	Cesw-Adibawa, 1966	11,950	8	...	...	...	14,368	56,878	30.0
	Cesw-Ubie, 1970	14,380	4	...	...	...	7,516	2,625,824	3.00
	Cesw-Etebebu, 1971	12,000	6	...	...	...	23,232	6,700,680	30.0
	Cesw-Kolo Cr., 1974	12,000	14	...	...	...	33,710	9,532,919	30.0
	Others	...	...	...	...	...	...	181,470	...
	Total Nigeria	...	1,088	...	...	103	2,296,035	3,544,936,991	...
NORWAY	Ekofisk, 1970* *Offshore	10,200-10,900	6	...	...	...	25,000	28,717,062	36.5
OMAN	Fahud-Natih, 1964	2,000- 6,080	56	...	...	21	112,566	396,109,520	32.5
	Huwaisa-Shuaiba, 1970	5,550	20	...	...	...	42,500	44,284,651	33.0
	Natih-Natih, 1962	7,500	23	...	...	7	48,841	185,267,598	31.3
	Yibal-Shuaiba, 1962	8,465	61	...	...	2	92,998	97,460,164	39.7
	Total	...	160	...	...	30	296,905	723,121,933	...
PAKISTAN	Balkassar, 1946	8,200	3	1	...	...	1,761	19,980,993	24.3
	Dhulian, 1937	8,500	5	1	1	...	1,917	36,783,716	43.0
	Joya Mair, 1944	6,890	1	...	...	...	328	3,874,614	16.0
	Meyal, 1968	12,500	2	...	...	...	2,467	4,229,191	44.0
	Toot, 1968	13,600	2	...	...	...	590	1,240,207	35.2-37.5
	Total	...	10	4	2	...	7,063	66,108,721	...
PERU	COASTAL	...	...	...	...	...	...	...	...
	Talara Area, 1869-1943†	2,000- 9,000	90	1,104	...	4,200	11,100	534,269,000	25.0-40.0
	Lima Concessions, 1905	2,000- 9,000	54	900	...	1,138	23,000	160,527,000	32.0-35.0
	Others	500- 1,500	...	...	...	21	...	110,901,902	...
	ORIENTE	...	...	...	...	...	...	...	...
	Agua Caliente, 1939	1,000- 1,500	...	22	...	8	600	13,090,303	34.0
	Maquia, 1957	1,000- 1,500	6	6	...	2	1,050	6,608,585	37.0
	CONTINENTAL SHELF	...	...	...	...	...	...	...	...
	Humboldt, 1960*	3,000- 7,500	45	68	...	17	29,750	38,161,750	38.0
	Litoral & Mirador, 1955*	1,500- 6,000	...	98	...	12	3,200	25,506,063	37.0-40.0
	Providencia, 1967	3,000- 6,000	...	18	...	22	950	9,451,253	38.0-40.0
	Others	...	1	...	...	2	50	549,000	...
	SIERRA	...	...	...	...	...	...	...	...
	Pirin, 1906	...	...	...	...	...	...	287,000	...
	Total	...	196	2,216	...	5,422	69,700	899,351,856	...
	*Offshore	...	...	...	...	...	...	...	...
	†Includes La Brea y Parinas, Los Organos, and PDP-Belco.	...	...	...	...	...	...	...	...
QATAR	Bul Hanine, 1970*	6,000	5	...	...	...	138,463	94,609,357	35.0
	Dukhan, 1940	6,550	56	...	...	4	251,000	1,460,050,000	41.1
	Idd El Shargi, 1960*	4,500- 8,250	10	...	...	4	24,088	140,572,915	35.5
	Mayden-Mahzan, 1963*	7,000- 7,600	10	...	...	1	132,518	376,634,216	38.0
	Total	...	81	...	...	9	546,069	2,071,866,488	...
	*Offshore.	...	...	...	...	...	...	...	...
SAUDI ARABIA	Abqaiq, 1940	6,670	64	...	...	2	870,659	4,629,594,964	38
	Abu Hadriyah, 1940*	9,930	9	...	...	3	102,105	280,909,047	35
	Abu Sa'fah, 1963*	6,650	10	...	...	6	121,479	255,863,778	38
	Berri, 1964†	7,450	42	...	...	6	639,517	609,627,402	33-38
	Dammam, 1938	4,620	18	...	...	...	17,793	534,855,162	34
	Fadhli, 1949	8,110	4	...	...	2	49,281	148,204,174	40
	Ghawar, 1948	6,700	378	...	...	70	4,653,452	9,958,791,384	35
	Harmaliyah, 1971	8,400	6	...	...	...	129,877	38,979,403	36
	...	...	...	...	...	...	...	...	...

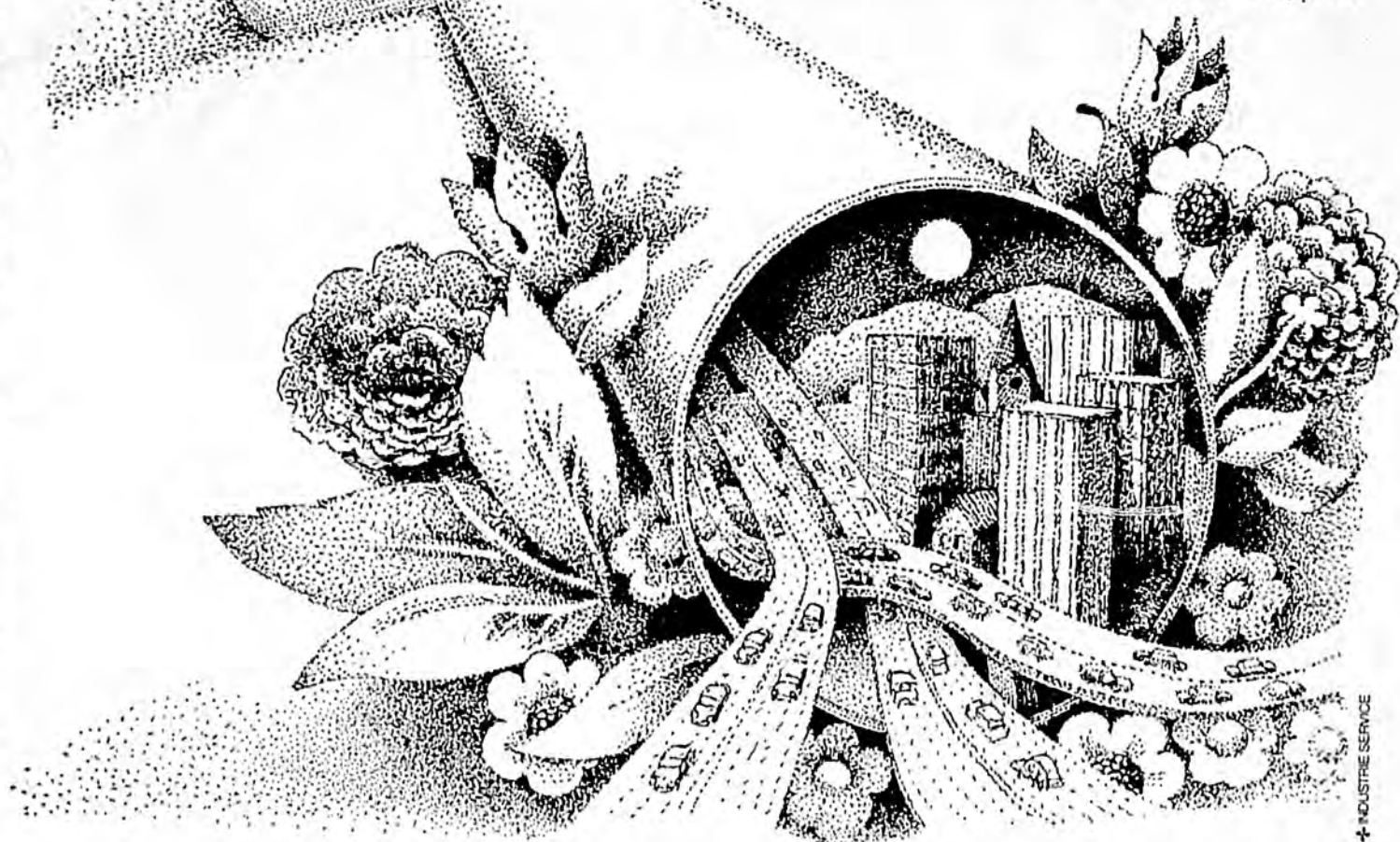
WORLDWIDE PRODUCTION	discovery date Name of field and	(ft) Depth	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
SAUDI ARABIA—Continued	Khurais, 1957	5,100	8	...	...	1	23,594	45,736,418	33
	Khursaniyah, 1956	6,750	11	...	...	...	115,372	451,365,249	31
	Maharah, 1973*	7,000	...	...	...	1	...	...	34
	Manifa, 1957*	7,950	6	...	...	2	34,861	117,816,263	28
	Marjan, 1966*	5,200	1	...	...	6	1,894	632,396	32
	Mazaliij, 1971	6,200	...	...	...	3	...	...	31
	Qatif, 1945†	7,050	19	...	...	4	93,656	432,287,561	31
	Qirdi, 1973	5,300	...	...	...	1	...	...	38
	Safaniyah, 1951†	5,100	83	...	...	13	1,019,123	2,841,434,660	27
	Shaybah, 1968	5,000	...	...	...	7	...	9,870	42
	Zuluf, 1965*	5,800	11	...	...	1	193,446	87,645,208	32
	Karan, 1967*	5,500	...	...	...	1	...	...	22
	Jana, 1967*	7,400	...	...	...	2	...	...	35
	Juraybiat, 1968	7,600	...	...	...	1	...	...	29
	Rimthan, 1974	10,000	...	...	...	1	...	...	28-38
	Ramlah, 1974	9,500	...	...	...	1	...	...	33
	Total			670	...	...	134	8,066,109	20,433,743,938
*Offshore. †Partly offshore.									
SHARJAH									
	Mubarek, 1972	12,650-12,870	3	...	...	...	(*)	(*) 39.5-40.3	
*Note: field went on production in July, 1974 at 50,000-60,000 b/d.									
SPAIN	Ayoluengo, 1964	4,000	...	21	...	5	1,805	7,394,800	37.0
	Amposta Marina, 1971*	10,000	3	...	...	1	35,625	10,763,466	37.0
	Total		3	21	...	6	37,430	18,158,266	
†Offshore.									
SYRIA†	Hamsch, 1956	6,000	...	...	...	1	...	...	21.0
	Jibissa, 1968	6,000	...	...	...	1	...	...	23.0
	Karatchouk, 1956	6,500	13	3	...	1	20,000	...	23.0
	Rumalan, 1956	6,500	4	...	...	1	10,000	216,300,000	25.0
	Souedie, 1959	6,500	80	23	...	31	125,000	...	25.0
	Total		97	26	...	35	155,000	216,300,000	
†Data estimated.									
THAILAND	Boh Ton Kham (Chai Prakarn), 1953	700	...	12	...	12	14	202,000	16.0-17.0
	Mae Soon Luang, 1963	2,000-2,500	1	12	...	5	184	454,100	32.0
	Total		1	24	...	17	198	656,300	
TRINIDAD & TOBAGO									
Area 1									
North Marine, 1959*	3,000-15,000	1	...	...	7	99	1,221	23.2	
Soldado, 1955*	2,150-11,000	131	21	88	83	51,323	262,819	24.8	
Area 2									
Area IV + Guapo, 1913-1922	1,000-10,626	1	35	...	110	474	32,767	16.9-25.5	
Parrylands, 1913-1918		14	42	...	150	886	33,828	10.7-30.2	
Pt. Fortin Central & West, 1907-1916		18	33	...	136	773	29,846	20.4-45.1	
Area 3									
Brighton, 1908†	700-7,500	41	31	71	286	2,783	66,524	32.8	
Area 4									
Palo Seco, 1926-1929	240-12,718	...	6	...	63	23	1,583	22.1	
Palo Seco Erin, 1915-1926		65	277	105	417	9,746	76,953	21.2	
Area 5									
Forest Reserve, 1913	500-11,000	34	268	270	1,097	11,506	231,581	23.0	
Fyzabad, 1918-1920		15	213	14	325	3,954	151,196	20.8-32.7	
Pt. Fortin East, 1929		4	39	12	47	1,680	21,365	34.4	
Area 6									
Coora-Quarry, 1936	288-14,000	9	99	66	352	3,109	78,940	20.4-24.1	
Area 7									
Oropouche, 1944		13	17	6	33	2,007	3,920	19.8-38.6	
Area 8									
Barrackpore, 1911	1,300-11,067	12	13	23	143	1,653	23,324	26.9-41.2	
Penal, 1936		29	47	9	87	1,954	55,864	37.5-55.7	
Wilson, 1936		4	25	4	37	364	18,719	26.4	
Area 9									
Catshill, 1950		2	46	...	28	831	20,251	38.3-46.3	
Moruga North, West, 1956		1	30	...	73	335	9,216	25.0-31.4	
Trinity, 1956		1	13	17	40	491	12,992	32.2	
Area 10									
Guayaguayare, 1903	500-10,750	10	155	59	321	5,943	72,996	33.7	
Area 11									
Galeota, 1972*	1,100-6,304	...	15	...	3	1,333	1,231	31.6	
Teak, 1972*	6,960-15,191	28	...	...	11	49,923	33,084	29.3	
Samaan, 1973*	8,719-11,780	14	...	...	1	23,841	10,131	36.8	
Others	3,000-7,560	70	236	38	1,020	6,219	188,891	14.1-40.7	
Trinidad & Tobago Total		517	1,661	782	4,870	181,250	1,439,242		
*Offshore. †Partly offshore.									

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells				Production in bbl		Gravity °API
			Flow- ing	Pump- ing	Gas Lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
TUNISIA†	AQUITAINE								
	Ashtart, 1971*	9,450- 9,700	6	...	...	...	12,442	1,231,721	29.0
	Douleb, 1966	3,300	...	11	...	2	5,071	9,568,527	40.2
	Tamesmida, 1968	4,950	...	2	...	1	364	818,708	35.4
	ENI (Sitep)								
	El Borma, 1964	8,250- 8,900	35	...	...	15	52,300	198,080,058	42.5
	CFP								
	Sidi el Itayem, 1971	9,232	4	...	...	...	3,870	4,278,000	40.0
	TOTAL		45	13	...	18	74,047	213,997,014	
	†Some data estimated. *Offshore; production began Dec., 1973.								

TURKEY	Ersan:								
	Kahta, 1958	3,500	...	5	...	1	721	3,446,651	11.5
	Mobil:								
	Bulgurdag, 1960	6,500	...	1	...	2	102	2,203,000	39.0
	Selmo, 1964	5,800	2	10	2	2	8,542	36,286,785	34.4
	Shell:								
	Barbes, 1972	7,200	6	...	...	1	4,897	3,310,512	29.6
	Beykan, 1964	5,200	13	...	...	4	11,039	36,323,667	33.2
	Katin, 1971	6,800	2	...	...	1	1,767	1,497,369	29.5
	Kayakoy, 1961	6,000	5	...	...	2	1,934	8,285,208	38.2
	Kayakoy West, 1964	5,300	4	...	...	3	3,341	11,959,801	34.0
	Kurkan, 1963	4,500	8	...	...	1	9,435	28,201,015	31.4
	Malatepe, 1970	5,000	4	...	...	1	867	2,251,492	32.7
	Malatepe W., ?	...	...	...	...	...	859	...	31.3
	Piyanko, 1968	6,300	1	...	...	...	279	938,726	35.5
	Sahaban-Kurkan So., 1967	5,500	6	...	...	...	2,153	10,752,171	34.7
	Others	....	2	...	...	...	176	43,357	...
	TPAO:†								
	Adiyaman, 1971	5,600	...	12	...	2	2,745	2,585,590	26.6
	Garzan-Germik, 1951	5,100	...	38	...	32	2,974	26,346,869	25.0
	Magrip, 1961	6,400	...	13	...	12	1,161	11,212,275	19.3
	Raman, 1940	4,500	...	24	...	23	3,005	21,460,854	18.5
	Raman West, 1961	4,300	...	126	...	12	4,689	18,960,191	13.4
	Saricak, 1973	...	4	...	...	...	2,100	765,000	31.5
	Silivanka, 1962	7,500	...	14	...	1	1,547	3,244,058	19.6
	Yenikoy, 1973	...	8	...	...	...	551	200,000	31.0
	Others	....	...	6	...	...	412	2,784,625	...
	Total Turkey		65	249	2	100	65,296	233,059,216	
	†Data estimated.								

UNITED KINGDOM	Beckingham, 1964	3,200- 6,600	...	8	...	...	442	415,327	...
	Bothamsall, 1958	3,300	...	6	...	7	224	2,024,707	...
	Egmont, 1955	3,250	...	8	...	35	148	2,996,303	...
	Gainsborough, 1959	3,200- 4,600	...	25	...	17	502	2,431,270	...
	Kimmeridge, 1959	1,800	...	9	...	5	184	9,959,536	...
	Total		...	56	...	64	1,500	17,827,143	

VENEZUELA*	STATE OF ANZOATEGUI								
	Araibei, 1954	8,970-10,516	6	...	...	30	1,319	26,189,621	38.7
	Boca, 1951	9,500	10	10	...	60	3,238	69,270,383	35.4
	Caico Seco, 1946	6,500- 7,300	13	6	...	61	4,890	44,814,504	35.5
	Chimire, 1948-52	7,000- 7,200	35	34	...	135	11,373	339,788,339	34.9
	Dacion, 1957	6,700	12	79	...	30	10,724	170,413,260	34.2
	Elias, 1954	5,000- 6,470	43	16	...	64	24,368	68,141,820	41.1
	El Rob'e, 1939	3,500-11,500	13	1	...	31	920	36,523,800	49.5
	Guara, 1946	5,000-10,000	24	158	...	200	22,465	490,605,725	27.3
	Guaria, 1940	5,000-10,000	3	...	...	27	2,326	43,614,990	50.2
	Guico, 1944	4,500- 7,000	2	29	...	48	2,075	82,607,375	26.9
	Inca, 1948	7,250	2	3	...	21	984	12,899,160	36.8
	Junta, 1954	6,720	...	7	...	16	609	22,433,285	20.4
	La Ceiba, 1946	9,480	18	6	...	10	7,250	27,528,250	43.1
	La Ceibita, 1963	9,870- 9,878	26	...	...	19	12,777	59,763,605	43.8
	Leona, 1938	2,200-12,800	11	73	...	128	11,040	130,298,600	22.4
	Mapiiri Este, 1952	9,500	2	6	...	32	1,268	23,185,820	37.0
	Mata, 1954	9,000-12,500	75	77	...	325	34,006	439,336,190	33.3
	Merrey, 1937	5,400- 5,700	9	255	...	120	22,400	173,304,000	11.1
	Nipa, 1945	6,000- 8,500	66	99	...	270	24,713	430,667,245	28.0
	Oficina, 1937	5,900	54	115	...	380	38,386	646,641,890	20.5
	Oscurote, 1952	9,513	9	28	...	45	8,374	109,956,510	20.3
	Rosa, 1958	1,250-11,412	2	...	...	1	961	7,079,297	51.7
	San Joaquin, 1935	6,560	20	2	...	52	2,804	77,666,460	46.4
	Santa Ana, 1936	8,500	28	3	...	54	6,290	86,656,850	37.9
	Santa Rosa, 1941	8,500	117	3	...	58	29,093	299,026,945	44.9
	Soto, 1950	9,500	29	13	...	151	7,093	160,473,945	36.8
	Tapuco, 1953	10,000	4	2	...	21	1,382	24,985,340	34.0
	Yopales, 1937	4,600	8	52	...	71	9,250	90,354,250	21.2



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WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of wells				Production in bbl—		Gravity °API
			Flowing	Pumping	Gas lift	Shut in	Daily avg. 1st 6 mo. 1974	Cumulative 7/1/74	
VENEZUELA*—Continued									
	Zanjas, 1958	13,270	7	...	...	6	4,353	20,509,845	34.1
	Zapatos, 1955	11,500	15	...	...	47	9,831	111,995,315	37.0
	Zorro, 1953	11,100	10	4	...	12	5,019	57,754,935	25.0
	Zulus, 1957	12,710	7	...	...	11	2,012	14,827,380	33.4
	Zumo, 1954	9,200	5	25	...	17	4,791	68,747,715	16.8
	Others		75	31	...	273	21,071	186,607,915	
	Total		760	1,137	...	2,626	349,455	4,654,670,564	
FEDERAL TERRITORY OF AMACURO									
	Tucupita, 1945	5,600	15	15	...	35	2,996	46,278,413	16.8
	Others		...	...	...	25	...	57,415,540	
	Total		15	15	...	60	2,996	103,693,953	
STATE OF MONAGAS									
	Acema, 1960	12,520-13,750	35	14	...	34	23,084	56,140,600	26.4
	Aguasay, 1955	8,100-13,400	25	7	...	45	8,788	76,317,387	38.5
	Jobo, 1956	3,600-4,000	7	99	...	37	37,560	59,580,400	11.9
	Morichal, 1958	3,312	...	106	...	62	28,610	111,442,650	10.4
	Oritupano, 1950	7,657	20	55	...	35	20,135	102,932,275	19.3
	Orocual, 1933	2,954	9	4	...	24	2,514	16,562,610	20.6
	Piritai, 1958	450-1,100	...	58	...	8	2,594	18,276,810	17.2
	Quiriquire, 1928	7,000-7,200	...	350	...	110	15,420	723,929,300	16.3
	Santa Barbara, 1941	5,020-6,500	15	105	...	215	3,500	157,605,325	27.8
	Tacat, 1953	1,830-3,668	...	53	...	69	2,561	36,222,265	17.2
	Temblador, 1936	3,500-4,500	4	40	...	6	5,282	98,149,430	20.0
	Others		15	68	...	205	5,661	399,066,265	
	Total		130	959	...	850	157,709	1,855,225,377	
STATE OF GUARICO									
	Las Mercedes, 1942	1,200-4,500	2	52	...	100	1,447	126,996,155	27.6
	Ruiz, 1949	4,450	4	23	...	11	1,000	30,775,650	33.1
	Budare, 1958	4,523	22	...	...	10	24,408	38,685,920	31.8
	Others		10	87	...	135	2,551	68,585,115	
	Total		38	162	...	256	29,403	265,042,840	
STATE OF BARINAS									
	Tato Viejo, 1961	9,543	2	8	...	2	3,822	29,189,030	27.1
	Maporal, 1957	10,944	...	3	...	2	2,116	7,478,340	28.1
	Silvan, 1949	10,862	1	6	...	1	2,641	36,235,965	28.5
	Silvestre, 1948	8,850	1	26	...	12	9,552	105,944,980	24.8
	Sinco, 1953	8,500-9,100	6	34	...	29	18,798	200,562,270	25.7
	Others		14	10	...	3	10,718	14,263,770	
	Total		24	87	...	49	47,647	393,674,355	
STATE OF FALCON									
	Tiguaje, 1953	3,300	...	13	...	9	735	8,544,275	26.3
	Others		...	40	...	78	331	97,167,815	
	Total		...	53	...	87	1,066	105,712,090	
STATE OF ZULIA									
	Bachaquero, 1930†	3,444	190	1,980	...	943	533,605	4,684,433,425	22.4
	Barua, 1958	10,500	4	1	...	1	3,667	12,585,955	19.8
	Boscan, 1946	6,500-7,500	...	259	...	109	44,634	479,171,910	10.4
	Cabimas, 1917†	2,200	113	467	...	229	79,072	1,455,303,280	23.7
	Centro, 1957	12,568	67	6	...	54	113,000	349,199,000	33.6
	Cruces Manueles, 1916	300-8,000	9	62	...	26	3,357	162,549,700	30.5
	Ceuta, 1956	9,600-11,000	27	34	...	34	63,700	232,117,500	29.5
	La Concepcion, 1953	3,148-8,000	3	77	...	40	5,459	114,657,835	35.0
	Lago, 1958	11,450	26	...	...	17	38,346	121,610,290	31.5
	Lagunillas, 1926†	3,000	710	2,410	...	850	803,328	8,469,651,370	24.2
	Lama, 1957	8,320	158	70	...	88	259,774	1,819,755,610	32.8
	Lamar, 1958	13,003	62	11	...	37	131,569	669,111,285	34.1
	La Paz, 1925	4,268-8,000	13	63	...	30	16,800	773,915,100	32.0
	Los Claros, 1960	9,328	...	7	...	7	4,352	29,169,980	10.4
	Mara, 1945	5,248	7	45	...	40	9,009	375,227,758	27.7
	Mena Grande, 1914	4,132	1	291	...	177	11,007	578,854,384	18.8
	Sibucara, 1948	13,451	...	1	...	3	1,203	39,289,095	35.3
	Tarra W., 1947	4,250-5,500	6	14	...	14	3,113	63,340,750	38.3
	Tia Juana, 1928	3,000	124	1,656	...	326	296,566	2,734,086,916	18.8
	Others		19	6	...	23	11,306	28,525,378	
	Total		1,539	7,460	...	3,048	2,432,867	22,998,556,521	
	Venezuela total		2,506	9,873	...	7,176	3,021,146	30,377,575,700	
	†Partly offshore								
	*Data estimated								
ZAIRE									
	GCO, 1970*	11,825	...	...	...	5	...	...	30.0
	Mibale, 1973*	5,000-6,000	...	...	...	3	...	...	31.0

*These offshore fields may go on stream at 25,000 b/d in 1976.

Total wells drilled in the United States*—October 1974†

Data compiled by API

State-district	Total completions							Total exploratory wells‡				
	Oil‡	Gas§	Dry holes	Total wells	Total footage	Total wells all types||	Total footage||	Oil‡	Gas§	Dry holes	Total wildcats	Footage
Alabama	1	1	1	3	48,359	3	48,359	1	...	1	2	32,659
Alaska	1	1	...	2	10,895	2	10,895	...	1	...	1	695
Arkansas	7	...	15	22	124,451	23	132,432	1	...	9	10	71,752
California	86	9	29	124	402,371	142	416,195	3	3	13	19	111,410
North	...	8	19	27	163,926	27	163,926	...	3	9	12	77,107
Central Coastal	20	...	3	23	79,244	24	80,524	1	...	3	4	21,240
East Central	60	1	7	68	137,842	71	140,184	2	...	1	3	13,063
South	3	...	...	3	8,435	17	18,637	...	...	...	...	...
Offshore	3	...	...	3	12,924	3	12,924	...	...	...	...	...
Colorado	26	22	51	99	595,296	105	634,881	4	3	30	37	213,893
Florida	1	...	...	1	11,896	2	14,051	...	...	...	...	...
Idaho	...	...	1	1	120	1	120	...	...	1	1	120
Illinois	31	2	30	63	138,896	63	138,896	...	...	8	8	20,977
Indiana	19	2	31	52	91,865	56	97,207	2	1	19	22	37,363
Iowa	...	...	2	2	3,385	2	3,385	...	...	2	2	3,385
Kansas	107	27	107	241	584,820	254	599,132	6	1	51	58	188,695
Kentucky	11	7	29	47	65,906	52	73,190	2	...	12	14	23,987
Louisiana	76	64	109	249	1,631,031	257	1,688,765	2	3	67	72	592,391
North	38	45	47	130	539,676	133	540,998	1	2	35	38	254,034
South	24	11	31	66	604,384	67	611,943	1	...	14	15	178,124
Offshore	14	8	31	53	486,971	57	535,824	...	1	18	19	160,233
Michigan	16	2	28	46	225,461	46	225,461	6	2	22	30	143,804
Mississippi	8	5	28	41	285,400	46	305,100	1	...	13	14	128,525
Missouri	...	...	3	3	7,572	13	9,353	...	...	3	3	7,572
Montana	5	23	62	90	281,696	90	281,696	...	5	39	44	158,158
Nebraska	5	1	28	34	174,708	34	174,708	1	...	24	25	127,385
New Mexico	27	31	21	79	429,687	79	429,687	...	4	11	15	93,922
East	25	19	20	64	375,869	64	375,869	...	4	11	15	93,922
West	2	12	1	15	53,818	15	53,818	...	...	...	...	...
New York	13	...	...	13	18,270	18	24,805	...	...	...	...	...
North Dakota	8	...	15	23	164,821	23	164,821	2	...	9	11	77,449
Ohio	47	61	16	124	517,865	125	522,167	1	8	1	10	44,680
Oklahoma	98	74	104	276	1,364,869	291	1,398,505	...	9	28	37	264,204
Pennsylvania	43	33	7	83	180,419	94	197,635	2	4	6	12	44,680
Tennessee	5	...	6	11	19,127	11	19,127	2	...	6	8	14,937
Texas	375	150	413	938	5,113,271	961	5,181,870	21	43	211	275	1,700,706
Dist. 1	9	1	6	16	53,533	17	58,653	...	...	5	5	19,172
Dist. 2	9	28	29	66	372,392	67	377,502	1	15	18	34	204,449
Dist. 3	41	13	55	109	634,903	109	634,903	1	9	33	43	312,769
Dist. 4	33	27	29	89	519,433	89	519,433	3	5	17	25	181,200
Dist. 5	...	...	10	10	70,149	10	70,149	...	...	8	8	67,729
Dist. 6	11	8	14	33	221,367	35	222,603	...	2	11	13	100,021
Dist. 7B	51	14	74	139	450,349	144	466,107	7	4	53	64	242,180
Dist. 7C	39	24	87	150	968,923	155	973,950	3	...	8	11	48,370
Dist. 8	57	9	32	98	691,065	100	696,690	2	3	7	12	110,396
Dist. 8A	63	3	24	90	502,714	95	530,081	4	...	16	20	149,995
Dist. 9	47	5	30	82	227,543	84	230,899	...	2	18	20	99,257
Dist. 10	15	17	12	44	305,971	44	305,971	...	3	7	10	91,822
Offshore	...	1	11	12	94,929	12	94,929	...	...	10	10	73,346
Utah	23	...	13	36	324,716	37	330,585	...	...	11	11	67,364
Virginia	...	4	1	5	26,862	5	26,862	...	...	1	1	6,972
West Virginia	1	26	7	34	95,059	34	95,059	...	3	3	6	21,255
Wyoming	91	6	75	172	1,064,417	176	1,070,788	10	3	51	64	503,401
Gulf of Mexico—Northern	...	...	9	9	77,023	9	77,023	...	...	9	9	77,023
Total—Oct. 1974	1,131	551	1,241	2,923	14,080,534	3,054	14,392,760	67	93	661	821	4,779,364
Total—Sept. 1974	1,200	600	1,091	2,891	12,676,090	2,961	12,864,725	86	90	624	800	4,490,377
Cum. 1974	10,291	5,783	9,603	25,677	124,149,486	26,535	126,214,822	664	932	5,472	7,060	41,661,268
Cum. 12/3	7,983	4,929	8,269	21,181	106,362,217	22,066	108,352,869	506	648	4,762	5,916	...

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Sept. 28, 1974, through Oct. 25, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests and outpost (extension) tests. ||Includes 23 strat tests and 68 service wells, 12,059 and 300,167 ft., respectively.

terranean during the winter.

Special instrumentation includes a navigation computer which integrates dead reckoning, satellite and LORAN C inputs and provides continuous positioning data. The ship's map position is reported with accuracy to within 150 ft. Navigation services are being provided on a direct contract basis from Survey Systems Inc., a Houston-based firm specializing in electronic

positioning and surveying.

Gravity and magnetic data are recorded on magnetic tape in duplicate. The paired tapes are returned to Houston one at a time; the second remains on board until the first is reported intact at its Houston destination.

The ship stays in touch with Houston daily via a 1,000-w radiotelephone system.

Gravity and magnetic data can be

used to enhance and clarify seismic data. They are also useful in developing a broad geophysical overview of a very large area. The seven maps returned from the Mediterranean and Atlantic survey of the Karen Bech will include Bouguer gravity, total magnetic intensity, bathymetric, gravity residual, free air gravity, regional gravity, and the second vertical derivative of magnetics.

Seismic survey being done in Kamishak Bay

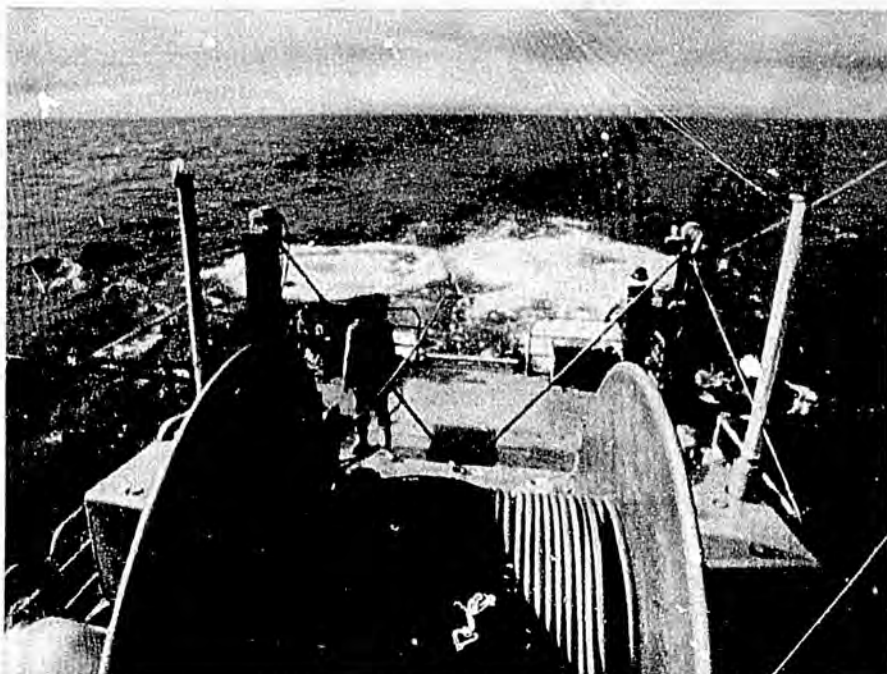
SEISMOGRAPH Service Corp. is conducting a shallow-water seismic survey in the Kamishak Bay area of Cook Inlet in Alaska using a specially built pontoon-type boat.

Of modular design, the boat, the Seisjet, was built by MonArk Boat Co. in Monticello, Ark., for ease of transport from prospect to prospect by Hercules aircraft. This is an especially important feature because of logistics difficulties common to exploration in the Arctic.

The craft is 60 ft long with an 18-ft beam and 30-in. draft fully loaded. The pontoons are 6 ft by 6 ft in cross section. Two GM 6B53 engines power Jacuzzi jet pumps to achieve 18 knots cruising speed. Fuel capacity is 2,500 gal.

Two twin-cylinder air guns, a mile of floating streamer-type cable with geophone drops, and 24-trace DFS III instrument comprise the seismic equipment.

Additionally, the boat is equipped with forward-scanning radar, Motorola miniranger for positioning, and Raytheon recording fathometer and digital



IN ITS seismic exploration mode, Seisjet trails a floating cable 4,500 ft long, attached to which are 24 four-cluster hydrophone stations. At predetermined time intervals, shock waves are created by the firing of two underwater air guns, each of which builds up 6,000 lb of air pressure.

depth finder. SSC's Anchorage Phoenix center is available to process data.

The Seisjet will begin work out of

the inlet of St. Augustine Island where the crew will be housed in a relocatable camp.

BOOKS

OFFSHORE OIL SCOUTS, January 1974 through July 1974, Status of the Offshore Oil Industry. Offshore Oil Scouts, 1669 Canal, New Orleans 70161. \$15 in U.S., \$30 overseas and Canada. Advance payment with order form is required.

This issue covers all data on Louisiana and Texas. Also available are computer-generated printouts of factual material pertaining to active OCS leases located Offshore Louisiana and Texas. Items which appear are: geographic area, block, OCS number, leased description, operator, etc. Price

\$75 printout of each sequence. Order from Offshore Oil Scouts, Box 61780, New Orleans 70161.

OIL SPILL PREVENTION AND REMOVAL HANDBOOK. Published by Noyes Data Corp., Mill Road at Grand Avenue, Park Ridge, N.J. 07656. 1974. By Marshall Sittig. 465 pp. \$36.

This book attempts to organize and clarify the many ways and means made available for the removal of contaminating oil from surfaces and beaches. Special attention is called to the list of companies producing ma-

terials and equipment useful in cleaning oil spills and beaches.

WORLD SURVEY OF SULPHUR RESOURCES—SECOND EDITION. Published by The British Sulphur Corp. Ltd., \$17.55 (£75) surface mail, \$18.72 (£80) airmail, Parnell House, 25 Wilton Rd., London SW1V 1NH, England.

Comprehensive update of 1966 first edition is arranged by major geographical regions on a country-by-country basis. It identifies sulfur resources in respect to mineral deposits, and covers recovery methods.

Worldwide crude-oil and gas production

OIL (1,000 b/d)	Oct. 1974	Sept.* 1974	10-month average				GAS (billion cu ft)		
			Daily prod. 1973	Daily prod. 1974	Change from Vol %		Oct. 1974	Sept. 1974	Cum. 1974
WESTERN HEMISPHERE									
Argentina	415.0	415.0	418.0	413.0	- 5.0	- 1.2	26.4	32.4	230.5
Bolivia	50.0	50.0	47.0	49.0	2.0	4.3	13.4	12.6	126.5
Brazil	170.0	170.0	169.0	170.0	1.0	0.6	3.7	4.2	39.1
Canada	1,597.0	1,615.0	1,790.0	1,711.0	- 79.0	- 4.4	291.7	290.9	2,728.3
Chile	30.0	30.0	32.0	30.0	- 2.0	- 6.3	20.1	21.7	173.7
Colombia	170.0	170.0	199.0	176.0	- 23.0	- 11.6	9.7	9.6	85.7
Ecuador	100.0	115.0	203.0	173.0	- 30.0	- 14.8	0.4	0.8	4.8
Mexico	580.0	580.0	462.0	570.0	108.0	23.4	58.9	59.0	565.8
Peru	75.0	75.0	68.0	76.0	8.0	11.8	6.6	6.4	60.8
Trinidad	180.0	180.0	164.0	176.0	12.0	7.3	5.0	9.9	57.7
United States	8,777.0	8,734.0	9,206.0	8,857.0	- 349.0	- 3.8	1,911.2	1,826.7	18,394.5
Venezuela	2,810.0	2,770.0	3,367.0	3,004.0	- 363.0	- 10.8	45.0	146.8	1,366.2
Total	14,954.0	14,904.0	16,125.0	15,405.0	- 720.0	- 4.5	2,392.1	2,421.0	23,833.6
WESTERN EUROPE									
Austria	45.0	45.0	49.0	46.0	- 3.0	- 6.1	4.9	5.7	77.5
Denmark	4.0	4.0	4.0	2.0	- 2.0	- 50.0	0	0	0
France	25.0	25.0	26.0	24.0	- 2.0	- 7.7	18.6	24.2	236.7
West Germany	120.0	120.0	130.0	122.0	- 8.0	- 6.2	50.4	57.9	572.1
Italy	20.0	20.0	15.0	19.0	4.0	26.7	32.9	1.1	489.2
Netherlands	39.0	39.0	30.0	31.0	1.0	3.3	234.2	229.5	2,391.6
Norway	44.0	50.0	36.0	31.0	- 5.0	- 13.9	0	0	0
Spain	40.0	40.0	15.0	41.0	26.0	173.3	0	0	0
United Kingdom	2.0	2.0	2.0	2.0	0	0	69.9	83.3	1,067.9
Yugoslavia	65.0	65.0	68.0	67.0	- 1.0	- 1.5	4.7	3.8	44.7
Total	404.0	410.0	375.0	385.0	10.0	2.7	415.6	449.5	4,879.7
MIDDLE EAST									
Abu Dhabi	1,169.0	1,412.0	1,342.0	1,452.0	110.0	8.2	0	0	0
Bahrain	68.0	67.0	68.0	67.0	- 1.0	- 1.5	0.1	0.2	3.1
Dubai	262.0	235.0	236.0	237.0	1.0	0.4	0	0	0
Iran	5,720.0	5,836.0	5,824.0	6,038.0	214.0	3.7	74.2	75.6	754.6
Iraq	1,727.0	1,604.0	1,915.0	1,766.0	- 149.0	- 7.8	11.2	9.7	107.3
Israel	100.0	100.0	101.0	100.0	- 1.0	- 1.0	0.2	0.1	3.8
Kuwait	2,060.0	2,225.0	3,115.0	2,569.0	- 546.0	- 17.5	0.1	0.2	1.4
Oman	280.0	285.0	291.0	292.0	1.0	0.3	0	0	0
Qatar	525.0	515.0	591.0	519.0	- 72.0	- 12.2	0.1	0.1	1.5
Saudi Arabia	9,052.0	8,780.0	7,840.0	8,493.0	653.0	8.3	0	0	0
Sharjah†	60.0	60.0	23.0	23.0	0	0	0	0	0
Syria	150.0	150.0	114.0	126.0	12.0	10.5	0	0	0
Turkey	65.0	65.0	66.0	65.0	- 1.0	- 1.5	0	0	0
Total	21,238.0	21,334.0	21,503.0	21,747.0	244.0	1.1	85.9	85.9	871.7
ASIA-PACIFIC									
Afghanistan							7.8	7.8	77.4
Australia	465.0	471.0	368.0	373.0	5.0	1.4	15.6	14.8	132.5
Burma	20.0	20.0	20.0	20.0	0	0	0.6	0.4	4.9
Brunei-Malaysia	375.0	375.0	316.0	368.0	52.0	16.5	0.8	0.2	2.0
India	150.0	150.0	148.0	149.0	1.0	0.7	1.5	0.4	15.5
Indonesia	1,385.0	1,350.0	1,310.0	1,430.0	120.0	9.2	17.1	13.7	125.1
Japan	15.0	15.0	15.0	15.0	0	0	7.1	8.0	81.2
Pakistan	8.0	8.0	8.0	8.0	0	0	13.9	11.2	115.7
Taiwan	3.0	3.0	2.0	3.0	1.0	50.0	4.3	3.2	37.0
Thailand	0.2	0.2	0.2	0.2	0	0	0	0	0
Total	2,421.2	2,392.2	2,187.2	2,366.2	179.0	8.2	68.7	59.7	591.3
AFRICA									
Algeria	900.0	900.0	1,112.0	1,059.0	- 53.0	- 4.8	1.7	1.6	17.1
Angola	20.0	20.0	14.0	20.0	6.0	42.9	5.1	4.9	30.8
Cabinda	150.0	150.0	138.0	149.0	11.0	8.0	0	0	0
Congo	35.0	35.0	40.0	35.0	- 5.0	- 12.5	0.6	0.6	4.8
Egypt	175.0	172.0	192.0	137.0	- 55.0	- 28.6	4.7	5.0	39.9
Gabon	190.0	190.0	144.0	176.0	32.0	22.2	1.5	1.3	12.2
Libya	1,069.0	1,325.0	2,272.0	1,596.0	- 676.0	- 29.8	3.1	4.6	34.7
Morocco	1.0	1.0	1.0	1.0	0	0	1.9	2.5	24.7
Nigeria	2,325.0	2,312.0	2,015.0	2,278.0	263.0	13.1	4.7	5.8	48.9
Tunisia	95.0	95.0	83.0	80.0	- 3.0	- 3.6	3.0	3.6	11.4
Total	4,960.0	5,200.0	6,011.0	5,531.0	- 480.0	- 8.0	26.3	29.9	224.5
COMMUNIST									
China	900.0	900.0	860.0	900.0	40.0	4.7	15.6	16.0	157.1
Rumania	290.0	290.0	283.0	290.0	7.0	2.5	77.9	97.4	777.7
U.S.S.R.†	9,396.0	9,393.0	8,525.0	9,125.0	600.0	7.0	808.4	760.0	7,554.2
Other	110.0	110.0	100.0	110.0	10.0	10.0	38.7	42.7	415.0
Total	10,696.0	10,693.0	9,768.0	10,425.0	657.0	6.7	940.6	916.1	8,904.0
World Total	54,673.2	54,933.2	55,969.2	55,859.2	- 110.0	- 0.2	3,929.2	3,962.1	39,304.8

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

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- 1—1000 HP COOPER-BESSEMER #FM-6
- 1—1000 HP COOPER-BESSEMER #JM-4
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- 2—1250 HP WORTHINGTON #BDC-6
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1. 750 HP Chl. Pneu. singl. stage, driven by Waukesha L7042 (new).
2. 130 HP Ariel singl. stage, driven by Waukesha F1197 (new).
3. 130 HP Ariel 2 stage, driven by Waukesha F1197 (new).
4. 350 HP Chl. Pneu. singl. stage, driven by Waukesha F3521 (new).
5. 750 HP Chl. Pneu. 2 stage driven by Waukesha L7042 (new).
6. 250 HP G-D HLE 2 stage, driven by Rollins L-3000.
7. 300 HP G-D RXE singl. stage, driven by Climax V-125.
8. 1000 HP Chl. Pneu. 3 stage, available February 1975.

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13' x 22'	100	304 SS Vert.	25,000
6' x 34'	500	Steel Horiz.	8,000
6'10" x 9'1"	432	CS/304-clad Vert.	3,000 (Unused)
6' x 34'	400	Steel Horiz.	8,000
6' x 34'	300	Steel Horiz.	8,000
7' x 34'	300	Steel Horiz.	10,000
7' x 34'	200	Steel Horiz.	10,000
7' x 34'	150	Steel Horiz.	10,000
7' x 34'	100	Steel Horiz.	10,000
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4' x 20'	125	Steel Horiz.	2,000

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OGJ's 1973 scoreboard

Net profits	9.67 billion	Up 53.4%	(27 companies)
Total assets	123.2 billion	Up 12.8%	(27 companies)
Return on total assets	7.9%	Up 2.1%	(27 companies)
Net liquids production	24.36 million b/d	Up 1.5%	(27 companies)
Runs to stills	22.96 million b/d	Up 6.6%	(25 companies)
Product sales	25.22 million b/d	Up 4.0%	(25 companies)
Net wells drilled	5,377	Down 3.3%	(18 companies)
Net gas production	45.6 billion cfd	Down 0.2%	(27 companies)

Oils' high profits abroad bring trouble in the U.S.

W. A. BACHMAN
Senior Editor

STEVEN KELLEY
Economics Editor

THE IRONY of oil industry profits is remarkable. Companies are earning more than ever but enjoying the rewards less.

For the first time in years, the industry as a whole is reporting earnings for 1973 and the first quarter of 1974 high enough to trigger significant expansion. Ordinarily this would be optimistic news all around.

But fuel shortages, foreign embargoes on oil exports to this country, and rising product prices have created a

situation where the petroleum industry has become the whipping boy of politicians and consumer groups. This is true even though companies in other industries also are enjoying record profits.

As a result, oil executives in their annual reports, at their annual meetings, or in first-quarter 1974 announcements are going to great length to explain their earnings. The threats of punitive taxes and sweeping government regulation are forcing companies to make unprecedented analyses of their operations and revelations of just where the new funds come from and how they will be invested.

A vintage year. By now, it is well established that 1973 was a banner year for oil-industry profits. Reports now

being made also show that earnings are running high so far in 1974.

The Oil and Gas Journal's survey of annual reports for large U.S. oil companies shows an average gain in earnings of 53% for 1973 over the previous year. A survey of 97 petroleum companies by New York's First National City Bank came up with the same percentage gain. A Chase Manhattan Bank study of worldwide profits produced a gain of 71%, but the survey included several European-headquartered companies which had still higher profits (OGJ, Apr. 22, p. 66).

How oil compares. But other industries also did well last year. The profits gain of 2,136 manufacturing firms surveyed by First National City Bank was 31%. The gain of 4,640 corporations in all industries was 23%.

The 53% gain for oil companies was exceeded by several other industry groups. Lumber was up 73%, nonferrous metals 69%, paper 67%, metal mining 63%, and iron and steel 61%. Meatpacking also had a 53% gain, and substantial increases were recorded by chemicals, aerospace, office machinery, and computers.

Measured by rate of return, oil-industry profits were more moderate. The Journal survey showed a return on stockholders' equity increased from 10% to 14.2% and the return on assets went from 7.9% to 10%. The return on net worth calculated by First National City increased from 10.8% to 15.6% which was only slightly greater than the 14.8% average return for all manufacturing. Over the last 10 years, the petroleum group averaged 11.8% compared with 12.4% for all manufacturing.

How they did it. Factors behind the growth in petroleum profits are little understood by the public, because the greatest impetus came from operations abroad.

Demand for petroleum products abroad increased at a greater rate than in the United States, and so did the prices of crude oil and refined products. The Chase Manhattan group of companies reported that 75% of their increased revenues occurred outside the United States and 85% of the profits growth came from abroad.

Currency devaluation and inflation played a large role in these increases. An estimated 25% of the profits growth was attributed to devaluation of the dollar, and one-sixth was attributed to increased value of inventories.

Other factors besides devaluation

How 27 large U.S. companies fared financially last year

Rank by assets		Net profits*			Gross op. rev.†		% net profit to gross op. rev.	
		\$ million	1972	% change	\$ million	% change	1973	1972
1.	Exxon	2,443	1,532	+ 59.5	25,724	+26.7	8.7	7.5
2.	Texaco	1,292	889	+ 45.3	11,407	+31.2	11.3	10.2
3.	Mobil	849	574	+ 47.9	10,160	+24.7	8.4	7.1
4.	Gulf	800	447	+ 79.0	8,417	+34.8	9.5	7.2
5.	California Standard	844	547	+ 54.3	7,762	+32.2	10.9	9.4
6.	Indiana Standard	511	375	+ 36.3	5,416	+20.3	9.4	8.3
7.	Tenneco	230	203	+ 13.3	3,910	+19.4	5.9	6.2
8.	Shell	333	260	+ 28.1	4,884	+19.8	6.8	6.4
9.	Atlantic Richfield	270	193	+ 39.9	3,983	+19.9	6.8	5.8
10.	Continental	243	170	+ 42.9	4,224	+23.2	5.8	5.0
11.	Phillips	230	148	+ 55.4	2,990	+19.0	7.7	5.9
12.	Sun	230	155	+ 48.4	2,286	+19.2	10.1	8.1
13.	Union	180	122	+ 47.5	2,552	+21.6	7.1	5.8
14.	Cities Service	136	99	+ 37.4	2,035	+ 9.3	6.7	5.3
15.	Getty‡	135	76	+ 77.6	1,601	+14.0	8.4	5.4
16.	Pennzoil United	84	59	+ 42.4	1,059	+19.4	7.9	6.7
17.	Ohio Standard	74	60	+ 23.3	1,482	+ 8.5	5.0	4.1
18.	Amerada Hess	246	46	+434.8	1,896	+42.1	13.0	3.5
19.	Marathon	129	80	+ 61.3	1,578	+23.5	8.2	6.2
20.	Ashland§	85	68	+ 25.0	2,053	+15.3	4.1	3.8
21.	Kerr-McGee	63	51	+ 23.5	728	+ 7.1	8.7	7.4
22.	Skelly	44	38	+ 15.8	580	+10.5	7.6	7.2
23.	Murphy	48	14	+242.9	499	+32.0	9.6	3.8
24.	Superior	33	5	+560.0	152	+ 5.6	21.7	3.6
25.	Louisiana Land	70	63	+ 11.1	180	+23.3	38.9	43.1
26.	American Petrofina	37	18	+105.6	448	+57.2	8.3	6.3
27.	Clark	30	8	+275.0	397	+35.8	7.6	3.0
Total		9,669	6,300	+ 53.4	108,403	+23.5	8.9	7.2

*Excludes nonrecurring gains and losses. †Excludes nonoperating income and excise taxes ‡Getty

... and a summary of their worldwide operations for the past

Rank by assets		Net liquids production			Crude runs to stills		
		Thousand b/d	1972	% change	Thousand b/d	1972	% change
1.	Exxon	5,525	5,734	- 3.6	5,761	5,146	+12.0
2.	Texaco	4,286	3,777	+13.5	3,052	2,952	+ 3.4
3.	Mobil	2,522	2,399	+ 5.1	2,365	2,194	+ 7.8
4.	Gulf	3,140	2,214	- 2.3	1,976	1,945	+ 1.6
5.	California Standard	3,170	3,159	+ .03	2,248	2,109	+ 6.6
6.	Indiana Standard	875	815	+ 7.4	1,100	1,016	+ 8.3
7.	Tenneco	81	82	- 1.2	77	90	-14.4
8.	Shell	631	638	- 1.1	1,085	1,001	+ 8.4
9.	Atlantic Richfield	656	652	+ 0.6	746	753	- 0.9
10.	Continental	556	594	- 6.3	546	509	+ 7.2
11.	Phillips	365	363	+ 0.1	460	450	+ 2.2
12.	Sun	369	369	0	580	549	+ 5.6
13.	Union	380	365	+ 4.1	472	440	+ 7.3
14.	Cities Service	227	227	0	235	269	-12.6
15.	Getty‡	420	433	- 3.0	239	270	+ 3.9
16.	Pennzoil United	47	42	+11.9	36	33	+ 9.1
17.	Ohio Standard	51	50	+ 2.0	382	400	- 4.5
18.	Amerada Hess	215	231	- 5.9	492	444	+10.8
19.	Marathon	441	453	- 2.6	313	286	+ 9.4
20.	Ashland‡	51	42	+21.4	338	327	+ 3.4
21.	Kerr-McGee	38	41	- 7.3	39	37	- 5.4
22.	Skelly	86	89	- 3.4	86	80	+ 7.5
23.	Murphy	52	49	+ 6.1	94	72	+30.6
24.	Superior	64	70	- 8.6			
25.	Louisiana Land	86	79	+ 8.9			
26.	American Petrofina	21	20	+ 5.0	176	97	+40.2
27.	Clark	2	2	0	104	105	- 1.0
Total		24,357	23,989	+ 1.5	23,962	21,524	+ 6.6

§Sales. ‡Getty data includes interest in Skelly. †Fiscal year ended Sept. 30, 1973.

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How 15 small companies fared

Company	Net profits (\$ thousands)		% change
	1973	1972	
Corco	34,117	3,113	+995.9
Tesoro	19,874	13,047	+ 52.3
Mapco Inc.	19,598	13,065	+ 50.0
Quaker State	19,202	15,207	+ 26.3
General Crude Oil	17,013	14,177	+ 20.0
Pioneer Natural Gas	12,397	9,852	+ 25.8
Crown Central Pet. Corp.	8,441	1,317	+540.9
Helmerich & Payne Inc.	6,368	4,449	+ 43.1
Inexco Oil Co.	5,811	4,519	+ 28.6
Apco Oil Corp.	5,717	6,186	- 7.6
Woods Corp.	5,190	3,891	+ 33.4
Barber Oil & Gas Co.	3,221	2,648	+ 21.6
Western Co. of N. America	2,372	1,744	+ 36.0
Forest Oil Corp.	(1,037)	771	-234.5
White Shield Corp.	(2,750)	981	-380.3
Total	155,534	94,967	+ 63.8

and inflated inventories also accounted for increased earnings. Tanker rates soared to record highs from subnormal levels in 1972, making transportation operations of many companies very profitable. Petrochemical operations also enjoyed a substantial recovery during the year and once again became a strong profit center for a large number of firms.

The companies surveyed by the Journal report a 23.5% gain in gross operating revenues, while the average return on revenues advanced from 7.2% to 8.9%. Working capital of the group increased by 29.8% to \$15.3 billion; and the companies put this to work by spending \$13.7 billion on capital projects, a 21.2% gain over expenditures the year before.

Operating statistics for the group also are impressive. The companies on a worldwide basis reported liquids production of 24,357,000 b/d, an increase of 1.5%. They stepped up refinery runs by 6.6% to 22,962,000 b/d and product sales by 4% to 25,216,000 b/d. Natural-gas sales held about the same at 45.5 billion cfd. The number of net wells drilled, however, declined 3.3% to 5,558.

What companies say. The trends revealed in the surveys were echoed in comments of company executives in their annual reports.

Almost without exception this year, the reports dwelled at length on explanations of the world energy picture, the vast need for capital funds, and the concern over the political attitude of governments both in this country and abroad.

Cities Service executives declared

that prices and profits are the basic issues in the long-term energy situation. Marathon said the most serious challenge before management is communicating the basic facts of the petroleum shortage to the public and of the overwhelming need for capital.

Every company in the Journal survey reported plans for substantial increases in capital investment, particularly in exploration, production, processing, and stepped-up activity in alternate energy sources. Many noted specifically that the investment needs far exceeded internal cash sources and will require outside financing. And this will make a high level of earnings vital.

Particular attention was given to U.S. earnings. Marathon and Sohio noted that profits from domestic operations actually declined. For Marathon, profits from U.S. operations dipped from \$64.9 million to \$61.8, while those from abroad increased from \$14.9 to \$67.6 million. For Sohio, the domestic decline was 4.8%, and the foreign gain 59.3%. Exxon said earnings in the U.S. were up 15.4%, about in line with the increase in product sales volume. Texaco's domestic profits were only 3.4% higher. Sun reported 80% of its added profits came from abroad, and the figure for Phillips was 81%. These joined many others in noting that their foreign earnings will help finance expansion projects in this country.

Time needed. Several companies showed a sensitivity in their annual reports to charges that industry capital spending is not showing results in greater energy reserves or rates of

production.

The executives pointed out that current expansion projects require a longer lead time and require a much larger investment than formerly, thus tying up larger amounts of nonproductive capital. Lead times of 3-5 years or longer are needed in bringing new fields on production or putting refineries on stream.

Continental illustrated this trend by a special report in its annual on the North Sea. Capital investment to develop currently known North Sea oil and gas reserves, Continental said, will amount to an estimated \$12-15 billion. Development costs per barrel of peak daily production capacity in the northern North Sea will average about \$4,000. This is about 60% greater than the cost of developing discoveries in the Gulf of Mexico and 10 times the cost required for development of onshore discoveries in the Middle East.

California Standard's report left no doubt that much time and money will be needed to correct the U.S. energy imbalance. Socal executives suggested an energy program for the U.S. which probably represents a consensus of the industry. It includes policies to emphasize more efficient energy usage, encourage domestic exploration, expedite leasing of federal lands, speed refinery expansion, moderate environmental regulations, build deepwater terminals, research the best use of coal, shale, and tar-sands resources, and finally speed the construction of nuclear-fueled power plants.

The annual report taken as a group revealed one fact. The executives of the nation's oil companies realize they face the greatest challenge since the Drake well, and they are dedicated to meeting it.

BP, Imperial set U.K. ethylene plant

BP CHEMICALS and Imperial Chemical Industries have officially announced a joint-venture 500,000-metric-ton/year ethylene plant for Teesside, U.K. (OGJ, Oct. 1, 1973, Newsletter). Completion is scheduled for mid-1977.

A 500-mile pipeline will carry ethylene to BP's Grangemouth, Scotland, complex. Each company will provide its own feedstock, mainly naphtha. The plant, designed by Stone & Webster, will also be able to process natural-gas liquids.

Working cap.		Funds from operations		Cap. & expl. expend.		% return on stockholders equity		% return on total assets		Total assets		
(\$ million)	% change	(\$ million)	% change	(\$ million)	% change	1973	1972	1973	1972	\$ million	1972	% change
3,486	+ 45.7	4,079	+ 43.0	2,235	+ 12.7	17.8	12.5	9.7	7.1	25,079	21,558	+16.3
1,723	+ 80.2	1,926	+ 46.0	1,334	+ 11.8	16.2	12.4	9.5	7.3	13,595	12,032	+13.0
564	- 11.7	1,363	+ 30.9	1,334	+ 13.0	14.9	11.2	7.9	1.2	10,690	9,217	+16.0
1,514	+ 4.8	1,560	+ 43.1	979	+ 14.0	14.4	8.3	7.9	4.8	10,074	9,324	+ 8.0
1,271	+ 60.3	1,250	+ 35.3	1,117	+ 16.9	14.5	10.5	9.3	6.8	9,082	8,084	+12.3
775	+ 13.5	971	+ 22.0	1,100	+ 16.9	12.4	9.9	7.3	6.1	7,018	6,186	+13.4
333	- 8.8	499	+ 15.8	392	+ 13.6	12.0	11.1	4.3	4.1	5,427	4,838	+12.2
752	+ 12.6	785	+ 17.3	581	- 1.7	10.7	8.9	6.2	5.0	5,381	5,172	+ 4.0
718	+ 53.4	573	+ 19.6	500	+ 37.4	8.7	6.5	5.3	4.2	5,109	4,629	+10.4
483	+ 44.6	554	+ 39.2	476	- 11.7	13.4	10.4	6.6	5.2	3,693	3,250	+13.6
612	+ 17.7	469	+ 27.8	329	+ 24.2	11.7	8.2	6.4	4.5	3,607	3,270	+10.3
357	+ 77.6	463	+ 34.6	284	+ 5.2	11.9	8.8	6.8	5.2	3,382	2,980	+13.5
357	+ 6.3	479	+ 18.0	391	+ 24.5	10.5	7.6	6.2	4.5	2,909	2,696	+ 7.9
277	+ 3.4	305	+ 17.3	402	+ 53.4	8.9	6.9	5.1	4.1	2,660	2,406	+10.6
228	- 14.0	362	+ 32.6	437	+ 60.1	8.5	5.2	5.7	3.5	2,355	2,182	+ 7.9
91	- 43.5	189	+ 21.9	293	+125.4	13.3	11.7	4.2	3.2	2,001	1,837	+ 8.9
327	+ 11.6	158	+ 6.0	193	+ 55.6	6.5	5.6	3.8	3.3	1,964	1,802	+ 9.0
417	+112.8	354	+100.0	242	+ 70.4	31.8	8.3	12.8	3.4	1,922	1,378	+39.5
105	+156.1	246	+ 33.0	169	- 12.0	14.6	10.1	8.2	5.3	1,572	1,514	+ 3.8
298	+ 7.1	177	+ 14.9	176	+ 43.0	15.5	13.4	5.9	5.3	1,437	1,170	+13.1
204	+ 3.0	125	- 1.6	113	+ 48.7	11.2	10.0	7.2	6.3	867	807	+ 7.4
91	- 20.9	136	+ 18.3	175	+ 7.3	7.4	6.7	5.5	5.0	803	748	+ 7.4
99	+ 47.8	111	+ 94.7	113	- 7.8	20.2	7.6	6.9	2.5	704	568	+23.9
43	+ 59.3	53	+ 29.3	30	- 6.3	9.0	1.5	4.9	0.9	660	572	+15.4
93	+ 93.8	106	+ 17.8	79	- 26.9	27.5	28.4	15.4	15.5	455	406	+12.1
72	+ 38.5	57	+ 62.9	135	+440.0	13.4	12.3	8.2	6.9	451	264	+70.8
42	+ 61.5	42	+100.0	15	+ 15.4	27.9	10.1	11.6	4.1	263	206	+27.7
15,332	+ 29.8	17,392	+ 34.2	13,729	+ 21.2	14.2	10.0	7.9	5.8	123,160	109,196	+12.8

data includes interest in Skelly. \$Fiscal year ended Sept. 30, 1973.

2 years

Refined product sales			Number of employees			Net wells drilled			Net natural-gas production		
Thousand b/d	1972	% change	1973	1972	% change	1973	1972	% change	MMcfd	1972	% change
6,178	5,701	+ 8.4	137,000	141,000	- 2.8				*9,767	*9,323	+ 4.8
3,472	3,381	+ 2.7	74,918	76,496	- 2.1	969	1,177	-17.7	*4,516	*4,685	- 3.6
2,482	2,409	+ 3.0	73,900	75,000	- 1.5				3,682	3,595	+ 2.4
1,781	1,677	+ 6.2	51,600	57,500	-10.3				3,360	3,572	- 5.9
2,259	2,169	+ 4.1	39,269	41,497	- 5.4	266	370	-28.1	*1,579	*1,671	- 5.5
1,234	1,226	+ 0.7	46,589	46,627	- 0.1	1,208	1,130	+ 6.9	3,935	3,911	+ 0.6
125	122	+ 2.5	83,500	78,000	+ 7.1				972	935	+ 4.0
1,136	1,068	+ 6.4	32,080	32,871	- 2.4	440	513	-14.2	2,268	2,460	- 7.8
896	884	+ 1.4	26,284	27,756	- 5.6	309	356	-13.2	2,138	2,203	- 3.0
654	657	- 0.4	39,796	38,092	+ 4.5	486	458	+ 6.1	*1,451	*1,326	+ 9.4
690	733	- 5.9	33,429	35,265	- 5.2	267	199	+34.2	1,825	1,853	- 1.5
647	634	+ 2.1	24,979	26,384	- 5.3	241	198	+21.7	*1,523	*1,510	+ 0.9
487	458	+ 6.3	15,926	16,263	- 2.1	256	252	+ 1.6	1,534	1,634	- 6.1
374	386	- 3.1	18,000	21,400	-15.9	135	159	-15.1	1,127	1,087	+ 3.7
273	298	- 8.4	11,258	12,317	- 8.6	179	163	+ 9.8	1,261	1,261	0
35	31	+ 12.9	10,732	9,618	+ 11.6				675	605	+11.6
385	408	- 5.6	18,823	21,111	-10.8				110	145	-24.1
615	575	+ 7.0	4,867	4,714	+ 3.2	60	39	+53.8	743	763	- 2.6
349	321	+ 8.7	8,238	8,048	+ 2.4				419	429	- 2.3
474	452	+ 4.9	26,123	23,077	+13.2				312	172	+81.4
112	131	-14.5	8,966	9,217	- 2.7	85	94	- 9.6	300	304	- 1.3
135	144	- 6.3	4,367	4,835	- 9.7	57	91	-37.4	512	516	- 0.8
154	147	+ 4.8	2,989	2,992	0	78	60	+30.0	71	66	+ 7.6
			2,690	2,420	+11.2	73	63	+15.9	1,033	1,083	- 4.6
						238	203	+17.2	385	390	- 1.3
149	119	+25.2	2,904	2,276	+27.6	30	33	- 9.1	50	56	-10.7
120	111	+ 8.1	3,095	1,567	+97.5				6	7	-14.3
25,216	24,242	+ 4.0	802,322	816,343	- 1.7	5,377	5,558	- 3.3	45,554	45,562	- 0.2

1965		1964		1963	
Net income	%	Net income	%	Net income	%
63.4	22.2	59.4	23.0	52.4	22.7
35.8	15.5	23.7	14.0	18.1	11.7
90.1	8.1	47.1	7.3	44.0	7.0
100.6	10.2	84.5	9.1	77.5	8.6
8.7	27.8	2.1	8.9	1.5	6.8
96.2	10.2	100.1	11.1	87.4	10.5
1,021.4	11.9	1,050.6	12.6	1,019.5	12.8
57.7	6.9	43.0	5.6	43.0	6.1
427.2	11.2	395.1	11.0	371.4	10.9
25.1	14.6	20.7	14.7	18.8	15.8
60.1	11.3	60.4	11.8	49.1	10.2
320.1	9.1	294.2	8.8	271.9	8.6
6.4	6.1	4.3	4.9	4.8	5.7
127.7	9.9	115.0	9.3	108.1	8.9
234.0	13.4	198.2	12.3	179.9	12.0
34.0	8.8	25.7	7.1	24.2	7.0
391.2	11.1	345.3	10.5	322.1	10.5
219.3	8.1	194.9	7.5	183.1	7.3
49.7	12.7	43.8	12.0	38.9	11.4
85.5	10.1	68.5	8.8	61.2	8.4
636.7	14.9	577.4	14.6	547.6	15.6
112.8	10.4	92.9	14.7	55.2	9.9
4,203.7	11.2	3,846.9	10.8	3,579.7	11.0

Quarterly financial statements filed with the Security

oil's top 22

revenue in taxes, exclusive of sales and excise levies in 1972. There were no comparable figures for other industries, but the year before the tax burden for oil and gas was 5.59¢, greater than the 4.58¢ for other U.S. mining and manufacturing corporations and the 4.17¢ for all other businesses.

Oil and gas companies paid lower income taxes per dollar of revenue, Pirinc said, due mainly to percentage depletion and intangible drilling cost deductions, but other types of taxes were greater than for other businesses. The main taxes in the other category paid by oil and gas companies were state and local property taxes and crude-oil and natural gas severance taxes.

Oil and gas companies paid \$1.2 billion in federal income taxes in 1972 and \$2.4 billion in other types of taxes. The effective federal income tax rate for the domestic oil industry rose from 19.1% in 1969 to 22% in 1970, 23.5% in 1971, and 25.6% in 1972, due

largely to the effects of the Tax Reform Act of 1969, Pirinc reported.

In addition to its domestic tax payments, the U.S. oil industry also paid foreign income taxes totaling \$7.2 billion in 1972, \$5.8 billion in 1971, and

\$3.6 billion in 1970. The foreign income tax together with the domestic federal income tax liability gave the U.S. oil industry an effective worldwide income tax rate of 58% in 1972, according to Pirinc calculations.

Oxy, Libya sign exploration deal

OCCIDENTAL Petroleum Corp. has signed the first exploration agreement made by Libya since the Sept. 1, 1969, revolution and expects to be drilling in the new exploratory area this year.

Occidental, which, along with other operators in Libya, has experienced numerous problems dealing with the revolutionary government, will be operating under a production-sharing contract on 19 blocks covering 11 million acres.

Most of the blocks are in the Sirte basin, where Libya's present producing fields are located, and some cover concessions previously relinquished by others.

Terms of the contract are demanding, but Oxy believes much of the acreage has not been adequately explored. Oxy's current production in Libya was found on relinquished acreage.

Under terms of the agreement, the national oil company, Libyan National Oil Corp., will get 81% of future production and Oxy 19%. Oxy's share will

be free of Libyan taxes and royalties.

Oxy will finance all exploration and pay 19% of development costs on commercial discoveries. Libya will pay 81% of development costs but will be reimbursed for this amount if production reaches a specified—but unannounced—figure. Oxy would make the reimbursement at a rate of 5%/year over 20 years without interest.

Production costs will be borne 81% by Libya and 19% by Oxy.

Subject to mutual agreement on prices, Oxy will have the option to purchase Libya's share of future production.

The agreement permits operations for 35 years if a commercial discovery is made on a block within 5 years. It does not effect Oxy's present concessions, held jointly by Oxy and Libyan National.

Oxy says it is contracting for two or three seismic crews to begin shooting operations this spring or summer and expects to have a rig in the field before the end of the year.

U.S. firms plan two more mobile rigs

U.S. drilling contractors plan to build two more mobile offshore rigs.

Sedco Inc., Dallas, will build still another of its 700-series semisubmersibles, and Storm Drilling S.A., a subsidiary of Houston-based Storm Drilling Co., has let contract for a new jack-up rig to Bethlehem Singapore Private Ltd.

Sedco's new unit, to be known as Sedco 708, will be leased to Sun Oil Co. for at least 2 years starting late in 1976. A shipyard contract has not yet been awarded, although Sedco is negotiating with Gulf Coast and West Coast yards.

Cost of the fully equipped rig will be in excess of \$40 million, and Sun estimates its total cost for rig operation and related equipment and supplies will run about \$75,000/day.

Sun said it made this long-term com-

mitment in order to strengthen its exploration capability in deep waters off the continental U.S.

Sedco also announced it has received a 2-year drilling contract from a consortium including Shell, ARCO, and Mobil for use of the Sedco 706. The semisubmersible unit is being built at the Kaiser shipyard in California, with delivery scheduled the fall of 1975.

Delivery of Storm's new unit is scheduled in October 1975. It's to be rated to 25,000 ft in 250 ft of water.

Award of the latest contract brings to six the number of Bethlehem-designed offshore mobile units under construction or scheduled at Bethlehem's Singapore yard.

Other units under construction by Bethlehem include five semisubmersibles and four jack ups at its Beaumont, Tex., yard.

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compatible with most other commercial additives.

Antioxidant 733—For gasoline and jet fuel. Has "across the board" military approval.

Antioxidant 735—A phenolic inhibitor for use in industrial oils.

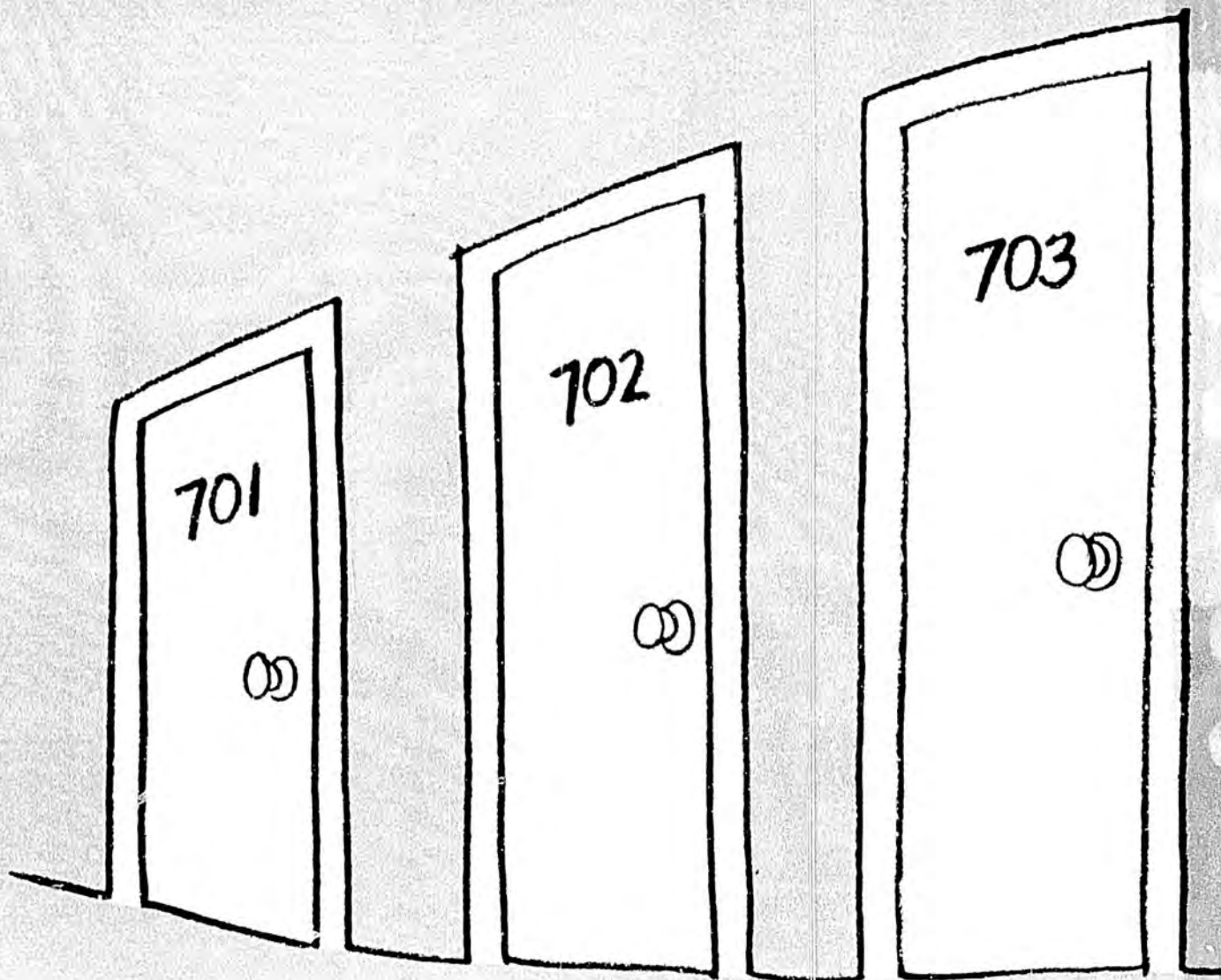
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Net income after tax and the rate of return on equity of 22 U.S. oil companies (1963-73)

Company	1973		1972		1971		1970		1969		1968		1967		1966	
	Net income	% return*	Net income	%	Net income	%	Net income	%	Net income	%	Net income	%	Net income	%	Net income	%
Amerada Hess†	151.8	23.5	46.2	8.3	133.3	24.0	114.0	25.7	86.5	23.7	89.8	19.8	76.8	22.2	73.1	2
Ashland	98.3	17.3	68.0	13.5	40.5	8.8	52.0	11.7	56.9	13.3	53.6	14.6	48.4	15.5	45.0	1
Atlantic Richfield	270.2	8.9	192.5	6.5	210.5	7.3	209.5	7.5	230.1	8.5	105.8	7.8	130.0	10.2	113.5	
Cities Service	135.6	9.8	99.1	6.9	104.5	7.7	118.6	8.9	127.2	10.0	121.3	9.9	127.8	10.9	120.1	1
Clark	30.5	29.9	8.3	9.8	3.6	4.7	10.8	14.0	13.0	18.7	12.1	20.4	11.5	23.4	9.6	2
Continental	242.7	14.0	170.2	10.4	140.1	9.1	160.3	10.7	146.4	9.8	150.0	10.6	136.1	10.1	115.6	11
Exxon Corp.	2,440.0	18.5	1,531.8	12.5	1,516.6	13.1	1,309.5	12.0	1,242.6	12.3	1,276.7	13.0	1,155.0	12.3	1,090.1	12
Getty	135.0	8.8	76.1	5.2	120.1	8.5	103.2	7.8	105.8	8.3	98.3	8.3	118.2	10.5	92.3	9
Gulf†	760.0	14.0	447.0	8.3	561.0	10.2	550.0	10.4	610.6	12.1	626.6	13.2	568.3	12.9	504.8	12
Kerr-McGeet	58.8	10.8	50.6	10.1	40.7	10.8	35.9	10.3	33.6	10.3	36.4	12.0	32.1	11.5	33.0	12
Marathon	129.4	15.2	79.8	10.2	88.7	11.7	86.5	11.8	89.4	12.1	83.3	12.7	73.9	12.3	68.8	12
Mobil	842.8	15.7	574.2	10.9	540.8	10.9	482.7	10.4	456.5	10.4	430.7	10.3	385.4	9.8	356.1	9
Murphy	53.6	24.4	14.3	7.6	11.1	6.2	9.3	6.5	6.2	4.5	7.3	5.4	8.2	6.2	8.4	7
Phillips	230.4	12.1	148.4	8.1	132.3	7.6	132.3	7.8	127.8	7.7	129.9	8.0	164.0	11.0	138.4	10
Shell	332.7	10.9	260.5	8.9	244.5	8.7	237.2	8.6	291.2	10.9	312.1	12.3	284.9	13.8	255.2	13
Skelly	44.0	7.5	37.6	6.8	38.3	7.0	36.1	7.0	38.4	7.7	40.3	8.5	42.0	9.3	37.0	8
Standard of Calif.	843.6	14.4	547.1	10.5	511.1	10.4	454.8	9.8	453.8	10.3	451.8	10.7	409.4	10.3	401.2	10
Standard (Ind.)	511.2	12.4	374.7	10.0	340.6	9.6	314.0	9.3	321.0	10.0	309.5	10.1	280.9	9.6	255.9	9
Standard (Ohio)	74.1	6.6	59.7	5.6	58.8	5.7	64.4	6.3	51.9	5.3	70.1	13.0	67.1	14.5	56.9	13
Sun	230.0	12.3	154.7	8.8	151.6	8.9	139.1	8.4	152.3	9.4	164.4	10.9	156.2	15.2	100.6	10
Texaco	1,292.4	25.0	889.0	12.4	903.9	13.4	822.0	13.1	769.8	13.1	819.6	14.5	754.4	14.8	692.1	15
Union of Calif.	180.2	10.6	121.9	7.6	114.7	7.4	114.5	7.6	138.9	9.5	149.8	10.9	145.0	11.2	134.2	11
Totals	9,087.3	15.1	5,951.7	9.7	6,007.3	10.2	5,556.7	10.4	5,549.9	10.9	5,539.4	11.8	5,175.6	12.0	4,701.9	11.

*Equity as of Sept. 30, 1973. †Full years income estimated on the basis of income reported for the first 9 months of 1973.

Source: Compiled by Office of Tax Analysis, Department of Treasury, from Standard and Poors's Industrial Survey, Moody's Industrial Manual, Exchange Commission (10 Q Forms).

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Treasury cites 1968-72 U.S. profits dip for

DOMESTIC profits for 22 of the largest oil companies actually declined from \$3.672 billion in 1968 to \$3.563 billion in 1972, a study by the Treasury Department discloses.

During the same period, international profits for the same group of companies rose from \$1.709 billion to \$2.353 billion.

Also, the Treasury analysis shows, the 1973 earnings are "primarily attributable to foreign inventory profits from skyrocketing prices, increased profits from increases in foreign product prices, and efficiencies in foreign refinery and other operations unrelated to the prices paid by U. S. consumers."

Affirming a point made by the companies, Treasury says further "that the higher 1973 profits must be interpreted in the light of the lower-than-normal profits realized in 1972 and the several years immediately prior."

Profits overall for the 22 companies rose last year to \$9.087 billion from \$5.951.7 billion in 1972. At the same

time the rate of return on equity jumped to 15.1%, after falling to 9.7%, the low point of the past decade, in 1972.

The 1973 figures are based on actual earnings for the first 9 months of the year, converted to an annual basis.

During the 1963-72 decade, rate of return peaked at 12% in 1967, then slumped each year thereafter until the shortage last year, made worse by the Arab embargo, firmed up world prices and profits.

A Federal Trade Commission report shows oil refiners' profits for the 12 months ending last September yielded a return of 10.5%, compared with a 12.4% return for all manufacturing. During the past decade, FTC figures show the oil-industry return to be at or below the average for other businesses.

The 1973 figures computed by Treasury show that some companies were much better situated than others to benefit from tight supply and rising prices. Clark Oil & Refining Corp.'s

return shot up from 9.8%, as computed by Treasury, to 29.9%. Texaco's rose from 12.4% to 25%, Treasury said, although the absolute increase in profits didn't rise proportionately.

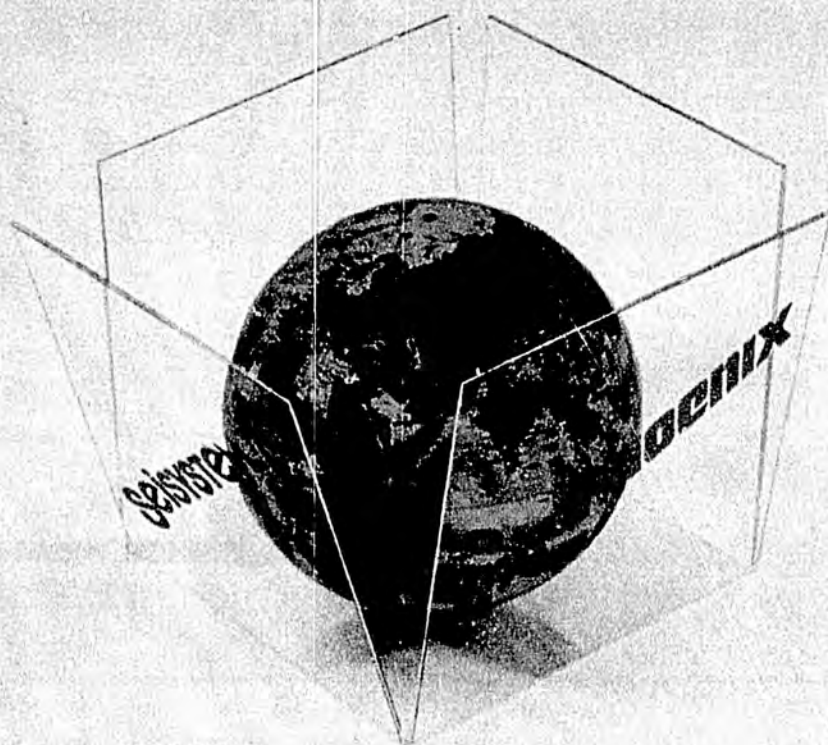
The next best performances were reported not by the international giants but by Murphy Oil Corp., which earned 24.4% on equity, and Amerada Hess Corp., which made 23.5%.

Exxon Corp. earned 18.5%, compared to 15.7% for Mobil Oil Corp., 14.4% for Standard Oil Co. of California, 14% for Gulf Oil Corp., 12.4% for Standard of Indiana, and 12.3% for Sun Oil Co.

At the lower end of the scale, Standard Oil Co. (Ohio) earned only 6.6%, Skelly Oil 7.5%, Getty Oil 8.8%, and Atlantic Richfield Co. 8.9%.

Taxes still high. Also last week, the Petroleum Industry Research Foundation Inc. released an updated report on, "The Tax Burden on the Domestic Oil and Gas Industry." It showed that domestic oil and gas companies paid an average of 5.6¢/dollar of gross

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Progress painfully slow toward improved U.S. energy position

One year after the embargo, crude supplies are ample and product stocks in better shape—but the country's basic energy position has improved little. Election-year politics in Congress, coupled with widespread ignorance in Washington of the workings and needs of the petroleum industry and business in general, crippled most helpful moves on the federal level and brought still more controls.

A YEAR has passed since the Arab oil embargo accompanied by escalating prices exposed for all Americans to see the depth of their nation's costly energy insecurity. Subsequent events have confirmed the realization that the nation faces a long and expensive economic restructuring to improve its position.

At API time last year, the entire oil industry was scurrying to find crude supplies to replace volumes lost by the Arab export embargo to this country. For the first time in its modern history, spare U.S. oil-producing capability was inadequate to cover an emergency. Fears of an industrial and transportation shutdown were widespread.

At API time this year, the embargo has long been lifted, crude supplies worldwide are ample even if quadrupled in price, and product stocks in the United States are in better shape this season than a year earlier.

Nonetheless, the nation's basic energy position has improved very little over the year, even though the industry has taken many initial steps aimed at change. The time lag for such projects looking to energy independence inhibit spectacular early achievements.

Americans, however, can count some gains

that augur well for the future. From the embargo experience, they have come closer to realizing that:

- The energy crisis is real and not contrived or arranged by the big oil companies to exploit the consumer.

- The days of cheap energy based on ample supplies of oil and gas are over for this country. New petroleum reserves and new energy sources must command higher prices to attract the vast amounts of capital needed for their development.

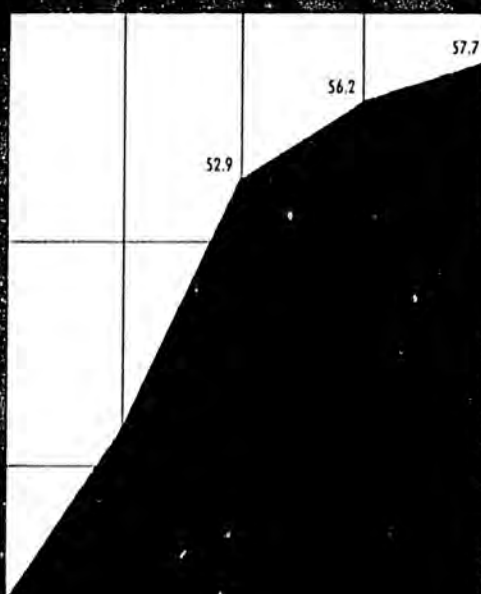
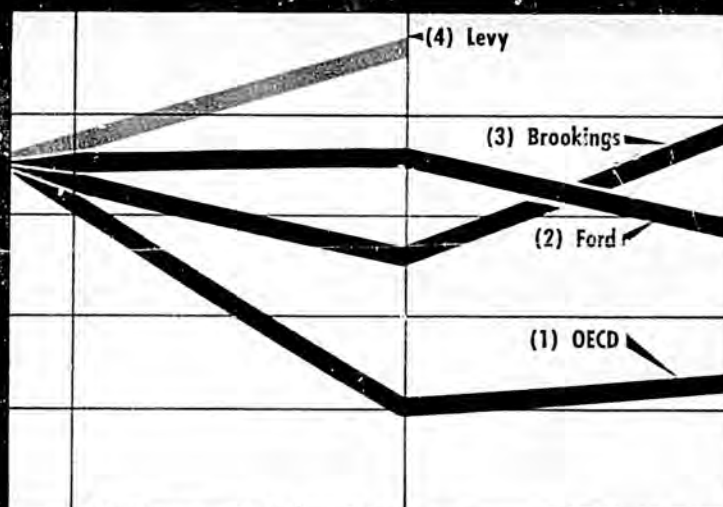
- Conservation through more-efficient use of fuels has become a necessary watchword for all consumers, industry and public alike.

- Importance of oil and gas in the nation's energy mix will continue for years, and continued imports of oil from abroad must be maintained until the nation can develop greater domestic sources.

- Outlines of a long-range energy mix are beginning to appear, emphasizing the necessity of bringing into play vast reserves of coal and of ultimate reliance on nuclear fuels for generating electricity.

What happened. The nation faced growing energy problems even before the Middle East

- (1) OECD projected import demand,
\$9 Persian Gulf fob (1972 dollars)
- (2) Ford Foundation Energy Project,
\$6.25 Persian Gulf fob (1973 dollars)
- (3) Brookings Institution,
\$7 Persian Gulf fob (1974 dollars)
- (4) W. J. Levy Consultants,
\$8 Persian Gulf fob (1974 dollars)



	1973	1975	1980	1985	1990
Venezuela	3.5	3.5	3.3	4.0*	5.0*
Ecuador	.4	.5	.5	.5	.5
Indonesia	1.5	1.7	2.0	2.0	2.0
Iran	6.0	7.5	8.5	8.0	7.5
Iraq	2.2	3.0	4.0	5.0	6.0
Kuwait†	3.5	3.5	3.5	3.5	3.5
Abu Dhabi, etc.	2.7	3.5	6.5	7.0	7.0
Libya	3.0	3.0	2.5	2.0	2.0
Algeria	1.1	1.1	1.3	1.5	1.6
Nigeria	2.0	2.5	2.8	2.7	2.6
Saudi Arabia†	8.0	12.0	18.0	20.0	20.0

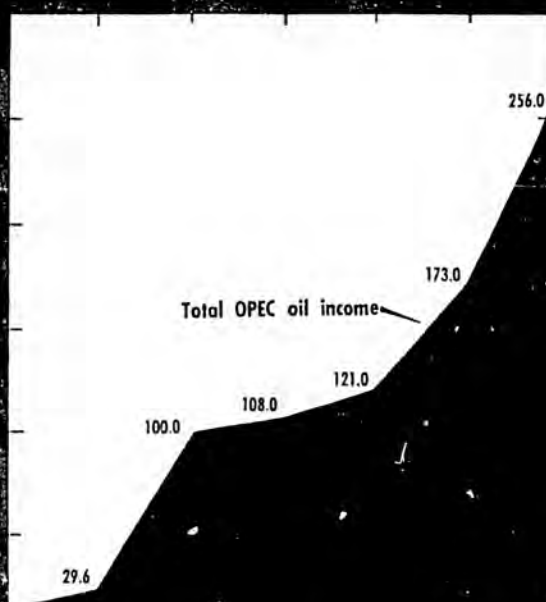
conflict of October 1973 and the embargo that followed.

In the last 15 years, the United States has not adequately developed its domestic petroleum resources, while demand for petroleum continued to rocket upward.

In 1959, for example, 2,074 rotary rigs were active and 51,764 total wells were drilled.

By comparison, in 1973 only 1,194 rigs were active and wells drilled slumped to 27,602. New crude reserves added by exploration in 1959 were estimated at nearly 3.7 billion bbl and by 1973 this had dropped to about 2.2 billion bbl.

The drain on petroleum reserves was enormous. Liquids production increased from 7,933,000 b/d in 1959 to 10,925,000 b/d in 1973;



Year	Payments by		Oil revenues of OPEC countries		Reserves of OPEC countries*
	United States	Other major importers			
1972	\$ 4.91	25.9%	\$ 14.01	74.1%	\$ 18.91
1973	8.51	28.7	21.11	71.3	29.61
1974	25.21	25.2	74.81	74.8	100.01
1975	27.0	25.0	81.0	75.0	108.01
1976	30.3	25.0	90.7	75.0	121.01
1980	43.3	25.0	129.7	75.0	173.01
1985	64.0	25.0	192.0	75.0	256.01

Crude	1970	1971	1972	1973	1974*
Arah light	1.80	2.285	2.479	5.036	11.651
Iran light	1.79	2.274	2.467	5.254	11.875
Kuwait	1.59	2.187	2.373	4.82	11.545
Abu Dhabi Murban	1.88	2.341	2.540	5.944	12.636
Iraq Basrah	1.72	2.259	2.451	4.978	11.672
Qatar Dukhan	1.93	2.387	2.590	5.737	12.414
Iraq Kirkuk	2.41	3.211	3.402	7.10	—
Libya	2.53	3.447	3.673	9.061	15.768
Nigeria	2.42	3.212	3.446	8.339	14.691
Sumatra light	1.70	2.21	2.260	6.00	10.80
Venezuela Tia Juana (31")†	2.193	2.722	2.722	7.762	14.356
Venezuela Cifina†	2.339	2.782	2.782	8.064	14.876
Louisiana	3.69	3.69	3.69	5.29	5.29
East Texas	3.60	3.60	3.60	5.20	5.20
West Texas sour	3.23	3.29	3.29	5.29	5.29

but petroleum demand was still not satisfied. It jumped from 9,749,000 b/d to 17,498,000 b/d. To close the gap, the nation's imports increased from 1,780,000 b/d in 1959 to 6,201,000 b/d in 1973. At this figure, imports represented about 35% of domestic supply.

Impact of the October 1973 embargo was not felt until mid-December because of the long

supply lines to this country from the Middle East. And full effect of the reduced flow came in the first quarter of 1974 when average imports fell some 2.2 million b/d below expectations. The crisis was met only because U.S. consumption at the same time was reduced by 2.7 million b/d through the first quarter.

Economists just now have been able fully to

World energy resources

	Billion (10 ⁹) units	
	Proved and currently recoverable	Estimated remaining recoverable
United States		
Natural gas (1,000 cu ft)	279	1,447
Natural-gas liquids (bbl)	7.3	36
Crude oil (bbl)	38.1	335
Coal (short tons)	197	1,433
Shale oil (bbl)	77	1,068
Bitumens (bbl)	1	2
Uranium oxide (short tons at \$15/lb)	580	1,620
Western Hemisphere (Incl. U.S.A.)		
Natural gas (1,000 cu ft)	407	3,340
Natural-gas liquids (bbl)	N.A.	70
Crude oil (bbl)	78	700
Coal (short tons)	220	2,310
Shale oil (bbl)	130	1,550
Bitumens (bbl)	80	500
Uranium oxide (short tons at \$15/lb)	975	2,470
Europe (Excl. U.S.S.R.)		
Natural gas (1,000 cu ft)	171	400
Natural-gas liquids (bbl)	N.A.	12
Crude oil (bbl)	17.7	135
Coal (short tons)	78	415
Shale oil (bbl)	15	150
Bitumens (bbl)	N.A.	N.A.
Uranium oxide	450	570
Asia-Pacific (inc. Europ. U.S.S.R.)		
Natural gas (1,000 cu ft)	964	4,300
Natural-gas liquids (bbl)	N.A.	128
Crude oil (bbl)	478	1,350
Coal (short tons)	880	5,565
Shale oil (bbl)	35	115
Bitumens (bbl)	N.A.	410
Uranium oxide (short tons)	170	385
Africa		
Natural gas (1,000 cu ft)	193	1,700
Natural-gas liquids (bbl)	N.A.	48
Crude oil (bbl)	58.9	500
Coal (short tons)	10	120
Shale oil (bbl)	10	100
Uranium oxide (short tons)	425	570
Total world		
Natural gas (trillion cu ft)	1,735	9,740
Natural-gas liquids (billion bbl)	N.A.	759
Crude oil (billion bbl)	633	2,685
Syncrude from oil shale and bitumen (billion bbl)	270	2,415
Coal (billion short tons)	1,188	8,410
Uranium oxide (1,000 short tons at \$15/lb)	2,020	3,995

Source: H. R. Linden & J. D. Parent, Institute Gas Technology.

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measure the embargo's impact on the economy. The National Petroleum Council, for instance, reports these effects:

- **Gross national product.** A 7% drop was experienced in GNP during the first quarter, whereas a modest increase generally had been expected. The impact especially was felt in slowed activity in autos, tourism, housing, construction and allied activities.

- **Employment.** The unemployment rate during the first quarter averaged 5.2% of the labor force, up 0.5 percentage points from the preembargo rate.

- **Prices.** The sharp, rapid increases in world oil prices during and after the embargo resulting from producer-country actions raised energy costs through the world economy. Each commodity and service became higher priced depending on its use of energy. About one-fourth of the increase in U.S. wholesale prices in 1974 has been attributed to increased energy costs. The higher price levels have revealed that, contrary to prior opinion, petroleum demand is elastic and to some degree reacts to price.

- **International trade.** The higher world oil prices became a big upsetting factor in changing the balance of payments between oil-producing and oil-consuming nations. In the case of the United States, NPC has estimated that the 1974 dollar outflow attributable to its oil imports will reach \$25 billion and that total funds flowing into the producing countries will approach \$100 billion. The Commerce Department reported that the soaring U.S. oil bill sent this nation's balance of payments into a \$900-million deficit during the first half of this year. The department warned that continued deficits could lead to a weakened U.S. dollar compared with other currencies. This in turn could prompt more devaluations or further inflation in the United States.

A World Bank study projects the U.S. dollar outflow at \$27 billion in 1975 with total OPEC revenues at \$108 billion and U.S. outflow by 1980 at \$43 billion and OPEC revenues at \$173 billion. By 1985, the U.S. oil-import bill may reach \$64 billion and OPEC revenue \$256 billion.

OPEC currency reserves from this vast income will mount to \$653 billion by 1980 and \$1,206 trillion by 1985, according to this study.

The action taken. Americans had four options to meet the oil shortages created by the embargo and in so doing learned some valuable lessons about future approaches.

The options were: cut consumption sharply, convert to alternate fuels, increase domestic production on an emergency basis, and allocate short supplies among consumers on a priority basis.

COAL: the sleeping giant

COAL is the sleeping giant in the world energy picture.

Dr. Karlheinz Bund, chairman of Rurkohle A.G. of Essen, West Germany, predicted at the 9th World Energy Conference in Detroit that technological progress will enable coal to overcome its present handicaps and assume a major world energy role.

Proved and probable coal reserves, according to Dr. Bund, are estimated to be at least 8,000 billion tons.

They amount to some 90% of the world's total fossil energy reserves compared with about 10% for crude oil and natural gas together.

Dr. Bund declared that based on a recovery of only 50% of coal reserves, they will be sufficient for 2,000 more years at the present production level of 2.2 billion tons/year. Even if coal production should be doubled, the reserves still would last about 1,000 years.

Coal reserves are not only abundant, he added, but also favorably distributed where oil and natural-gas reserves are limited and concentrated in a few areas.

However, coal has several severe handicaps regarding extraction and transport. Dr. Bund said these challenges were:

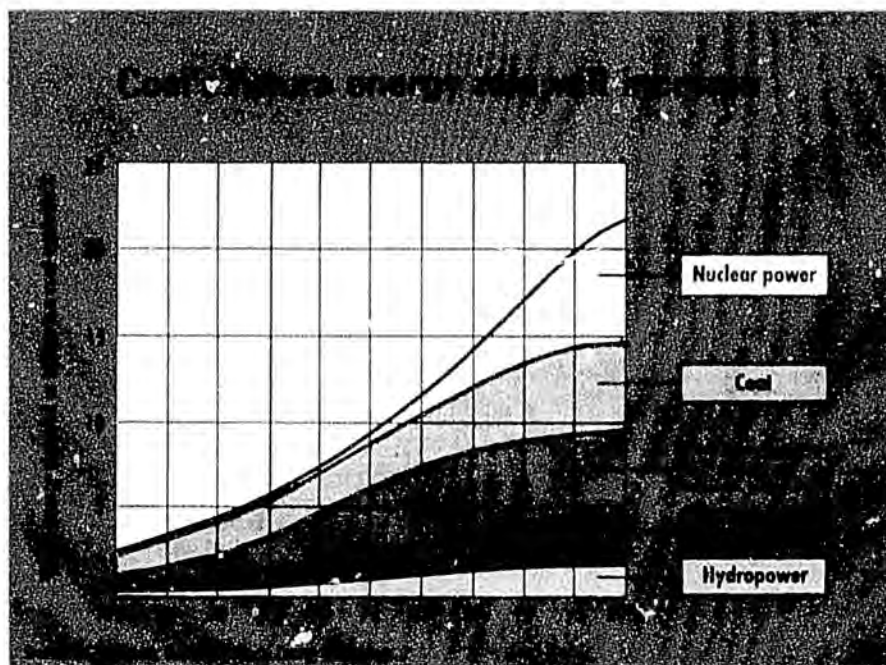
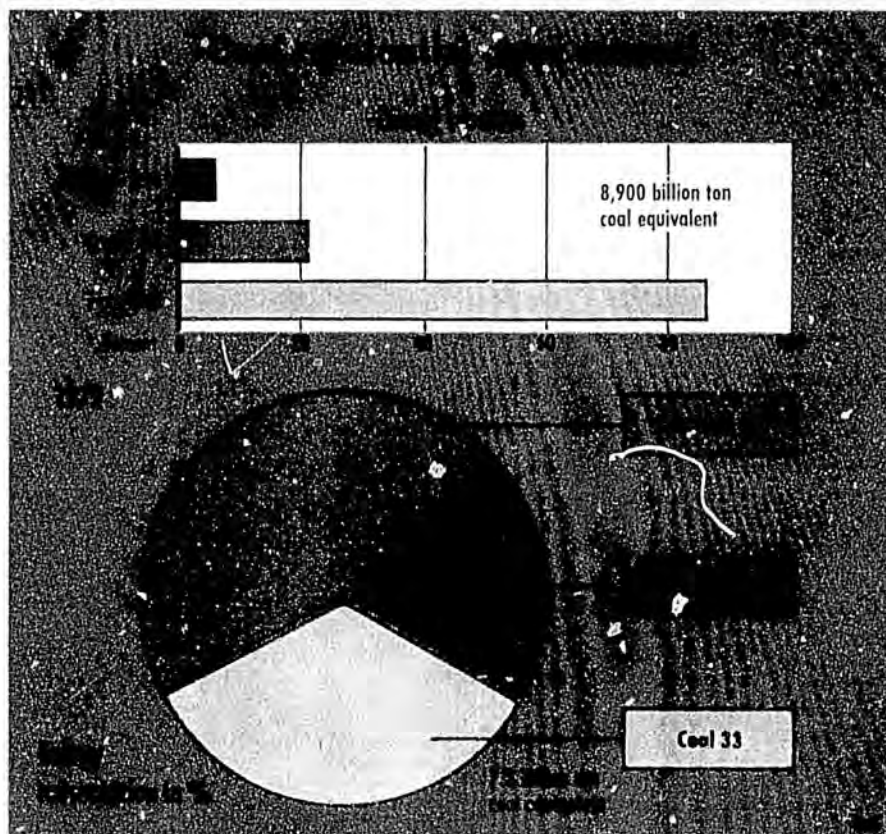
- The extraction and processing of coal is more difficult and labor intensive than the production of oil and gas. But new, and above all, labor-saving technical mining systems must therefore be expeditiously developed, tested, and introduced into the mines.

- The coal-mining industry, particularly opencast mining, is rated as hostile to the environment. New mining methods with appropriate reclamation standards can solve these problems.

- Transportation of coal over long distances is costly and re-

quires a high level of investment. Efficient transport systems must be innovated, making possible a more-economical movement of coal over long distances.

Dr. Bund forecast that new technologies for coal gasification, liquefaction, and use in power generation will allow this fossil fuel to command a substantial energy role.



Due to consumer cooperation and some luck with the weather, Americans cut petroleum consumption by 2.7 million b/d in the year's first quarter. This was accomplished by such voluntary actions as car pooling, reduced space heating and lighting, more-efficient airline operations, etc. Such mandatory actions as reduced speed limits for autos also contributed.

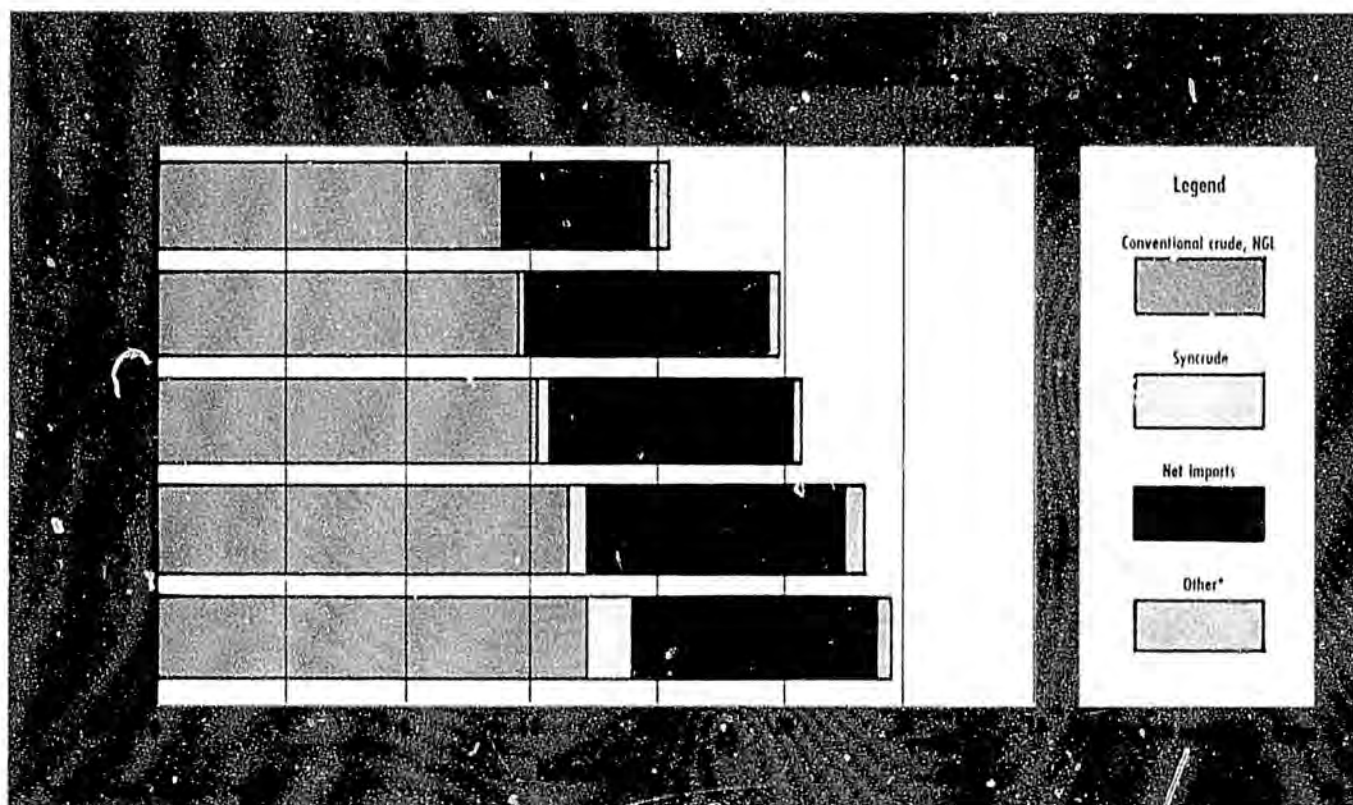
NPC estimated that conservation and curtailment activity reduced consumption by 1,010,000 b/d in the 3 months. The warmer-than-normal weather helped reduce demand by 440,000 b/d. NPC estimated that other factors, such as high fuel prices, lowered economic activity, and unavailability of particular products contributed 1,150,000 b/d to reduced consumption.

Conversion to alternate fuels proved a disappointing factor in the crisis. Switching to coal on short notice proved complicated and

difficult. NPC reported that actual oil savings from this source were only 61,000 b/d. Previous estimates of potential savings were as high as 120,000 b/d. However, imports of electricity from Canada accounted for 26,000 b/d giving a total of 87,000 b/d gained from conversion to or use of alternate fuels. A decline in petroleum exports ran this total to about 100,000 b/d.

The effects on various petroleum products from these cutbacks are interesting. Gasoline took a sharp reduction of 600,000 b/d for the quarter. Aviation fuels demand dropped 19,000 b/d, middle distillates and residual fuels each 780,000 b/d, and other products including exports 35,000 b/d.

Emergency production increases above normal rates were not employed during the short emergency period. A few oil fields in Texas and the Naval Petroleum Reserves were



Workable rigs (year-end)	Historical	Projected		
	1973	1974	1975	1976
Land rigs	1,502	1,502	1,541	1,559
Offshore rigs				
Stationary	75	81	88	96
Mobile bottom supported	58	62	67	77
Floater	15	21	32	41
Total offshore	148	164	187	214
Total all rigs	1,650	1,666	1,728	1,773
Net additions		34	44	45

New rig allocation	Historical	Projected		
	1973	1974	1975	1976
New rigs manufactured				
Offshore mobile	49	50	50	50
Remaining in U.S.		11	17	20
Exported		38	33	30
Fixed	86	112	128	128
Remaining in U.S.		48	52	50
Exported		38	60	78
Total new rigs manufactured	135	162	178	178
Less exports	76	93	108	108
Less attrition	25	25	25	25
Total unavailable	101	118	133	133
Net rig additions	34	44	45	45

considered potential sources of greater production. But these options came a cropper due to a balky Congress and equally reluctant state oil-regulatory agencies.

Instead, the Federal Energy Office undertook the job of allocating available petroleum products to cover essential activities and minimize adverse effects on agriculture and industry.

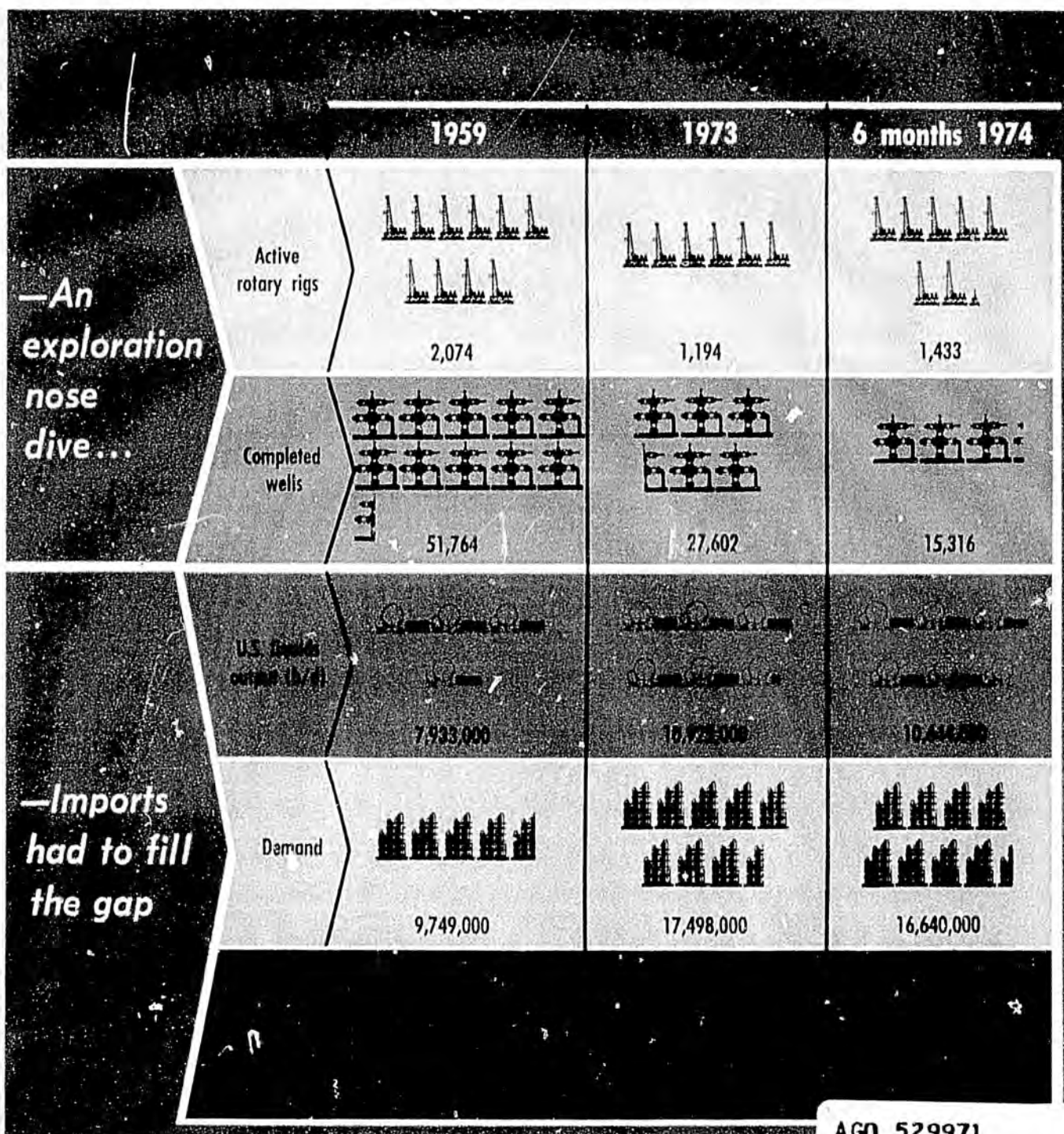
The lessons. What lessons for the future did the U.S. learn from this?

- Emergency conversion to other fuels offers little relief. The greatest opportunities are primarily in the electric-utility sector and even there are quite limited. The future in power generation is away from oil and gas to coal, and this trend will lower potential savings from conversion during an emergency, especially since the same trend also is expected in industry. NPC, however, recommends the Government

encourage dual-fuel capability in industry and environmental variances to permit coal conversion.

- Emergency domestic oil production also will be limited. The potential from existing fields is small and will decline over time as these reserves are depleted. NPC recommends, however, that the federal Government should evaluate the potential of the Naval Petroleum Reserves, complete development of the reserves, and finalize plans for use in an emergency. State and federal agencies also are urged to cooperate in developing acceptable procedures to permit emergency production of other domestic fields to make even this small degree of protection available.

- It's doubtful that voluntary conservation and curtailment measures in the future will result in more savings than achieved early this





COMPLETION of the base for the 360-mile Alyeska haul road to the North Slope paves the way for intensive construction work on the line next year—and for a major boost in domestic oil supply in 1977.

year. Continued high fuel prices, it is felt, will make conservation a way of life in this country, leaving little room for further savings in an emergency. For this reason, NPC believes the nation should develop standby emergency consumption-reduction measures strongly oriented toward consumer education and cooperation. A mandatory rationing system should be carefully developed but its use withheld until the effectiveness of other measures is fully determined.

- **An emergency petroleum-storage system** is a serious need to give the nation adequate time in a crisis to react positively to any cutoff in imports. NPC observes that "efforts to implement such a program should begin immediately because of the long construction lead times involved."

First consideration of the storage system, according to NPC, should be to provide crude-oil security to domestic refiners. It is estimated that 500 million bbl of crude storage when combined with normally available inventories will provide 90 to 180 days of supply for a large percentage range of crude imports presently foreseen.

NPC believes crude storage could be created in Gulf Coast salt-dome projects and integrated with the crude-transportation system serving Gulf Coast deepwater terminals. Storage of fuel oil at strategic locations on the East Coast also would be needed to fit specific circumstances and specific logistical problems.

Important matters to be resolved in any storage system, NPC pointed out, are the extent of government or industry financing and the administration of emergency storage and its fill.

Cost of security storage will be considerable.

The cheapest approach is storage in salt domes which could be provided for 60-85¢/bbl, if the volume to be stored exceeds 100 million bbl. This compares with a cost of \$3.80 to \$7/bbl for aboveground tank storage. Many salt domes on the Gulf Coast are capable of accommodating storage projects of several hundred million bbl and experience with such storage has proven it safe and reliable.

Leaching of several hundred million bbl of salt-dome storage could be completed in about 6 years, NPC estimated. Thus significant storage could be ready to fill about 1979.

The council recommends that security storage should not be drawn down until after (1) a proper declaration of an energy emergency by Government and (2) appropriate voluntary and mandatory standby consumption and reduction measures have been implemented.

New look at demand. Petroleum economists believe the U.S. economy as a result of the Arab action has now entered a transitional period between an era of abundant supplies of cheap energy and an era of high prices and insecure supply.

A sign of the times is what's happening to U.S. oil demand this year. It's experiencing no growth, in fact actually may decline by as much as 2% from 1973, the first downturn in many years. This trend is attributable to physical restraints early in the year and higher prices the rest of the time.

Because of increased drilling and recovery efforts, domestic oil and gas supply should decline at a slower rate this year than earlier anticipated. Import volumes should remain about equal with 1973, allowing the industry to meet current demand and rebuild inventories.

The 1974 demand experience may herald a

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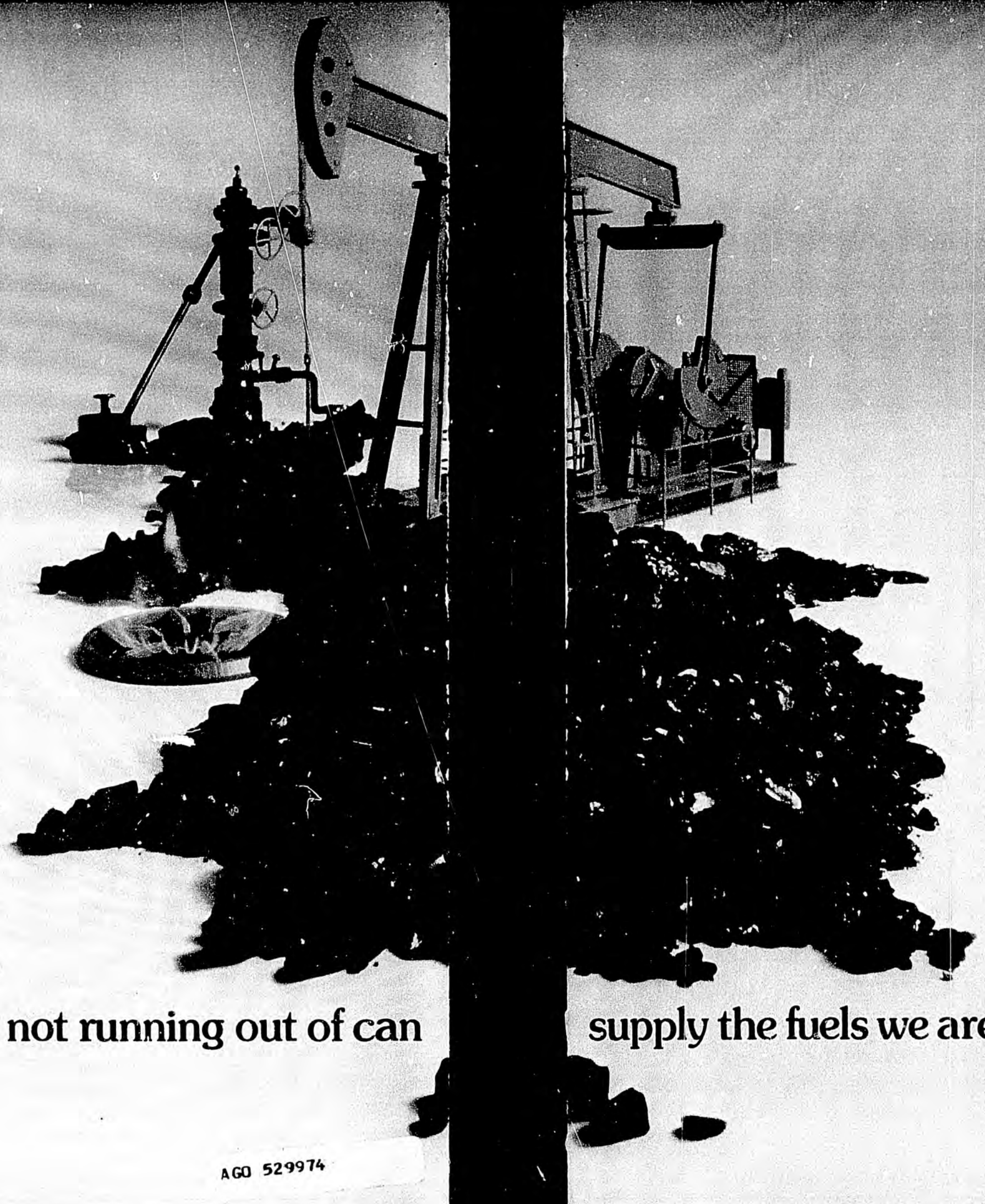
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In the last decade, petroleum and natural gas have been the source for approximately 78% of all the energy consumed in this country. But these are fuels we're running out of. Estimates vary, but at best, present oil and natural gas reserves are limited. We must find new sources for these fuels. New sources of energy.

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Now with the price of imported oil around \$10 a barrel and liquefied natural gas at over \$1 per 1,000 cubic feet, synthetic fuels from coal have become economically feasible. So early in 1974, we created a Synthetic Fuels Department to make the fuel we're not running out of supply the fuels we are running out of.

The fuel we're not running out of can

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Already this department has eight feasibility or pilot study assignments, three of which are under construction. On the horizon are larger demonstration units. Then full-scale commercial plants.

Thanks to Dravo's synthetic fuels skills, coal may be able to help supply the fuels you're running out of. For more information, contact: Dravo Corporation, Synthetic Fuels Department, One Oliver Plaza, Pittsburgh, Pa. 15222.

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distinct slowdown in the growth of petroleum consumption. An NPC future demand study which reflects the opinions of many private observers is based on the assumption that conservation trends will be effective and the economy will just use less energy in the future than previously assumed.

The NPC forecast was put in a framework of three possibilities—high, low and medium range. In the medium case, energy consumption is projected to grow between 1972 and 1985 at an annual average rate of 3.2% with the high range being 3.6% and the low 2.6%. These projections are all below the annual growth rate of 4.5% over the last 5 years and of the 3.7% rate over the last 25 years.

Altered projects are also evident on the supply side. Conventional domestic liquids production is expected to reverse its recent decline and grow at an average rate of 1.3% hitting 13.2 million b/d by 1985 and 13.9 million b/d by 1990. Syncrude is not expected to reach significant volumes until the mid-1980s and should be 1.2 million b/d in 1990.

Imports, in the medium case, should increase gradually from the 1973 level to 8.4 million b/d in 1985 and then gradually decline to 8.1 million b/d in 1990.

Total oil supply in this case should grow at the rate of 2.8% a year reaching 20.6 million b/d in 1980. Then, over the next 10 years, growth rate should ease off to 1.4%/year putting supply at 23.4 million b/d in 1990.

Demand abroad. The same constriction in oil demand taking place in the U.S. this year is occurring throughout the non-Communist world. The Journal's estimate, based on interviews with oil-company economists and market analysts around the world, is for a drop of up to 3% in demand this year versus 1973.

Major consuming countries everywhere are being forced to squeeze the fat out of oil consumption. Balance-of-payments positions in all of them have deteriorated badly. And governmental initiatives have been assisted by the demand-damping effect of soaring prices on the individual consumer.

The Journal sees demand in western Europe as a whole dropping about 7% this year, the U.S. down by up to 20%, and Japan holding about even—despite its almost complete dependence on crude produced by the Organization of Petroleum Exporting Countries cartel. The rest of the non-Communist world will hold about even or perhaps decline slightly.

The Journal forecast assumes normal early-winter weather worldwide, and no coal strike in the U.S. Unusually cold weather in November and December could add some 500,000 b/d to non-Communist fourth-quarter demand.



Likewise, a coal strike in the U.S. would add to demand, forcing increased oil imports and storage drawdowns.

Most market analysts expect demand to turn upward again—though modestly—next year. The composite estimate is for an increase of about 4% over 1974—far below pre-1974 gains.

Analysts all caution that trying to figure demand for 1974—even this late in the year—is difficult. Lack of a firm fix on stocks—especially in western Europe—makes it hard to determine how real demand is. There are no good primary figures available yet, and the volume of oil in secondary stocks is a complete unknown.

As a result, numbers that on their face seem to show a huge slide in demand might reflect in part a drawdown of primary and reseller stocks built up in anticipation of the late-1973 Arab oil cutback.

Future reserves. While the bulk of today's proved reserves is in the Middle East, at least one expert in the field says the bulk of those yet to be found will be proved outside the Middle East.

He is Ygnacio Bonillas, retired Standard Oil Co. of California executive. Bonillas puts current world reserves at 700 billion bbl and undiscovered reserves at 1 trillion bbl.

The Middle East today has 400 billion bbl of proved reserves, or about 60% of the world total. It has only about a third, however, of the undiscovered oil.

The U.S., which has roughly 6% of proved reserves, should contribute about 10% of the undiscovered oil. And a large new chunk, about 25%, will come from the vast but relatively poorly explored Sino-Soviet area, Bonillas predicts.

In the U.S., Bonillas counts on heavy new additions to reserves from Alaska and the Outer Continental Shelf and from a marked increase in percentage of oil recovered of that originally in place.

If the U.S. is to realize its potential in the undiscovered-reserve category, however, Bonillas says, it simply must speed up dramatically its opening and leasing of new geologic provinces. The discovery rate for oil and gas reserves in the U.S. is declining because the industry has been forced to keep on drilling in provinces that keep getting older and older. And with each discovery in such an area, conventional places to drill decline still further.

The U.S., the ex-Socal executive declares, has fallen far behind any other region with offshore potential in leasing its offshore acreage. And the result is, he says, that the U.S. is just not making as many discoveries or finding as much oil as it should.

Bonillas cites the North Sea as an example of comparative leasing practices. Ten times more acreage is under lease in the North Sea than off the U.S.—despite the much larger shelf area

with potential off the U.S. Offshore U.S. production peaked in 1971 at 1.7 million b/d and has been declining since then. In the North Sea, Bonillas says, production may reach 3-4 million b/d by 1980.

Vastly more acreage has been opened to exploration also off Africa, Southeast Asia, Australia, and Canada, although the U.S. has almost as much offshore territory as any of these areas, except for Africa.

Shortage seen for tubular goods

THE National Petroleum Council in a special study of oil-country tubular goods projects a shortage of 157,000 tons in 1974 but estimates supply and demand for steel goods will be in balance for 1975 and 1976.

This year's shortage is the chief factor in an expected drilling shortfall of some 11 million ft or 2,200 wells that possibly could be drilled with present number of drilling rigs.

The accompanying table gives the annual supply-demand breakdown for 1970-76. These considerations, however, should be borne in mind in interpreting the data:

- While total tonnage shipments projections for 1974-76 are believed reasonable, shipments less than estimates could cause a reduction in wells and footage drilled.

- Availability of imports is quite uncertain because worldwide growth in demand has overtaken the world basic steel and pipe-mill capacity. West German mills are committed to deliveries to the U.S.S.R., and substantial sales have been made by Japanese mills to the Peoples Republic of China.

- Oil and gas-well abandonments in the United States are a relatively small but important source of tubing and casing. These used tubular goods now bring prices comparable with new pipe because of the tight supply situation. Oil-well abandonments dropped from around 20,000 in 1972 to under 15,000 in 1973 and are projected to decrease even further. Gas-well abandonments which totaled about 4,000 a year in 1972 and 1973 are also expected to drop somewhat in 1974. The relative economics of abandonments for salvage vs. con-

tinued production will dictate the magnitude of this supply.

- The total tonnage of oil-country tubular goods shipped for domestic use cannot serve as a complete indication of supply-demand balance. The tight supply situation prevailing in 1974 and projected for 1975 includes grade and size availability as well as basic tonnage. All deep wells must use some high-strength casing and, if successful, high-strength tubing.

- The American Iron and Steel Institute indicates about 44% of the casing, tubing, and drill pipe shipped from U.S. mills in 1973 was high-strength material. The need for high-strength pipe is increasing and is projected to continue to rise beyond 1976. Since there is restricted capability for production of this material, there may be a continuing restraint on deep-well drilling.

- Drill pipe is in short supply

but is not a measurable constraint to drilling activity. In 1973, drill pipe represented less than 8% of total U.S. output of high-strength oil-country tubular goods. Drill-pipe manufacture is limited by the capacity of the same equipment that is used to make high-strength casing. The problem of competing for mill space is made more acute because a length of drill pipe requires twice as much mill capacity to produce as a comparable length of high-strength casing. Thus, increases in drill-pipe production at present will reduce the output of twice that length of high-strength casing.

- Present attractive economics should encourage expansion of heat-treating capacity as well as basic carbon-steel tubular production, and only a small increase of both should bring tubular supply into balance with rig availability.

Oil-country tubular goods supply-demand projection

	Thousand tons						
	Historical				Projected		
	1970	1971	1972	1973	1974	1975	1976
Demand*	1,874	1,662	1,816	1,862	2,263	2,359	2,473
Supply							
Mill output	1,307	1,404	1,277	1,436	1,956	2,317	2,432
Mill inventory				300	150		
Less exports	(88)	(81)	(95)	(198)	(300)	(300)	(300)
Plus imports	109	157	158	162	100	100	100
Miscellaneous†	546	182	476	429‡	523	492	341
Total	1,874	1,662	1,816	1,862	2,096	2,359	2,473
Shortage					167		
To inventory§				267	333	250	100

*Based on maximum rig utilization. †Use from inventory, rejects, line pipe used as oil-country goods, secondhand pipe, unreported mill shipments and unidentified imports. ‡Based on 1970-72 average, 23% of demand assumed satisfied from miscellaneous sources. §Domestic shipments to pipe-user inventory. Source: NPC 061

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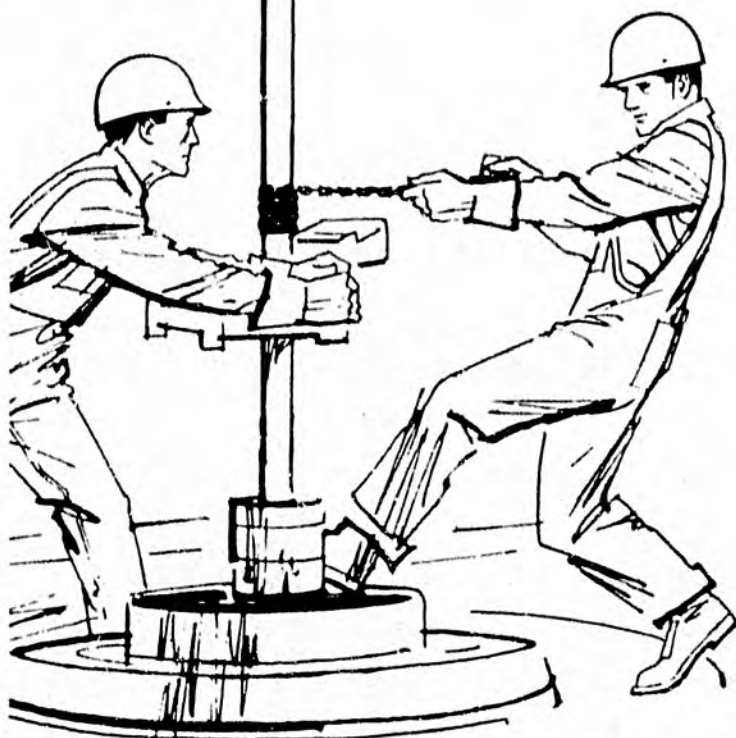
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If the U.S. really wants a pronounced turnaround in domestic oil supply, Bonillas declares, it simply must open up its frontier areas—and at a much faster pace.

The job ahead. The options available to reduce U.S. dependency on overseas oil in an emergency are fairly clear.

In the short term, conservation of energy through more-efficient use of fuels and the ability to convert facilities to alternate fuels are important but at the moment limited. In the long run, a swing to heavy reliance on coal and nuclear energy, both abundant potential energy sources, will be imperative. But in both cases, full development of the nation's remaining petroleum resources is a paramount necessity.

What are the prospects of more oil and gas? They are good. Although critics have expressed disappointment at the failure of domestic oil production to make a dramatic rise in the wake of higher prices, these new price levels have sparked an upturn in drilling. And this is the necessary first step to changing production and reserve trends.

The National Petroleum Council has observed that "positive steps taken by Government, as a result of the Middle East disturbance, are in the direction of increasing the domestic energy supply." Advancing petroleum prices, accelerated offshore leasing, and approval of the Trans-Alaska pipeline have increased domestic activity, it noted.

Time, capital needed. "However, reversing the historic downward trend," NPC declared, "requires a major commitment of capital by the petroleum industry and substantial time before results are evident."

The decline in activity over the last 10 years cannot be reversed overnight. For one thing, available rigs have declined from 2,967 in 1963 to 1,824 in 1973. Many drilling contractors were forced to liquidate for lack of business, and their equipment was either exported or dismantled for spare parts.

Only activity showing any increase during the past decade was in number of gas wells drilled. These increased from some 4,800 wells in 1963 to nearly 6,400 wells last year. This was attributed largely to increased prices for natural gas in the intrastate market and the drilling needed to meet deliverability clauses of gas-sales contracts.

Drilling. The upturn in drilling started late last year and is expected to continue.

The average number of drilling rigs operating in 1973 was 1,194, but by year-end some 1,400 were operating. This level is believed to represent near maximum utilization of workable rigs available at that time, according to NPC.



By mid-1974, however, operating rigs had reached 1,500 with an average of 1,400. Rig activity is expected to rise by 1976, perhaps in 1975, to an average above 1,500, an increase of 27% over the 1973 average.

NPC forecasts that 31,800 wells will be drilled in 1974 compared with 27,551 last year, with footage drilled in 1974 reaching 160 million against 138 million. The industry should drill 33,600 wells and 172 million ft of hole in 1975 and 34,500 wells and 179 million ft in 1976.

Besides constraints imposed by lack of available rigs, domestic operators encountered severe shortages of oil-country tubular goods. NPC estimates these constraints caused deferment in 1974 of some 2,200 wells and 11 million ft of drilling.

The shortages of oil-country tubular goods arose from several causes: the substantial rise in drilling activity, a change in inventory and sales practices by the steel industry, the impact of price controls on the steel industry, and inability of steel mills to increase production rapidly.

Changes in steel-industry supply practices are an important factor in maldistribution of tubular goods. The NPC study explains what happened:

"For many years, the steel industry maintained inventories of oil-country tubulars in several strategic locations near the heaviest drilling activities. The makeup and quantities were based on customers' estimates of requirements and the sales experience of the steel industry.

"During the years of depressed drilling activity, these 'in-transit' inventories were more than adequate. While the convenience and economies to the customer-operator were obvious, the return on investment to the steel industry was unattractive. In the third quarter of 1973, each of the tubular-goods manufacturers announced that mill shipment of oil-country tubulars would be allocated based largely on each customer's purchase history, and that shipments to in-transits would be eliminated. As a consequence, each operator would have to maintain his own inventory.

"An effective drilling program must be backed up by a 'working inventory' of tubular goods, and therefore, a buildup of many individual inventories by oil companies has begun to replace the few strategic large ones. This change has substantially increased the total of

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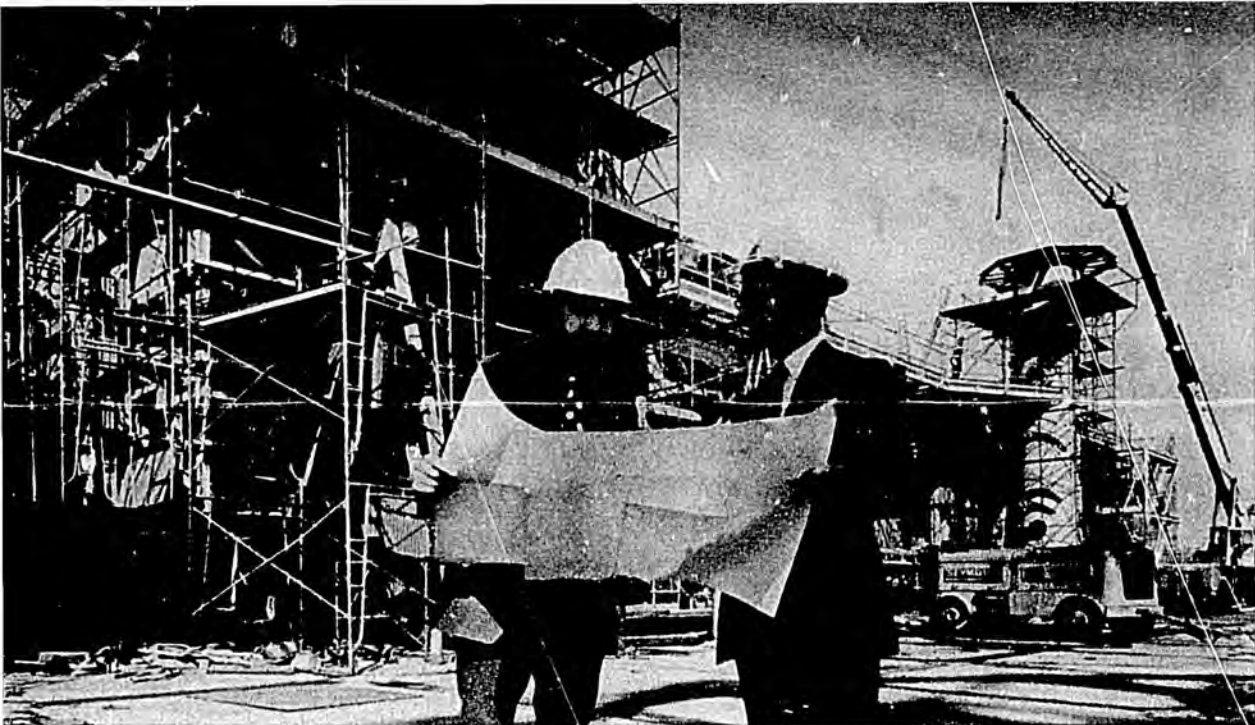
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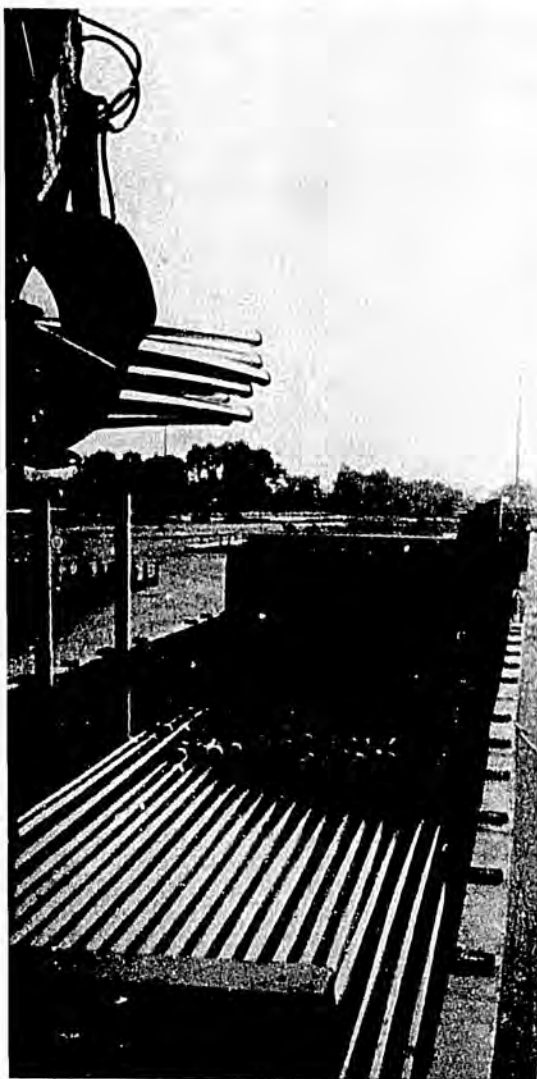
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ION work is humming along the British coast as the first U.K. oil fields in the North Sea gear up production. These North-Sea production modules now are being installed in Shell-Esso team's Auk were built by William Press Production Systems Ltd at its Howdon, Wallsend, yard.



is coming for those U.S. shallow-well drillers handcuffed casing. Output of 4½-in. O.D., the independent's bread and will mount to 5 million ft by year-end from U.S. Steel's plant since its first shipment of this size casing last May.

inventories required overall. This, coupled with the large increase in demand, will cause oil-country tubulars to remain in short supply until the inventory transition is completed.

"With the removal of price controls, increased manufacturing of tubulars has begun which speeded up the inventory transition process. Once the shift is completed, the flow of tubulars for consumption should be adequate to support drilling-rig availability, although spot shortages of high-strength casing will probably continue through 1975."

NPC observes that after 1976 the industry's ability to expand drilling will be limited by capacity to manufacture rig equipment. This could become a serious problem, complicated both by rig-plant capacity and demand for rig exports. Total new rig manufacturing is expected to increase from 135 in 1974 to 162 in 1975 and 178 in 1976; but more than half of these are believed under contract for export. The net rig additions for domestic use thus are expected to be only 34 in 1974 and 44 in 1975 and 45 in 1976.

It is estimated that 250 new rigs will have to be manufactured in 1977 to meet expanded drilling goals and that rig expansion of 30%/year from 1976 through 1980 is necessary to reach a rig level of 2,400 by 1980 required to drill at the projected rate of 250 million ft. This rate of rig additions may not be attainable, and NPC estimates that a growth rate of 10-15% annually after 1976 is more reasonable. This would allow the industry to reach a rig population of 2,900 units and drill 300 million ft by 1985.



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① □ □ ② ⑤
③ ④ NON

DOWN TIME PRODUCTION PUMP UP PRODUCTION

23.25CE4

SET DOWN TIME MINUTES	SET MIN PRODUCTION %	SET PUMP UP TIME MINUTES	SET NO. OF CYCLES
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AUTO
OFF
MANUAL



RESET



AGO 529985

However, whether these drilling goals are reached depends on rig manufacturers expanding plant capacity quickly and they cannot make decisions for the required capital investments unless assured of a continuing high level of demand for many years.

There are shortages of other materials, supplies, and equipment involved in expanding drilling—such diverse items for instance as barites, chemicals, frac sand, and wire rope. And demand is exceeding supply of pumping units and servicing rigs.

A similar situation on tubular goods, rigs, other equipment and supplies generally applies to industry activities in other areas of the world. The industry has the capability to search for oil around the world given the right economic climate and governmental cooperation.

What about oil. The big question remains: Is there enough oil and gas left to fill the world's energy needs?

For a generation, yes. Perhaps longer depending on the type of discoveries. But oil and gas are wasting resources with limitations. Eventually, the world will have to undergird its energy structure with other sources. Steps to develop these alternate sources should begin in earnest now.

A recent study made by the Institute of Gas Technology in Chicago and reported to the World Energy Conference in Detroit revealed vast world petroleum resources. It showed 633 billion bbl of oil currently proved and recoverable and another 2,685 billion bbl remaining recoverable. For natural gas 1,735 trillion cu ft is proved and recoverable and 9,740 trillion cu ft is remaining recoverable. In addition 270 billion bbl of syncrude from oil shale and bitumen are proved and 2,415 billion bbl remaining recoverable.

This study reports the United States has more than 38 billion bbl of proved oil reserves and 279 trillion cu ft of gas with 335 billion bbl of oil and 1,447 trillion cu ft of gas yet recoverable. Europe and Asia have 478 billion bbl of oil proved and 1,350 billion bbl recoverable with 964 trillion cu ft of gas proved and another 4,300 trillion recoverable. Africa has 58.9 billion bbl of proved oil reserves and 500 billion bbl recoverable with 193 trillion cu ft of gas proved and 1,700 trillion cu ft recoverable.

The United States stands in the best position of all major industrialized nations, with several unexplored potential petroleum areas. Although Gulf Coast offshore potential may level out in a few years, much importance is attached to continental shelf areas off the East Coast, Pacific Coast, and Gulf of Alaska.

A giant new field already has been discovered



in the Pacific waters off Santa Barbara where development will resume this year following a prolonged shutdown for environmental reasons. But new reserves elsewhere in the Pacific and off the Atlantic shores will take years to discover and to develop.

Alaska's North Slope will come into production in 1977, probably with an initial output close to 2 million b/d. Once the oil pipeline is built and the gas pipeline is under construction, further exploration will resume along the northern continental shores from Point Barrow to the Mackenzie Delta and beyond.

This Arctic region has great significance for the medium-range or long-range future. The technical know-how now being developed along Alaska's North Slope and into Canada's High Arctic Islands will find application off the



NORTH SEA reserves figures grow more impressive daily. And 1974's exploration bag includes the sea's biggest field yet—Statfjord in Blocks 33/9 and 33/12 in Norwegian waters. Production tests by the Mobil group at above well and two stepouts led to Norway industry ministry reserve estimate of 2 billion bbl of oil and 1.76 trillion cu ft of gas.

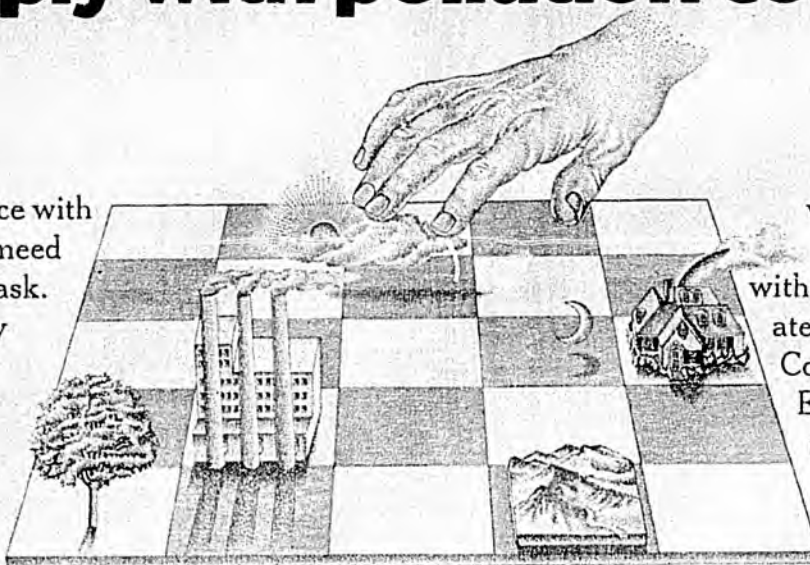
Why move heaven and earth to comply with pollution controls?

Achieving compliance with environmental laws need not be a Herculean task. But without properly managed programs and acceptable environmental studies, financial resources can be wasted.

For superior accuracy and reliability in environmental assessments, industry and government are both depending on Environmental Research & Technology. ERT has proven many times that its methods for environmental modeling, monitoring, analysis and prediction set the standards for cost effectiveness in environmental diagnosis.

When a planned activity's total environmental effect must be evaluated, ERT offers complete environmental impact assessment. ERT provides precise appraisals of the impact of design, construction and future operations of any industrial project. Because of the close liaison ERT maintains between the project sponsor and the regulatory agencies, several of ERT's assessment efforts have resulted in landmark permit approvals within very short time spans.

The company's staff of over 350 includes experienced specialists in every major discipline of environmental science. ERT uses many specially developed state-of-the-art mathematical models to provide quantitative predictions of the impact of future developments. Typically, ERT specialists first model the current conditions in an area, then validate the model through carefully designed monitoring and advanced analytical techniques. The



validated model can then be used with confidence to evaluate future conditions. Consider AIRMAP®, ERT's real-time air quality and meteorological network. Using

analytical instrumentation, telemetry equipment and computer software programs, AIRMAP provides highly reliable measurements of current air quality and very accurate predictions of air quality up to 30 hours in advance. The same talent and technology responsible for the integrated AIRMAP programs is also available in its component parts — air diffusion analysis, stack and ambient air monitoring, and air quality impact assessments.

The company's bioassay techniques, chemistry and biology laboratories, and general field experience are valuable to every aspect of water quality evaluation. Specially designed software is merged with comprehensive data gathering to simulate the effects of industrial effluents on water quality. Unique mathematical models provide an assessment framework for evaluating the physical, chemical and biological integrity of water bodies. In addition, ERT has developed advanced techniques to analyze the hydrologic cycle, including precipitation, runoff, percolation through the soil and groundwater movement.

For more information on ERT and its leadership in the field of environmental science and technology, write Ms. Karen Mathiasen, Marketing Services, Environmental Research & Technology, Inc., 696 Virginia Road, Concord, MA 01742.



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North Cape of Norway and into the waters surrounding Greenland and the Svalbard or Spitzbergen group of islands.

In more-immediate prospect, however, is additional output from established oil-producing areas across the United States. In the past 115 years, a grand total of about 60 billion metric tons of oil has been discovered. Of that, about 14 billion tons has been produced and consumed. Of the remaining oil known to be in place, roughly 4.8 billion metric tons can be economically recovered at prices that were effective in 1972.

Now that new U.S. oil has increased in value to more than \$10/bbl, more of the remaining oil can be recovered by various means. Some engineers estimate the target for eventual recovery at nearly 7 billion tons or 50 billion bbl.

Add to that prospects that were not explored or developed when oil prices were lower. Add further, marginal oil sands bypassed in thousands of wells.

None of these measures toward added recovery will contribute tremendous volumes individually. But when extrapolated by the multitude of prospects, such efforts by thousands of producers—coupled with vigorous offshore exploration and development—could reverse the U.S. oil decline. That is if the incentives remain.

North Sea spreads. Among the other industrialized nations with excellent oil and gas prospects relative to their own domestic needs stand Britain and Norway. They share the bulk of the new oil development in the North Sea.

The Netherlands enjoys a strong natural-gas position; and Germany, France, and Italy retain oil and gas potential which was by and large neglected during the lush period of cheap, plentiful foreign oil. Only Japan of all the major importers has little recourse for offsetting the economic drain with domestic output.

The North Sea is a prime example of what can happen. As one success follows another in oil and gas exploration in the waters of northwestern Europe, it is no longer appropriate to confine attention simply to the North Sea.

Hydrocarbons have now been reported in the Atlantic west of the Shetland Islands, in the Celtic Sea off southern Ireland, and in the Norwegian Sea between Norway and Greenland.

Proved gas reserves in the United Kingdom alone now stand at about 1.2 trillion cu m with potential in all British waters estimated at 3.3 trillion cu m, or in American terms 116 trillion cu ft.

Oil discoveries in the British and Norwegian sectors of the North Sea show even greater promise of improving Europe's energy self-sufficiency. On the U.K. side, existing reservoirs

indicate an annual production rate of 100 million tons or 2 million b/d by 1980. This may be doubled with new discoveries by 1983.

Norway's output, primarily from Ekofisk will approach 15 million tons next year together with about 40 million cu m of associated gas pipelined to the German coast.

Altogether, the North Sea is hailed as Britain's salvation in the current energy crisis, and its promised output will go far to aid all of Europe in a difficult period.

The new order of energy planning in the European Community calls for a daring, threefold increase in the use of natural gas from all sources by 1985. This would require the doubling of domestic production within the nine nations. Oil will remain the principal fuel as imports are supplanted by increasing production from the North Sea and elsewhere. But oil's share of total energy will decline from today's 58% to less than 40%, while natural gas assumes second position at 25% of total energy. European producers feel that these ambitious goals may be met on natural-gas production and usage by 1985.

The opportunities for successful petroleum exploration in many areas of the earth remain enormous in future potential.

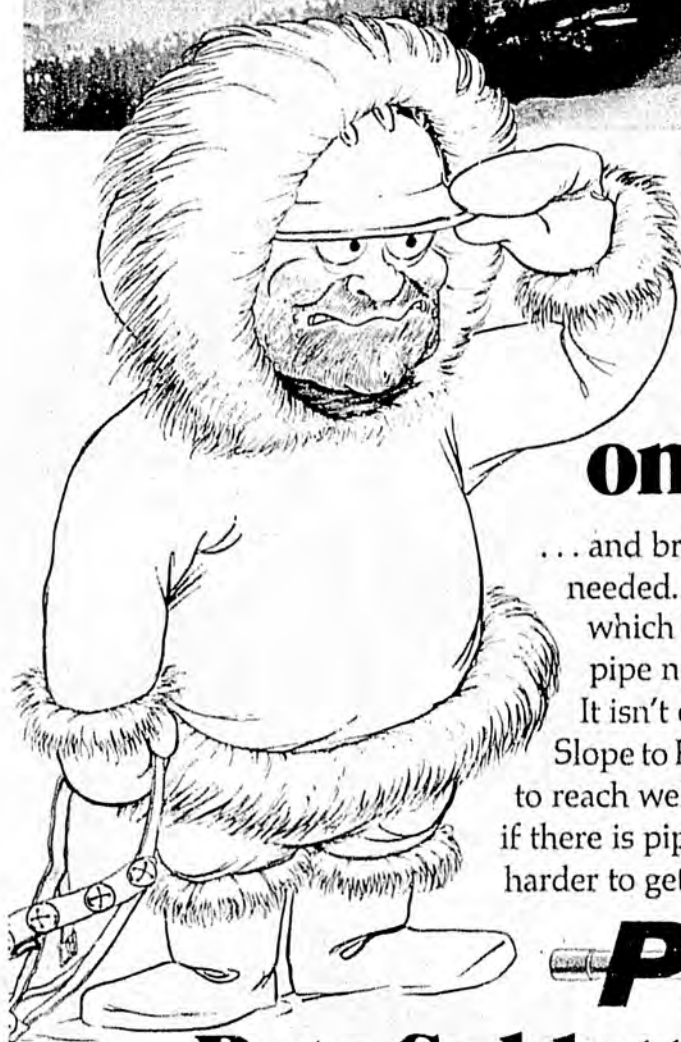
Productive capacity. Of more critical near-term importance, perhaps, is productive capacity. And here's where the U.S. is really hurting. U.S. spare producing capacity has vanished. Only a handful of U.S. fields could produce substantially more oil than they are producing now. And most if not all of them are blocked from doing so in short order because of legal or physical bottlenecks. More oil is being produced than is being found. And Lower 48 production continues its slow decline.

On the other hand, the 11 member countries of the Organization of Petroleum Exporting Countries are adding rapidly to total OPEC producing capacity—whether or not they choose to use it.

FEA credits OPEC with productive capacity in 1973 of 33.9 million b/d. By 1975, FEA predicts, this figure will soar to 41.8 million b/d, and on up to 52.9 million b/d by 1980—with a comparative leveling off then for the next 10 years to 56.2 million b/d in 1985 and 57.7 million b/d in 1990.

The biggest single contributor to the OPEC climb will be Saudi Arabia. FEA plots the Saudi gain from 8 million b/d in 1973 to 12 million in 1975, 18 million in 1980, reaching 20 million in 1985 and holding there through 1990.

Other big gainers include Abu Dhabi and its Trucial Coast neighbors and Iraq. FEA sees Abu Dhabi et al jumping from 2.7 million b/d in 1973 to 7 million b/d in 1990 and Iraq gaining



We located surplus oil well casing on the North Slope.

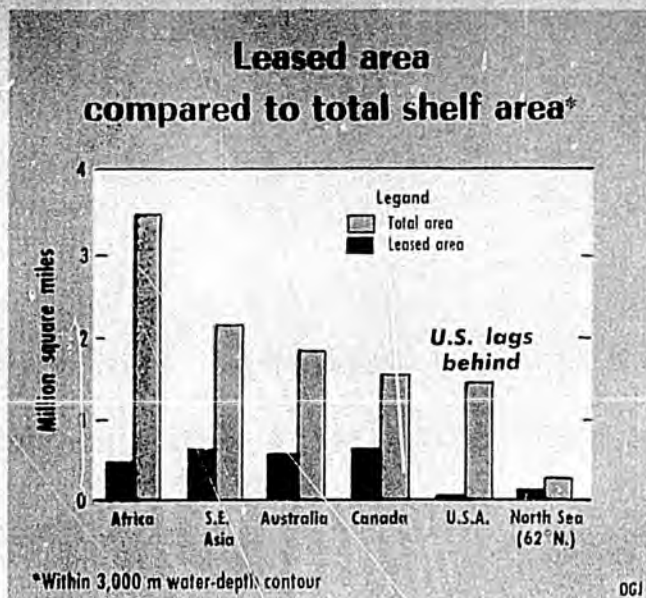
... and brought it back to the "Lower 48" where it was needed. This is an extreme example of the lengths to which Pete Sublett & Co. will go in order to meet the pipe needs of the American oil and gas industry.

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from 2.2 million to 6 million over the same period.

Modest gains are seen for Nigeria, Algeria, Iran, Indonesia, and Ecuador. Venezuelan capacity is seen dropping by 1980 then turning upward—but only if she begins development and production by then from the Orinoco heavy-oil belt.

Kuwait is forecast to hold steady at 3.5 million b/d of capacity. The only loser among the OPEC clan, FEA predicts, will be Libya which is expected to drop to 2 million b/d by 1990 from 3 million b/d in 1973.

U.S. decline slowed. While production (and productive capacity) continues to drop in the U.S., the drop is less steep than it would have been had not higher crude prices been permitted.

A broad Journal survey of U.S. oil companies came up with estimates ranging up to 200,000 b/d as the added volume of oil being produced Oct. 1 as a direct result of improved prices. That's some 2.27% of current total output of about 8.8 million b/d of crude and lease condensate. The consensus puts the figure at 100,000-200,000 b/d.

The impact of higher prices, however, is just beginning to show. All companies—from majors to the smaller independents—agree that the impact will balloon with time as new fields are developed and new enhanced-recovery projects begin to pay off.

In general, oil companies expect to see an increase in U.S. production (excluding the Alaskan North Slope) in the 1975-79 timeframe. The delay is due to the lengthy lead times required to bring new production on stream to make up for normal declines in existing wells.

Examples of industry response to higher crude prices are many and varied. They include:

- Accelerated exploration and leasing of wildcat acreage.



- Drilling of wildcat prospects and proved leases that were ignored or considered marginal at best under old prices.

- Expansion of secondary-recovery projects and stepped-up research on tertiary methods designed to increase ultimate recovery from known fields.

- Reactivation of wells that had been temporarily abandoned because they no longer were profitable at old prices.

- Lengthened life for stripper wells.

Cost is high. The industry must find over 600 billion bbl of reserves in the world between 1970-1985 to keep pace with demand, according to projections of Chase Manhattan Bank. That is about equal to present estimated proved world reserves.

The bank breaks down estimated capital costs for this tremendous task like this: About \$400 billion to find these reserves and prepare wells for production and \$370 billion for capital items beyond the wellhead, for a total of \$770 billion. Other miscellaneous capital spending and debt service will boost that to \$1.2 trillion in current dollars. A 10% annual inflation rate would increase this to \$2.2 trillion over the 15-year period and a 15% inflation rate would put the total cost at \$3.1 trillion.

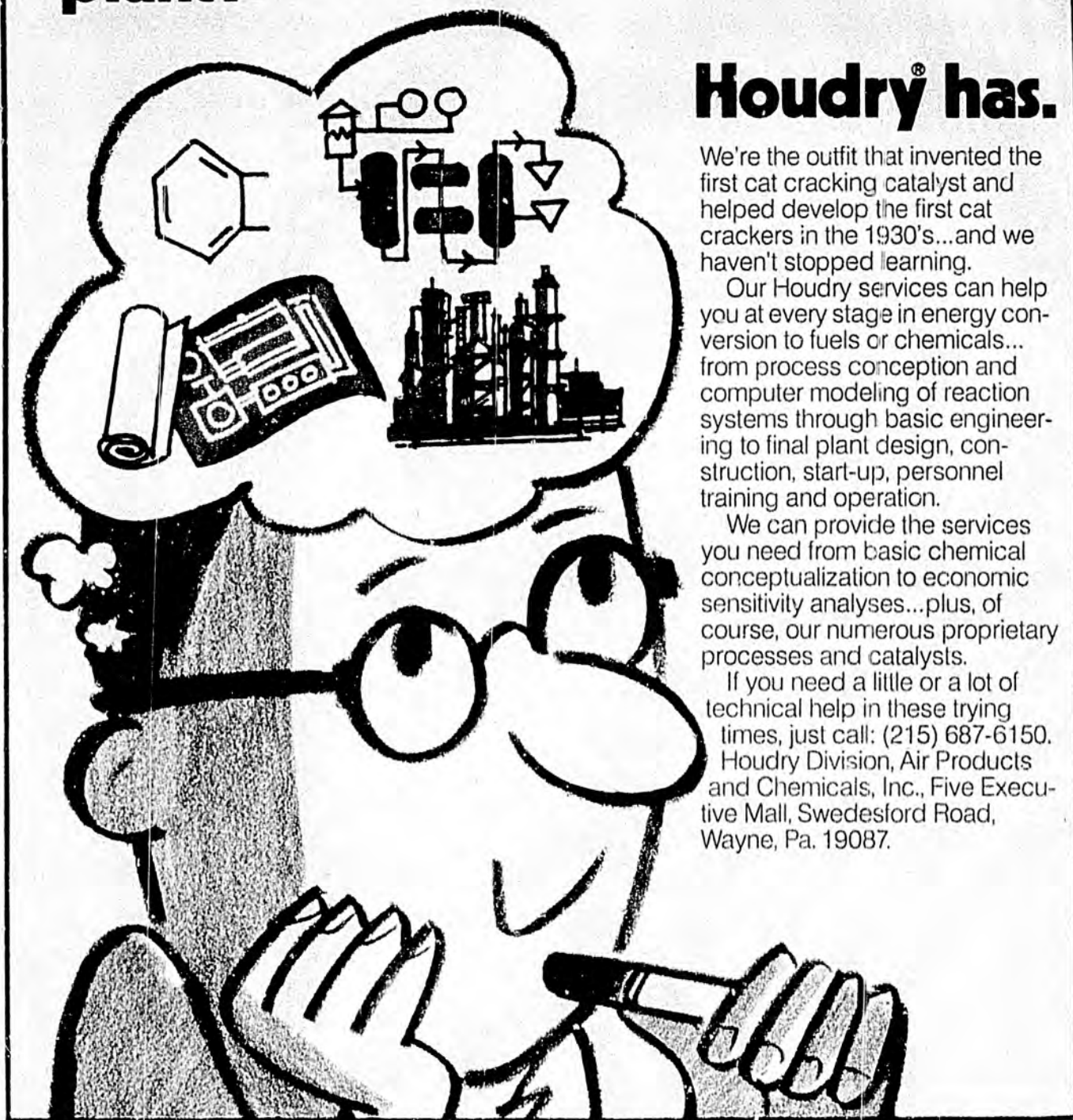
Of the original uninflated \$1.2 trillion, some \$460 billion in terms of current dollars must come from profits, and at the 10% inflation rate this figure would rocket to \$900 billion. If this inflated figure is attained, the oil industry would need profit growth of 21% a year based on 1970 earnings and 17% a year based on 1973's higher profits.

Some of the capital-spending categories are staggering. In the exploration area, nearly \$150 billion would go for drilling contractors' on such items as platforms, workboats, other offshore vehicles, and services. Another \$67 billion would go for drilling contractors' services and \$54 billion for lease equipment. Processing facilities would require \$156 billion of which \$110 billion would go for conventional refineries. Pipelines would take \$36 billion.

Can this huge amount of capital funds be generated? Probably. Speaking only of the situation in the United States, the National Petroleum Council recently observed:

"It appears that adequate capital will be available to the petroleum industry to expand exploration and drilling in line with availability

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of equipment and manpower during the 1974-76 period. Longer range, free-market prices of domestically produced hydrocarbons will be needed to generate sufficient internal capital to attract enough outside funds to increase exploration and drilling within the United States.

"Similarly, capital formation of all segments of the petroleum-service industry appears adequate to provide equipment and supplies for increased operations through 1976. But for the longer term, a clear energy policy leading toward increased development of indigenous energy supplies must be set forth to assure the service industry of steadily rising profits so that adequate plant expansion can begin soon and be financed."

The alternatives. The only real alternative for the United States and other consuming nations aside from developing greater domestic oil and gas resources is developing other sources of energy.

Reducing consumption or storing reserve supplies are short-term options. They are necessary. But used alone, conservation could adjust demand to supply only at heavy cost to human well-being and prosperity.

John W. Simpson and Philip N. Ross of Westinghouse Electric Corp., speaking to the World Energy Conference, declared that "at current growth rates, the world is simply running out of oil and gas. Since these are the fuels on which we depend for almost two-thirds of our energy needs, their potential depletion, as well as their current shortage, defines the true nature of the energy crisis.

"We must sharply reduce our disproportionate dependence upon oil and gas," they said, "by shifting to energy sources that are more plentiful—uranium and coal."

Nuclear admittedly is the greatest hope in long range. It already is accelerating under the new order of energy self-sufficiency. The European Community, for example, only recently stepped up its plans to multiply present nuclear capacity by a factor of nearly 20 by 1985. Electricity from the atom will meet 17% of Community needs by then compared with 1.5% now. The United States is off to a slower start, planning a ten-fold increase by that date.

These are impressive figures, but nuclear power will not become an important energy factor until much later. When Europeans and Americans join in learning how to harness the

fast-breeder reactor and eventually nuclear fusion, giving mankind the same power that energizes the sun, a new era in world energy will have arrived.

Coal is widely hailed as the most plentiful fossil fuel. But in recent years, competition from lower-cost oil and more recently new environmental restrictions have contributed to a steady downturn in coal production in Europe. In the Netherlands, the last coal mine is due for closing shortly. German production is declining at about 10%/year with total output approaching the 100-million-ton level. French and Belgian production follow the same downward trends. In the U.S., with more coal reserves than all other Western industrialized nations, a similar decline resulted many years ago from the inroads made by domestic oil and particularly by natural gas priced too cheaply because of federal regulation.

Coal recently seemed ready for a strong revival. Then along came new environmental laws which denied to coal many of the markets it had managed to retain. The outlook today for reversing the coal-production trend is not good. Despite the ambitious U.S. Government program for increasing output from the present 550 million tons/year to 1 billion tons by 1985, the coal industry is still bound in inaction. Price restrictions were recently lifted, but all the other impediments remain.

The escalated prices for oil have made coal potentially competitive throughout the world, but the problems of accelerating coal production are staggering, forcing this resource to rank as a long-range option.

Other alternate hydrocarbons in the form of shale oil and tar sands show some promise in North America. Their potential contributions to energy supply, of course, cannot help Europe directly. But to the extent that they permit the withdrawal of the U.S. from buying competition for world oil, they remain of interest in Europe.

The reserves of these alternate American fuels are impressive. But the rate at which they can be produced entails significant limiting factors. Shale-oil production in the Rocky Mountains will be hampered by environmentalists, shortages of capital, and shortages of process water. The most optimistic outlook is for an ultimate production rate of about 1 million b/d. The Canadian tar sands may do better than that, but they suffer the problems of remoteness, high capital, and possible national export curbs.

With all the limitations shared by nuclear power, by coal, and by alternate fuels, the greatest portion of the short-term energy load remains where it has been for years—with conventional oil and natural gas.

END

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Worldwide crude production

(Daily average in thousands of bbl)

	Sept. 1974	Aug.* 1974	Daily prod. 1973	Daily prod. 1974	9-month average Change from Vol %	
WESTERN HEMISPHERE						
Argentina	405.0	405.0	418.0	411.0	- 7.0	- 1.7
Bolivia	50.0	50.0	47.0	49.0	2.0	4.3
Brazil	170.0	170.0	169.0	171.0	2.0	1.2
Canada	1,615.0	1,644.0	2,127.0	1,728.0	-399.0	-10.1
Chile	30.0	30.0	32.0	29.0	- 3.0	- 9.4
Colombia	170.0	170.0	199.0	177.0	- 22.0	-11.1
Ecuador	115.0	110.0	203.0	181.0	- 22.0	-10.8
Mexico	580.0	580.0	460.0	568.0	108.0	23.5
Peru	75.0	75.0	68.0	76.0	8.0	11.8
Trinidad	180.0	180.0	165.0	176.0	11.0	6.7
United States	8,340.0	8,926.0	9,210.0	8,945.0	-265.0	- 2.9
Venezuela	2,770.0	2,859.0	3,365.0	3,026.0	-339.0	-10.1
Total	14,994.0	15,199.0	16,463.0	15,537.0	-926.0	- 5.6
WESTERN EUROPE						
Austria	45.0	45.0	49.0	46.0	- 3.0	- 6.1
Denmark	4.0	4.0	4.0	4.0		
France	25.0	25.0	26.0	23.0	- 3.0	-11.5
West Germany	120.0	117.0	131.0	122.0	- 9.0	- 6.9
Italy	20.0	20.0	15.0	19.0	4.0	26.0
Netherlands	39.0	25.0	30.0	30.0		
Norway	50.0	47.0	36.0	30.0	- 6.0	-16.7
Spain	40.0	40.0	14.0	41.0	27.0	192.9
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	65.0	65.0	67.0	68.0	1.0	1.5
Total	410.0	390.0	374.0	385.0	11.0	2.9
MIDDLE EAST						
Abu Dhabi	1,412.0	1,479.0	1,342.0	1,484.0	142.0	10.6
Bahrain	67.0	66.0	68.0	67.0	- 1.0	- 1.5
Dubai	235.0	243.0	238.0	232.0	- 6.0	- 2.6
Iran	5,836.0	5,956.0	5,807.0	6,074.0	267.0	4.6
Iraq	1,604.0	1,718.0	1,939.0	1,770.0	-169.0	- 8.7
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,225.0	2,068.0	3,122.0	2,627.0	-495.0	-15.9
Oman	285.0	289.0	290.0	294.0	4.0	1.4
Qatar	515.0	516.0	591.0	518.0	- 73.0	-12.4
Saudi Arabia	8,780.0	8,276.0	7,845.0	8,429.0	584.0	7.4
Sharjah†	60.0	60.0		20.0	20.0	
Syria	150.0	150.0	150.0	150.0		
Turkey	65.0	65.0	65.0	65.0		
Total	21,334.0	20,986.0	21,557.0	21,830.0	273.0	1.3
ASIA-PACIFIC						
Afghanistan	0	0	0	0	0	0
Australia	471.0	290.0	368.0	363.0	- 5.0	- 1.4
Burma	20.0	20.0	20.0	20.0		
Brunei-Malaysia	378.0	375.0	314.0	367.0	53.0	16.9
India	150.0	150.0	148.0	149.0	1.0	0.7
Indonesia	1,420.0	1,350.0	1,299.0	1,459.0	160.0	12.3
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.0	8.0	8.0	8.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,464.2	2,210.2	2,174.2	2,383.2	209.0	9.6
AFRICA						
Algeria	900.0	950.0	1,123.0	1,077.0	- 46.0	- 4.1
Angola	20.0	20.0	14.0	20.0	6.0	42.9
Cabinda	150.0	150.0	137.0	149.0	12.0	8.8
Congo	40.0	40.0	39.0	38.0	- 1.0	- 2.6
Egypt	172.0	170.0	207.0	133.0	- 74.0	-35.7
Gabon	210.0	210.0	143.0	182.0	39.0	27.3
Libya	1,325.0	1,273.0	2,259.0	1,656.0	-603.0	-26.7
Morocco	2.0	2.0	2.0	2.0		
Nigeria	2,294.0	2,299.0	1,995.0	2,269.0	274.0	13.7
Tunisia	95.0	94.0	83.0	79.0	- 4.0	- 4.8
Total	5,208.0	5,172.0	6,002.0	5,605.0	-397.0	- 6.6
COMMUNIST						
China	900.0	900.0	860.0	900.0	40.0	4.7
Rumania	290.0	290.0	283.0	290.0	7.0	2.5
U.S.S.R.†	9,393.0	9,042.0	8,496.0	9,091.0	595.0	7.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,693.0	10,342.0	9,739.0	10,391.0	652.0	6.7
WORLD TOTAL	55,103.2	54,299.2	56,309.2	56,131.2	-178.0	- 0.3

*Figures adjusted †On stream July 1974. ‡Includes gas liquids.

Worldwide gas production

	(billion cu ft)		1974 cum.
	Sept.	Aug.	
Argentina	32.4	24.0	204.1
Bolivia	12.6	11.6	113.1
Brazil	4.2	4.0	35.4
Canada	290.9	268.3	2,436.6
Chile	21.7	11.9	153.6
Colombia	9.6	4.6	76.0
Ecuador	0.8	0.8	4.4
Mexico	59.0	59.0	506.9
Peru	6.4	6.4	54.2
Trinidad	9.9	4.7	52.7
United States	1,826.7	1,824.7	16,483.3
Venezuela	146.8	41.0	1,321.2
Total	2,421.0	2,261.0	21,441.5
Austria	5.7	5.3	72.6
Denmark	0	0	0
France	24.2	28.3	218.1
West Germany	57.9	59.7	521.7
Italy	45.1	58.2	456.3
Netherlands	229.5	135.3	2,157.4
Norway	0	0	0
Spain	0	0	0
United Kingdom	83.3	137.9	998.0
Yugoslavia	3.8	4.2	40.0
Total	449.5	428.9	4,464.1
Abu Dhabi	0	0	0
Bahrain	0.2	0.3	3.0
Dubai	0	0	0
Iran	75.6	151.3	680.4
Iraq	9.7	10.0	96.1
Israel	0.1	0.2	3.6
Kuwait	0.2	0.2	1.3
Oman	0	0	0
Qatar	0.1	0.1	1.4
Saudi Arabia	0	0	0
Sharjah†	0	0	0
Syria	0	0	0
Turkey	0	0	0
Total	85.9	162.1	785.8
Afghanistan	7.8	7.8	69.6
Australia	14.8	15.9	116.9
Burma	0.4	0.5	4.3
Brunei-Malaysia	0.2	0.3	1.2
India	0.4	0.2	14.0
Indonesia	13.7	1.7	108.0
Japan	8.0	8.5	74.1
Pakistan	11.2	11.1	101.8
Taiwan	3.2	4.1	32.7
Thailand	0	0	0
Total	59.7	50.1	522.6
Algeria	1.6	0.9	15.4
Angola	4.9	2.8	25.7
Cabinda	0	0	0
Congo	0.6	0.6	4.2
Egypt	5.0	5.7	35.2
Gabon	1.3	1.3	10.7
Libya	4.6	4.3	31.6
Morocco	2.5	6.6	22.8
Nigeria	5.8	4.6	44.2
Tunisia	3.6	0.2	8.4
Total	29.9	27.0	198.2
China	16.0	16.8	141.5
Rumania	97.4	77.1	699.8
U.S.S.R.†	760.0	758.9	6,725.7
Other	42.7	26.9	376.3
Total	916.1	879.7	7,943.3
WORLD TOTAL	3,962.1	3,808.8	35,355.5

AGO 529993

328.5 mil bbl/yr

Total wells drilled in the United States*—September 1974†

Data compiled by API

State-district	Total completions							Total exploratory wells†				
	Oil‡	Gas§	Dry holes	Total wells**	Total footage	Total wells all types‖	Total footage‖	Oil‡	Gas§	Dry holes	Total wildcats	Footage
Alabama	1	2	5	8	57,499	8	57,499	..	1	4	5	36,513
Alaska	2	..	1	3	18,153	3	18,153	..	..	1	1	7,954
Arkansas	9	4	15	28	150,374	28	150,374	..	..	5	5	32,040
California	164	5	33	202	506,251	207	528,539	6	1	20	27	159,419
North	..	4	15	19	101,879	19	101,879	..	1	8	9	45,840
Central Coastal	29	..	7	36	150,923	38	157,425	3	..	5	8	57,721
East Central	124	1	9	134	223,102	134	223,102	2	..	6	8	50,608
South	9	..	2	11	25,157	12	25,782	..	..	1	1	1,250
Offshore	2	..	..	2	5,190	4	20,351	1	..	..	1	4,000
Colorado	15	2	36	53	271,582	53	271,582	..	..	25	25	123,527
Florida	1	..	5	6	67,520	6	67,520	1	..	5	6	67,520
Illinois	34	..	42	76	184,406	78	184,964	3	..	18	21	55,198
Indiana	14	4	26	44	64,158	45	65,774	3	2	14	19	24,326
Kansas	104	53	131	288	803,977	292	810,435	11	3	78	92	304,174
Kentucky	19	11	29	59	87,696	60	88,608	3	2	10	15	24,180
Louisiana	64	44	108	216	1,558,482	219	1,582,976	5	4	62	71	694,602
North	32	30	34	96	400,766	96	400,766	1	3	17	21	142,121
South	15	6	53	74	706,320	75	716,720	4	1	29	34	399,314
Offshore	17	8	21	46	451,395	48	465,490	..	..	16	16	153,167
Michigan	12	5	32	49	251,029	53	261,708	4	5	21	30	150,280
Mississippi	1	1	31	33	236,363	33	236,363	..	1	26	27	207,142
Missouri	..	..	2	2	4,555	2	4,555	..	..	2	2	4,555
Montana	4	4	44	52	162,226	52	162,226	2	..	30	32	115,286
Nebraska	3	..	14	17	87,507	17	87,507	..	..	10	10	50,478
New Mexico	33	50	29	112	647,131	112	647,131	..	3	12	15	111,605
East	28	24	21	73	495,831	73	495,831	..	3	10	13	101,684
West	5	26	8	39	151,300	39	151,300	..	..	2	2	9,921
New York	13	..	..	13	15,304	17	19,325	..	..	..	..	..
North Dakota	3	..	8	11	85,388	11	85,388	3	..	5	8	64,710
Ohio	40	61	11	112	514,445	112	514,445	5	13	1	19	94,540
Oklahoma	108	86	120	314	1,732,553	323	1,763,243	7	5	28	40	289,048
Pennsylvania	102	57	8	167	335,129	191	370,719	2	6	6	14	52,225
South Dakota	1	..	3	4	22,166	4	22,166	..	..	3	3	13,080
Tennessee	7	..	7	14	19,696	14	19,696	4	..	7	11	15,527
Texas	375	144	301	820	3,996,237	833	4,047,568	24	39	203	266	1,561,457
Dist. 1	19	1	7	27	66,128	27	66,128	1	1	6	8	25,320
Dist. 2	1	19	23	43	271,123	43	271,123	..	9	19	28	179,950
Dist. 3	34	12	30	76	470,960	76	470,960	1	8	20	29	265,296
Dist. 4	13	29	16	58	371,276	58	371,276	..	9	9	18	119,306
Dist. 5	2	1	13	16	77,639	16	77,639	..	..	8	8	45,699
Dist. 6	3	5	17	25	195,165	25	195,165	..	1	11	12	93,305
Dist. 7B	66	16	61	143	451,240	149	469,020	8	2	50	60	224,462
Dist. 7C	37	24	25	86	401,417	88	405,817	3	1	14	18	51,933
Dist. 8	86	11	14	111	564,444	112	570,708	3	5	10	18	138,174
Dist. 8A	34	7	22	63	337,769	67	360,656	..	..	11	11	73,900
Dist. 9	53	3	44	100	290,066	100	290,066	7	2	24	33	133,669
Dist. 10	27	16	22	65	440,433	65	440,433	1	1	14	16	151,866
Offshore	..	..	7	7	58,577	7	58,577	..	..	7	7	58,577
Utah	10	..	2	12	75,444	12	75,444	..	..	1	1	5,015
Virginia	..	3	..	3	15,411	3	15,411	..	..	..	..	..
West Virginia	41	59	18	118	307,269	118	307,269	2	3	4	9	26,401
Wyoming	20	5	30	55	398,137	55	398,137	1	2	23	26	193,575
Total—Sept. 1974	1,200	600	1,091	2,891	12,676,090	2,961	12,864,725	86	90	624	800	4,490,377
Total Aug. 1974	1,210	555	968	2,733	12,409,855	2,814	12,619,981	62	66	536	694	3,942,903
Cum. 1974	9,160	5,232	8,362	22,754	110,068,952	23,481	111,822,062	597	839	4,811	6,247	36,881,904
Cum. 1973	7,193	4,375	7,311	18,879	94,668,545	19,604	96,459,242	457	555	4,185	5,207	..

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Aug. 24, 1974, through Sept. 27, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests and outpost (extension) tests. ||Includes two strat tests and 68 service wells, 4,400 and 184,235 ft. **Excludes service wells, strat, and core tests.

Worldwide crude production

(Daily average in thousands of bbl)

	Aug. 1974	July* 1974	Daily prod. 1973	8-month average Daily prod. 1974	Change from Vol	%
WESTERN HEMISPHERE						
Argentina	405.0	405.0	419.0	411.0	- 8.0	- 1.9
Bolivia	50.0	50.0	48.0	48.0		
Brazil	170.0	170.0	169.0	171.0	2.0	1.2
Canada	1,644.0	1,676.0	1,793.0	1,748.0	- 45.0	- 2.5
Chile	30.0	30.0	32.0	30.0	- 2.0	- 6.3
Colombia	170.0	170.0	199.0	173.0	- 26.0	-13.1
Ecuador	110.0	85.0	202.0	190.0	- 12.0	- 5.9
Mexico	160.0	600.0	459.0	572.0	113.0	24.6
Peru	75.0	75.0	68.0	76.0	8.0	11.8
Trinidad	170.0	170.0	164.0	172.0	8.0	4.9
United States	8,926.0	8,955.0	9,227.0	8,957.0	-268.0	- 2.9
Venezuela	2,850.0	2,940.0	3,362.0	3,056.0	-306.0	- 9.1
Total	15,200.0	15,326.0	16,142.0	15,606.0	-536.0	- 3.3
WESTERN EUROPE						
Austria	45.0	45.0	49.0	47.0	- 2.0	- 4.1
Denmark	4.0	4.0	4.0	4.0		
France	25.0	25.0	26.0	24.0	- 2.0	- 7.7
West Germany	120.0	120.0	131.0	123.0	- 8.0	- 6.1
Italy	20.0	20.0	15.0	20.0	5.0	33.3
Netherlands	25.0	30.0	30.0	29.0	- 1.0	- 3.3
Norway	47.0	47.0	35.0	27.0	- 8.0	-22.9
Spain	41.0	40.0	13.0	41.0	28.0	215.4
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	65.0	65.0	67.0	67.0		
Total	394.0	398.0	372.0	384.0	12.0	3.2
MIDDLE EAST						
Abu Dhabi	1,479.0	1,641.0	1,338.0	1,493.0	155.0	11.6
Bahrain	66.0	67.0	68.0	67.0	- 1.0	- 1.5
Dubai	245.0	245.0	233.0	240.0	7.0	3.0
Iran	5,956.0	6,064.0	5,810.0	6,103.0	293.0	5.0
Iraq	1,440.0	1,635.0	1,919.0	1,755.0	-164.0	- 8.5
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,076.0	2,286.0	3,072.0	2,678.0	-394.0	-12.8
Oman	289.0	288.0	288.0	295.0	7.0	2.4
Qatar	516.0	520.0	588.0	518.0	- 70.0	-11.9
Saudi Arabia	8,284.0	8,778.0	7,755.0	8,387.0	632.0	8.1
Sharjah	50.0	50.0	0	8.5	8.5	
Syria	150.0	150.0	150.0	150.0		
Turkey	65.0	65.0	65.0	66.0	1.0	1.5
Total	20,716.0	21,889.0	21,386.0	21,860.5	474.5	2.2
ASIA-PACIFIC						
Afghanistan	0	0	0	0	0	0
Australia	290.0	313.0	367.0	350.0	- 17.0	- 4.6
Burma	20.0	20.0	20.0	20.0		
Brunei-Malaysia	375.0	375.0	313.0	366.0	53.0	16.9
India	150.0	150.0	148.0	149.0	1.0	0.7
Indonesia	1,417.0	1,450.0	1,284.0	1,465.0	171.0	13.2
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.0	8.0	8.0	8.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,277.2	2,333.2	2,167.2	2,375.2	208.0	9.6
AFRICA						
Algeria	850.0	900.0	1,122.0	1,019.0	-103.0	- 9.2
Angola	20.0	20.0	14.0	20.0	6.0	42.9
Cabinda	145.0	145.0	135.0	147.0	12.0	8.9
Congo	37.0	37.0	38.0	36.0	- 2.0	- 5.3
Egypt	155.0	160.0	206.0	113.0	- 93.0	-45.1
Gabon	155.0	160.0	140.0	161.0	21.0	15.0
Libya	1,394.0	1,583.0	2,256.0	1,785.0	-471.0	-20.9
Morocco	2.0	2.0	2.0	2.0		
Nigeria	2,100.0	2,196.0	1,977.0	2,240.0	263.0	13.3
Tunisia	65.0	65.0	83.0	66.0	- 17.0	-20.5
Total	4,922.0	5,268.0	5,973.0	5,589.0	-384.0	6.4
COMMUNIST						
China	900.0	900.0	860.0	900.0	40.0	4.7
Romania	290.0	290.0	283.0	290.0	7.0	2.5
U.S.S.R.†	9,042.0	9,207.0	8,450.0	9,042.0	592.0	7.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,342.0	10,507.0	9,693.0	10,342.0	649.0	6.7
WORLD TOTAL	53,851.2	55,721.0	55,733.2	56,156.7	423.5	1.0

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

Worldwide gas production

	Aug. 1974	July 1974	1974 cum.
(billion cu ft)			
Argentina	24.0	24.0	171.7
Bolivia	11.6	11.9	100.5
Brazil	4.0	4.7	31.2
Canada	268.3	260.2	2,145.7
Chile	11.9	19.1	131.9
Colombia	4.6	10.8	66.4
Ecuador	0.8	0.7	3.6
Mexico	59.0	55.0	447.9
Peru	6.4	6.1	47.8
Trinidad	4.7	5.2	42.8
United States	1,824.7	1,822.7	14,656.6
Venezuela	41.0	41.0	784.1
Total	2,261.0	2,261.4	18,630.2
WESTERN EUROPE			
Austria	5.3	5.4	66.9
Denmark	0	0	0
France	28.3	24.2	193.9
West Germany	59.7	58.9	463.8
Italy	58.2	55.1	411.2
Netherlands	135.3	203.2	1,927.9
Norway	0	0	0
Spain	0	0	0
United Kingdom	137.9	93.0	914.7
Yugoslavia	4.2	4.7	36.2
Total	428.9	444.5	4,014.6
MIDDLE EAST			
Abu Dhabi	0	0	0
Bahrain	0.3	0.5	2.8
Dubai	0	0	0
Iran	151.3	159.2	1,183.1
Iraq	10.0	10.1	86.4
Israel	0.2	0.1	3.5
Kuwait	0.2	0.1	1.1
Oman	0	0	0
Qatar	0.1	0.1	1.3
Saudi Arabia	0	0	0
Sharjah	0	0	0
Syria	0	0	0
Turkey	0	0	0
Total	162.1	170.1	1,278.2
ASIA-PACIFIC			
Afghanistan	7.8	7.8	61.8
Australia	15.9	15.0	102.1
Burma	0.5	0.5	3.9
Brunei-Malaysia	0.3	0.3	1.0
India	0.2	0.3	13.6
Indonesia	1.7	1.8	100.1
Japan	8.5	16.1	66.1
Pakistan	11.1	9.1	90.6
Taiwan	4.1	4.0	29.5
Thailand	0	0	0
Total	50.1	65.4	468.7
AFRICA			
Algeria	0.9	1.7	13.8
Angola	2.8	3.0	20.8
Cabinda	0	0	0
Congo	0.6	0.4	3.6
Egypt	5.7	5.1	30.2
Gabon	1.3	1.2	9.4
Libya	4.3	4.2	27.0
Morocco	6.6	1.8	20.3
Nigeria	4.6	5.2	38.4
Tunisia	0.2	0.4	4.8
Total	27.0	23.0	168.3
COMMUNIST			
China	16.8	17.1	125.5
Romania	77.1	78.2	602.4
U.S.S.R.†	758.9	724.6	5,965.7
Other	26.9	38.0	333.6
Total	879.7	857.9	7,027.2
WORLD TOTAL	3,808.8	3,822.3	31,587.2

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax	Pump price	Pump price
	10-22-74	10-22-74	10-23-73
Albany	42.9	54.9	41.6
Albuquerque	43.9	54.9	37.9
Amarillo	40.1	49.1	33.9
—Atlanta	42.1	53.6	39.0
—Baltimore	39.6	52.6	40.6
Birmingham	39.9	51.9	39.6
—Boston*	42.1	53.6	39.9
Buffalo	42.9	54.9	41.6
Charlotte	39.9	52.9	40.6
Cheyenne	44.9	55.9	41.6
—Chicago*	41.6	54.6	42.1
Cleveland	40.9	51.9	39.6
Corpus Christi	40.6	49.6	33.9
Dallas	40.6	49.6	33.9
Denver	44.9	55.9	40.6
Des Moines	41.0	52.0	37.9
Detroit	39.5	52.5	41.6
Fort Worth	40.6	49.6	33.9
Houston	40.6	49.6	33.9
Indianapolis	41.9	53.9	41.6
Jacksonville	39.9	51.9	39.6
Kansas City	43.9	54.9	39.6
Little Rock	39.5	51.0	36.9
Louisville	42.9	53.9	41.6
Los Angeles	39.8	50.8	38.9
Memphis	41.0	52.0	37.9
—Miami	41.6	53.6	39.0
Milwaukee	41.9	52.9	40.6
Minn.-St. Paul	42.0	53.0	38.9
—Newark	43.6	54.6	40.9
New Orleans	38.9	50.9	38.6
New York*	44.6	57.6	44.6
—Norfolk	39.6	52.6	38.9
Okla. City	43.3	53.9	36.9
Omaha	41.4	53.9	41.6
Philadelphia	39.9	52.9	39.6
Phoenix	42.8	53.8	39.9
Pittsburgh	39.9	52.9	39.6
Portland, Ore.	41.8	52.8	39.9
Salt Lake City	42.9	53.9	38.6
San Antonio	40.1	49.1	33.9
San Diego	40.4	51.4	38.9
San Francisco	41.0	52.0	39.9
Seattle	40.4	53.4	39.9
Spokane	40.4	53.4	40.9
Springfield, Ill.*	42.0	55.0	40.9
St. Louis	42.0	53.0	40.6
—Tampa	41.6	53.6	39.0
Texarkana	40.1	49.1	33.9
Tulsa	40.4	51.0	36.9
Wichita	40.9	51.9	39.6
Wichita Falls	40.1	49.1	33.9
Week's avg.	41.37	52.68	38.90
Sept. avg.	43.32	54.63	37.84
Aug. avg.	43.36	54.67	37.99
1974 to date	40.20	51.48	
1973 to date	26.96	38.46	

+ Increase, — decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday each week. They may differ from refiners' prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	26.75-30.00
Premium (99 octane)	28.75-32.00

California (rack) Los Angeles:

—Regular (91 octane)	25.00-31.50
—Regular (95 octane)	26.10-32.50
—Premium (100 octane)	27.40-33.50

Chicago:

Regular (94 octane)	28.00-33.00
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

+Distillate No. 1	27.50-33.50
+Distillate No. 2	26.50-32.00

Gulf Coast (cargoes):

Kerosine (42-43)	27.50-29.00
Distillate No. 2	26.50-28.00

Mid-Continent (Group 3):

Kerosine (42-44)	27.25-29.25
Diesel oil (58 d.i. & above)	27.00-30.00
Distillate No. 1	26.50-29.50
Distillate No. 2	25.50-27.50

New York Harbor (barges):

Kerosine (42-44)	28.05-33.75
Distillate No. 2	27.50-29.25
Diesel fuel (48-52 di.)	27.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

No. 6 (max. 1% S)	\$13.86
No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

No. 6 (max. 0.3% S)	\$13.03-14.13
+No. 5 (0.3% S)	\$13.41-14.38

API reports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	10-18 1974	10-11 1974	10-19 1973	10-18 1974	10-11 1974	10-19 1973	10-18 1974	10-11 1974	10-19 1973
Gasoline	259	225	153	10	10		269	235	153
Special Naphthas									
Kerosine	5	5					5	5	
Distillate	218	282	341	10	10	21	228	292	362
No. 4 Fuel Oil	40	53	63				40	53	63
Residual	1,663	1,511	1,687	50	50	41	1,713	1,561	1,728
Jet Fuel (Naphtha)			1	2	2	5	2	2	6
Jet Fuel (Kerosine)	98	160	125	58	56	56	156	216	181
Asphalt	21	19	40				21	19	40
LP-Gas	111	106	69	18	14	12	129	120	81
Petrochem Feedstocks	32	20	1				32	20	1
Unfinished	115	84	71	10	10	39	125	94	110
Plant Condensate	89	72	75	5	5	8	94	77	83
Total Prod.	2,651	2,537	2,626	163	157	182	2,814	2,694	2,808
Canadian Crude	541	450	698	242	101	55	783	551	763
Other Foreign	2,275	2,546	2,178	567	568	981	2,842	3,114	3,149
Total Crude	2,816	2,996	2,876	809	669	1,036	3,625	3,665	3,912
Total Imports	5,467	5,533	5,502	972	826	1,218	6,439	6,359	6,720

Worldwide crude production

(Daily average in thousands of bbl)

	July 1974	June* 1974	Daily prod. 1973	7-month average Daily prod. 1974	Change from Vol. %	
WESTERN HEMISPHERE						
Argentina	405.0	406.0	419.0	412.0	- 7.0	- 1.7
Bolivia	50.0	50.0	48.0	49.0	1.0	2.1
Brazil	170.0	170.0	169.0	171.0	2.0	1.2
Canada	1,676.0	1,682.0	1,789.0	1,770.0	- 19.0	- 1.1
Chile	30.0	30.0	32.0	30.0	- 2.0	- 6.3
Colombia	175.0	175.0	199.0	175.0	- 24.0	-12.1
Ecuador	200.0	230.0	201.0	228.0	27.0	13.4
Mexico	600.0	575.0	457.0	568.0	111.0	24.3
Peru	75.0	75.0	67.0	76.0	9.0	13.4
Trinidad	170.0	170.0	164.0	172.0	8.0	4.9
United States	8,955.0	8,940.0	9,236.0	8,969.0	-267.0	- 2.9
Venezuela	2,940.0	2,944.0	3,360.0	3,086.0	-274.0	- 8.2
Total	15,446.0	15,447.0	16,141.0	15,706.0	-435.0	- 2.7
WESTERN EUROPE						
Austria	45.0	45.0	49.0	47.0	- 2.0	- 4.1
Denmark	4.0	4.0	4.0	4.0		
France	25.0	25.0	27.0	24.0	- 3.0	-11.1
West Germany	123.0	122.0	131.0	124.0	- 7.0	- 5.3
Italy	20.0	20.0	15.0	20.0	5.0	33.3
Netherlands	30.0	30.0	29.0	30.0	1.0	3.4
Norway	47.0	38.0	36.0	24.0	- 12.0	-33.3
Spain	44.0	44.0	12.0	42.0	30.0	250.0
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	65.0	65.0	67.0	68.0	1.0	1.5
Total	405.0	395.0	372.0	385.0	13.0	3.5
MIDDLE EAST						
Abu Dhabi	1,641.0	1,581.0	1,339.0	1,495.0	156.0	11.7
Bahrain	67.0	67.0	68.0	68.0		
Dubai	295.0	243.0	225.0	241.0	16.0	7.1
Iran	6,064.0	6,063.0	5,826.0	6,125.0	299.0	5.1
Iraq	1,635.0	1,584.0	1,903.0	1,784.0	-119.0	- 6.3
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,286.0	2,869.0	3,075.0	2,764.0	-311.0	-10.1
Oman	288.0	296.0	287.0	296.0	9.0	3.1
Qatar	518.0	520.0	591.0	518.0	- 73.0	-12.4
Saudi Arabia	8,778.0	8,870.0	7,650.0	8,401.0	751.0	9.8
Sharjah†	50.0					
Syria	150.0	150.0	150.0	150.0		
Turkey	65.0	65.0	64.0	66.0	2.0	3.1
Total	21,937.0	22,408.0	21,278.0	22,008.0	730.0	3.4
ASIA-PACIFIC						
Afghanistan						
Australia	313.0	325.0	364.0	358.0	- 6.0	- 1.6
Burma	20.0	20.0	20.0	20.0		
Brunei-Malaysia	375.0	375.0	311.0	364.0	53.0	17.0
India	150.0	150.0	148.0	149.0	1.0	0.7
Indonesia	1,469.0	1,488.0	1,285.0	1,478.0	193.0	15.0
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.5	8.5	8.5	8.5		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,352.7	2,383.7	2,153.7	2,394.7	241.0	11.2
AFRICA						
Algeria	900.0	950.0	1,110.0	1,044.0	- 66.0	- 5.9
Angola	20.0	20.0	14.0	20.0	6.0	42.9
Cabinda	145.0	145.0	133.0	148.0	15.0	11.3
Congo	37.0	37.0	37.0	36.0	- 1.0	- 2.7
Egypt	160.0	160.0	205.0	107.0	- 98.0	-47.8
Gabon	160.0	160.0	138.0	162.0	24.0	17.4
Libya	1,583.0	1,775.0	2,277.0	1,842.0	-435.0	-19.1
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,196.0	2,336.0	1,958.0	2,283.0	325.0	16.6
Tunisia	65.0	65.0	84.0	66.0	- 18.0	-21.4
Total	5,267.0	5,649.0	5,957.0	5,709.0	-248.0	- 4.2
COMMUNIST						
China	900.0	900.0	860.0	900.0	40.0	4.7
Rumania	290.0	290.0	283.0	290.0	7.0	2.5
U.S.S.R.†	9,207.0	9,198.0	8,385.0	9,056.0	671.0	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,507.0	10,498.0	9,628.0	10,356.0	728.0	7.6
WORLD TOTAL	55,914.7	56,760.7	55,529.7	56,558.7	1,029.0	1.9

*Figures adjusted. †On stream July 1974. ‡Includes gas liquids.

Worldwide gas production

(billion cu ft)

	July* 1974	June 1974	1977 cum.
WESTERN HEMISPHERE			
Argentina	24.0	21.5	147.7
Bolivia	11.9	12.0	88.9
Brazil	4.7	3.9	27.2
Canada	260.2	259.7	1,877.4
Chile	19.1	20.1	120.0
Colombia	10.8	11.9	61.8
Ecuador	0.7	0.5	2.8
Mexico	55.0	53.9	388.9
Peru	6.1	4.9	41.4
Trinidad	5.2	4.8	38.1
United States	1,897.7	1,710.2	12,987.1
Venezuela	41.0	35.0	743.1
Total	2,336.4	2,138.4	16,524.4
WESTERN EUROPE			
Austria	5.4	8.9	61.6
Denmark	24.2	22.1	165.6
France	58.9	49.9	404.1
West Germany	55.1	49.9	353.0
Italy	203.2	264.6	1,792.6
Netherlands	93.0	98.5	776.8
Norway	4.7	4.7	32.0
Spain	44.5	49.5	3,585.7
United Kingdom	4.7	4.7	32.0
Yugoslavia	4.7	4.7	32.0
Total	444.5	498.5	3,585.7
MIDDLE EAST			
Abu Dhabi	0.5	0.4	2.5
Bahrain	159.2	149.6	1,031.8
Dubai	10.1	11.1	76.4
Iran	0.1	0.2	3.3
Iraq	0.1	0.1	0.9
Israel	0.1	0.2	1.2
Kuwait	0.1	0.2	1.2
Oman	0.1	0.2	1.2
Qatar	0.1	0.2	1.2
Saudi Arabia	0.1	0.2	1.2
Sharjah†	0.1	0.2	1.2
Syria	0.1	0.2	1.2
Turkey	0.1	0.2	1.2
Total	170.1	161.6	1,116.1
ASIA-PACIFIC			
Afghanistan	7.8	7.9	54.0
Australia	15.0	14.8	86.2
Burma	0.5	0.4	3.4
Brunei-Malaysia	0.3	0.2	0.7
India	1.8	2.1	13.4
Indonesia	16.1	14.0	98.4
Japan	9.1	8.6	57.6
Pakistan	10.8	11.1	79.5
Taiwan	4.0	3.2	25.4
Thailand	4.0	3.2	25.4
Total	65.4	62.3	418.6
AFRICA			
Algeria	1.7	1.9	12.9
Angola	3.0	2.3	18.0
Cabinda	0.4	0.6	3.0
Congo	5.1	4.5	24.5
Egypt	1.2	1.3	8.1
Gabon	4.2	4.9	22.7
Libya	1.8	2.0	13.7
Morocco	5.2	4.7	33.8
Nigeria	0.4	0.5	4.6
Tunisia	0.4	0.5	4.6
Total	23.0	23.2	141.3
COMMUNIST			
China	17.1	16.0	108.7
Rumania	78.2	77.1	525.3
U.S.S.R.†	724.6	723.7	5,207.7
Other	38.0	31.9	306.7
Total	857.9	848.7	6,148.4
WORLD TOTAL	3,897.3	3,732.8	27,934.5

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax 9-17-74	Pump price 9-17-74	Pump price 9-18-73
Albany	45.9	57.9	39.9
Albuquerque	46.9	57.9	37.9
Amarillo	41.1	50.1	33.9
Atlanta	42.2	55.7	38.9
Baltimore	42.9	55.9	38.9
Birmingham	42.9	54.9	37.9
Boston*	44.2	55.7	38.9
Buffalo	45.9	57.9	39.9
Charlotte	42.9	55.9	38.9
Cheyenne	47.9	58.9	39.9
Chicago*	45.6	58.6	40.4
Cleveland	43.9	54.9	37.9
Corpus Christi	41.6	50.6	33.9
Dallas	41.6	50.6	33.9
Denver	47.9	58.9	38.9
+ Des Moines	41.0	52.0	37.9
Detroit	42.5	55.5	39.9
Fort Worth	41.6	50.6	33.9
Houston	41.6	50.6	33.9
Indianapolis	44.9	56.9	39.9
Jacksonville	42.9	54.9	37.9
Kansas City	46.9	57.9	37.9
+ Little Rock	39.5	51.0	36.9
Louisville	45.9	56.9	37.9
Los Angeles	41.1	52.1	37.9
+ Memphis	41.0	52.0	37.9
Miami	43.7	55.7	38.9
Milwaukee	44.9	55.9	38.9
+ Minn. St. Paul	42.0	53.0	38.9
Newark	45.7	56.7	39.9
New Orleans	41.9	53.9	36.9
New York*	46.9	59.9	41.9
Norfolk	41.7	54.7	37.9
Okla. City	46.3	56.9	36.9
Omaha	44.4	56.9	39.9
Philadelphia	42.9	55.9	37.9
Phoenix	43.7	54.7	38.9
Pittsburgh	42.9	55.9	37.9
Portland, Ore.	43.2	54.2	38.9
Salt Lake City	45.9	56.9	36.9
San Antonio	41.1	50.1	33.9
San Diego	41.7	52.7	38.9
San Francisco	42.3	53.3	38.9
Seattle	41.7	54.7	39.9
Spokane	41.7	54.7	39.9
+ Springfield, Ill.*	42.0	55.0	40.9
St. Louis	44.3	55.9	38.9
Tampa	43.7	55.7	38.9
Texarkana	41.1	50.1	33.9
+ Tulsa	40.4	51.0	36.9
Wichita	43.9	54.9	37.9
Wichita Falls	41.1	50.1	33.9
Week's avg.	43.38	54.70	37.99
Aug. avg.	43.36	54.67	37.99
July avg.	43.24	54.51	38.00
1974 to date	39.93	51.21	
1973 to date	26.95	38.52	

+ Increase, — decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday each week. They may differ from refiners' prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	28.00-32.00
Premium (99 octane)	30.00-34.00

California (rack) Los Angeles:

Regular (91 octane)	25.00-33.55
Regular (95 octane)	26.10-34.65
Premium (100 octane)	27.40-35.65

Chicago:

Regular (94 octane)	28.00-33.00
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

Distillate No. 1	27.50-34.00
Distillate No. 2	26.50-33.00

Gulf Coast (cargoes):

Kerosine (42-43)	27.50-29.00
Distillate No. 2	26.50-28.00

Mid-Continent (Group 3):

Kerosine (42-44)	24.50-28.75
Diesel oil (58 d.i. & above)	27.00-30.00
Distillate No. 1	24.50-29.50
Distillate No. 2	23.00-27.50

New York Harbor (barges):

Kerosine (42-44)	29.50-33.75
Distillate No. 2	26.25-29.20
Diesel fuel (48-52 d.i.)	26.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max 1% S)	\$10.30
No. 6 (over 1% S)	\$ 9.30

Chicago:

+ No. 6 (max. 1% S)	\$13.86
+ No. 5 (max. 1% S)	\$14.70

New York Harbor (barges):

No. 6 (max. 0.3% S)	\$13.39-14.13
No. 5 (0.3% S)	\$13.57-14.34

California (marine pipeline):

— Bunker C Los Angeles	\$4.76
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API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	5-13 1974	9-6 1974	9-14 1973	9-13 1974	9-6 1974	9-14 1973	9-13 1974	9-6 1974	9-14 1973
Gasoline	278	139	150	5	23		283	162	150
Special Naphthas	5	5					5	5	
Kerosine	4	3					4	3	
Distillate	143	76	160	5	12		148	88	160
No. 4 Fuel Oil	20	36	31				20	36	31
Residual	1,742	1,895	1,643	50	50	17	1,792	1,945	1,660
Jet Fuel (Naphtha)			5	5	5	5	5	5	10
Jet Fuel (Kerosine)	95	112	116	56	53	42	151	165	158
Asphalt	74	67	30				74	67	30
LP-Gas	106	105	85	13	16	12	119	121	97
Petrochem Feedstocks	31	14	39				31	14	39
Unfinished	91	110	113	33	25	10	124	135	123
Plant Condensate	112	68	109	5	5	8	117	73	117
Total Prod.	2,701	2,630	2,481	172	189	94	2,873	2,819	2,575
Canadian Crude	478	400	711	216	233	242	694	633	953
Other Foreign	2,077	2,573	2,062	626	659	600	2,703	3,232	2,662
Total Crude	2,555	2,973	2,773	842	892	842	3,397	3,865	3,615
Total Imports	5,256	5,603	5,254	1,014	1,081	936	6,270	6,684	6,190

Worldwide crude production (Daily average in thousands of bbl)

	June 1974	May* 1974	Daily prod. 1973	6-month average Daily prod. 1974	Change from Vol. %	
WESTERN HEMISPHERE						
Argentina	420.0	420.0	421.0	419.0	- 2.0	- 0.5
Bolivia	50.0	50.0	48.0	50.0	2.0	4.2
Brazil	170.0	170.0	169.0	170.0	1.0	0.6
Canada	1,836.0	1,732.0	1,786.0	1,840.0	54.0	3.0
Chile	30.0	30.0	33.0	30.0	- 3.0	- 9.1
Colombia	175.0	175.0	199.0	175.0	- 24.0	-12.1
Ecuador	230.0	227.0	199.0	233.0	34.0	17.1
Mexico	530.0	530.0	455.0	525.0	70.0	15.4
Peru	75.0	75.0	67.0	70.0	9.0	13.4
Trinidad	170.0	170.0	164.0	173.0	9.0	5.5
United States	8,940.0	8,939.0	9,243.0	8,973.0	-270.0	- 2.9
Venezuela	2,944.0	2,930.0	3,351.0	3,102.0	-249.0	- 7.4
Total	15,570.0	15,448.0	16,135.0	15,766.0	-369.0	- 2.3
WESTERN EUROPE						
Austria	50.0	50.0	50.0	50.0	.....	.....
Denmark	4.0	4.0	4.0	4.0	.....	.....
France	25.0	25.0	27.0	24.0	- 3.0	-11.1
West Germany	124.0	123.0	131.0	125.0	- 6.0	- 4.6
Italy	15.0	15.0	14.0	15.0	1.0	7.1
Netherlands	30.0	30.0	30.0	30.0	.....	.....
Norway	38.0	30.0	36.0	20.0	- 16.0	-44.4
Spain	44.0	44.0	11.0	37.0	26.0	236.4
United Kingdom	2.0	2.0	2.0	2.0	.....	.....
Yugoslavia	65.0	65.0	66.0	66.0	.....	.....
Total	397.0	388.0	371.0	373.0	2.0	0.5
MIDDLE EAST						
Abu Dhabi	1,581.0	1,632.0	1,338.0	1,470.0	132.0	9.9
Bahrain	67.0	66.0	68.0	68.0	.....	.....
Dubai	230.0	227.0	222.0	229.0	7.0	3.2
Iran	6,063.0	6,182.0	5,818.0	6,136.0	318.0	5.5
Iraq	1,584.0	1,592.0	1,871.0	1,810.0	- 61.0	- 3.3
Israel	100.0	100.0	100.0	100.0	.....	.....
Kuwait	2,869.0	2,845.0	3,031.0	2,846.0	-185.0	- 6.1
Oman	300.0	303.0	285.0	298.0	13.0	4.6
Qatar	518.0	519.0	589.0	518.0	- 71.0	-12.1
Saudi Arabia	8,870.0	9,017.0	7,464.0	8,336.0	872.0	11.7
Syria	150.0	150.0	121.0	142.0	21.0	17.4
Turkey	65.0	65.0	63.0	65.0	2.0	3.2
Total	22,397.0	22,698.0	20,970.0	22,018.0	1,048.0	5.0
ASIA-PACIFIC						
Australia	325.0	361.0	359.0	366.0	7.0	1.9
Burma	20.0	20.0	20.0	21.0	1.0	5.0
Brunei-Malaysia	375.0	375.0	309.0	363.0	54.0	17.5
India	150.0	150.0	148.0	150.0	2.0	1.4
Indonesia	1,522.0	1,530.0	1,271.0	1,485.0	214.0	16.8
Japan	15.0	15.0	15.0	15.0	.....	.....
Pakistan	8.0	8.0	8.0	8.0	.....	.....
Taiwan	2.0	2.0	2.0	2.0	.....	.....
Thailand	0.2	0.2	0.2	0.2	.....	.....
Total	2,417.2	2,461.2	2,132.2	2,410.2	278.0	13.0
AFRICA						
Algeria	950.0	1,000.0	1,110.0	1,039.0	- 71.0	- 6.4
Angola	20.0	20.0	13.0	20.0	7.0	53.8
Cabinda	145.0	145.0	132.0	149.0	16.0	12.1
Congo	37.0	37.0	38.0	36.0	- 2.0	- 5.3
Egypt	160.0	150.0	200.0	97.0	-103.0	-51.5
Gabon	160.0	160.0	135.0	162.0	27.0	20.0
Libya	1,775.0	1,950.0	2,292.0	1,887.0	-405.0	-17.7
Morocco	1.0	1.0	1.0	1.0	.....	.....
Nigeria	2,335.0	2,250.0	1,953.0	2,271.0	318.0	16.2
Tunisia	65.0	65.0	84.0	66.0	- 18.0	-21.4
Total	5,648.0	5,778.0	5,958.0	5,727.0	-231.0	3.9
COMMUNIST						
China	900.0	900.0	860.0	900.0	40.0	4.7
Rumania	280.0	280.0	275.0	280.0	5.0	1.8
U.S.S.R.	9,198.0	9,137.0	8,368.0	9,034.0	666.0	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,488.0	10,427.0	9,603.0	10,324.0	721.0	7.5
WORLD TOTAL	56,917.2	57,200.2	55,169.2	56,618.2	14,490.0	2.6

*Figures adjusted. †Includes gas liquids.

Worldwide gas production (Billion cu ft)

	June 1974	May 1974	1974 cum.
WESTERN HEMISPHERE			
Argentina	21.5	21.0	123.7
Bolivia	12.0	11.9	77.0
Brazil	3.9	3.6	22.5
Canada	259.7	261.1	1,617.2
Chile	20.1	23.2	100.9
Colombia	11.9	10.2	51.0
Ecuador	0.5	0.4	2.1
Mexico	53.9	55.8	333.9
Peru	4.9	3.8	35.3
Trinidad	4.8	2.4	32.9
United States	1,710.2	1,711.4	11,089.4
Venezuela	35.0	44.9	702.1
Total	2,138.4	2,149.7	14,188.0
WESTERN EUROPE			
Austria	8.9	9.4	56.2
Denmark	....	....	....
France	22.1	24.2	141.4
West Germany	49.9	65.8	345.2
Italy	49.9	50.0	297.9
Netherlands	264.6	305.5	1,589.4
Norway	....	....	....
Spain	98.5	117.4	683.8
United Kingdom	4.7	3.7	27.3
Total	498.6	576.0	3,141.2
MIDDLE EAST			
Abu Dhabi	....	....	....
Bahrain	0.4	0.5	2.0
Dubai	....	....	....
Iran	149.6	153.5	872.6
Iraq	11.1	11.1	66.3
Israel	0.2	0.1	3.2
Kuwait	0.1	0.2	0.8
Oman	....	....	....
Qatar	0.2	0.3	1.1
Saudi Arabia	....	....	....
Syria	....	....	....
Turkey	....	....	....
Total	161.6	154.6	946.0
ASIA-PACIFIC			
Australia	7.9	7.8	46.2
Burma	14.8	11.4	71.2
Brunei-Malaysia	0.4	0.6	2.9
India	0.2	0.2	0.4
Indonesia	2.1	1.6	11.6
Japan	14.0	15.5	82.3
Pakistan	8.6	6.2	48.5
Taiwan	11.1	14.0	68.7
Thailand	3.2	3.1	21.4
Total	62.3	60.4	353.2
AFRICA			
Algeria	1.9	1.7	11.2
Angola	2.8	2.9	15.0
Cabinda	....	....	....
Congo	0.6	0.4	2.6
Egypt	4.5	4.1	19.4
Gabon	1.3	1.2	6.9
Libya	4.9	4.7	18.5
Morocco	2.0	2.5	11.9
Nigeria	4.7	6.2	28.6
Tunisia	0.5	0.6	4.2
Total	23.2	24.3	118.3
COMMUNIST			
China	16.0	15.9	91.6
Rumania	77.1	68.2	447.1
U.S.S.R.	723.7	741.3	4,483.1
Other	31.9	31.9	268.7
Total	848.7	857.3	5,290.5
WORLD TOTAL	3,732.8	3,822.3	24,037.2

*Figures Adjusted.

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REACTORS

6-138" x 16'9", 770 PSIG, 650° F., internally insulated. Excellent condition. Available shipment Michigan location. More detailed info available.

HEAT EXCHANGERS

E-31 Heat Exchanger, 770 psig @ 650° F., 23,800 sq. ft. surface, 1 pass both sides, 2191-3/4" tubes x 0.075" M.W. thickness x 56 ft. long.

E-1 Heat Exchanger, 770 psig @ 650° F., 3000 sq. ft. surface, U Tube, 2 pass both sides, 680-3/4" tubes x 14 Ga. x 14' long.

E-3 Heat Exchanger, shell 770 psig @ 750° F., 2 pass, Tubes 770 psig @ 650° F., 2 pass, 1240 low fin 3/4" tubes x 14 ga. x 16' long, 19,500 sq. ft. extended surface or equivalent to 9,000 sq. ft. of smooth tube. More detailed info. available. Delivery Michigan location.

AIR COOLERS

E-2 Air Cooler, 770 PSIG design, 6 sections, 3 pass, 3 fans 30 HP each, 3 bays, 5700 sq. ft. bare surface, 110,166 sq. ft. extended surface.

E-4 Air Cooler, 770 PSIG design, 2 sections, 2 pass, 1 fan 40 HP, 1 bay, 2098 sq. ft. bare surface, 40,536 sq. ft. extended surface.

E-8 Air Cooler consisting of: depropanizer reflux condenser, debutanizer reflux condenser and propane product cooler, one structure, 2 fans 2 speed 20 HP each. More info. available. All excellent condition. Available shipment Michigan location.

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Mid-States Equipment Company

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Tulsa, Oklahoma 74101

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63,218'	6 5/8" O.D.	.203 wall, Grade B	\$452.00/cft
46,775'	8 5/8" O.D.	.156 wall, Grade B	\$459.00/cft
104,141'	8 5/8" O.D.	.188 wall, Grade B	\$550.00/cft
36,143'	8 5/8" O.D.	.203 wall, Grade B	\$593.00/cft
3,000'	24" O.D.	.250 wall, 63.41#/ft	\$2,335.00/cft
3,000'	24" O.D.	.312 wall, 79.06#/ft	\$2,911.00/cft
4,000'	24" O.D.	.375 wall, 94.62#/ft	\$3,465.00/cft
1,500'	24" O.D.	.500 wall, 125.49#/ft	\$4,595.00/cft
1,000'	30" O.D.	.312 wall, 98.93#/ft	\$3,700.00/cft
2,000'	30" O.D.	.375 wall, 118.65#/ft	\$4,420.00/cft
750'	30" O.D.	.500 wall, 157.53#/ft	\$5,868.00/cft
1,000'	36" O.D.	.312 wall, 118.92#/ft	\$4,551.00/cft
2,000'	36" O.D.	.375 wall, 142.68#/ft	\$5,440.00/cft
520'	36" O.D.	.500 wall, 189.57#/ft	\$7,228.00/cft

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40 ton minimum lots. • Subject to prior sale.
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Ask for Byron Glass or Earle Cohen.
Complete stocks — pipe, valves and fittings.

Worldwide crude production (Daily average in thousands of bbl)

	May 1974	April* 1974	Daily prod. 1973	5-month average Daily prod. 1974	Change from Vol.	%
WESTERN HEMISPHERE						
Argentina	420.0	420.0	423.0	420.0	- 3.0	- 0.7
Bolivia	57.0	50.0	49.0	50.0	1.0	2.0
Brazil	171.0	170.0	169.0	170.0	1.0	0.6
Canada	1,732.0	1,810.0	1,802.0	1,822.0	20.0	1.1
Chile	30.0	30.0	33.0	30.0	- 3.0	- 9.1
Colombia	175.0	175.0	199.0	176.0	- 23.0	- 11.6
Ecuador	227.0	245.0	200.0	233.0	33.0	16.5
Mexico	530.0	530.0	454.0	524.0	70.0	15.4
Peru	75.0	75.0	67.0	75.0	8.0	11.9
Trinidad	170.0	170.0	164.0	172.0	8.0	4.9
United States	8,939.0	8,965.0	9,250.0	8,995.0	-255.0	- 2.8
Venezuela	2,930.0	3,044.0	3,337.0	3,133.0	-204.0	- 6.1
Total	15,448.0	15,684.0	16,147.0	15,800.0	-247.0	- 2.5
WESTERN EUROPE						
Austria	50.0	50.0	50.0	50.0		
Denmark	0.0	2.0	4.0	4.0		
France	25.0	25.0	27.0	24.0	- 3.0	- 11.1
West Germany	123.0	123.0	131.0	125.0	- 6.0	- 4.6
Italy	15.0	15.0	15.0	15.0		
Netherlands	30.0	30.0	30.0	30.0		
Norway	27.0	13.0	35.0	17.0	- 18.0	- 51.4
Spain	40.0	40.0	9.0	37.0	28.0	311.1
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	65.0	65.0	66.0	66.0		
Total	377.0	365.0	369.0	370.0	1.0	0.3
MIDDLE EAST						
Abu Dhabi	1,632.0	1,616.0	1,344.0	1,448.0	104.0	7.7
Bahrain	66.0	67.0	68.0	68.0		
Dubai	227.0	241.0	224.0	229.0	5.0	2.2
Iran	6,182.0	6,175.0	5,822.0	6,150.0	328.0	5.6
Iraq	1,592.0	1,882.0	1,853.0	1,855.0	2.0	0.1
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,845.0	2,836.0	3,072.0	2,842.0	-230.0	- 7.5
Oman	303.0	296.0	284.0	297.0	13.5	4.6
Qatar	519.0	519.0	595.0	518.0	- 77.0	- 12.9
Saudi Arabia	9,017.0	8,653.0	7,453.0	8,230.0	777.0	10.4
Syria	150.0	150.0	120.0	141.0	21.0	17.5
Turkey	65.0	65.0	62.0	65.0	3.0	4.8
Total	22,698.0	22,600.0	20,997.0	21,943.0	946.0	4.5
ASIA-PACIFIC						
Afghanistan						
Australia	361.0	351.0	354.0	374.0	20.0	5.6
Burma	20.0	20.0	20.0	21.0	1.0	5.0
Brunei-Malaysia	375.0	375.0	307.0	360.0	53.0	17.3
India	150.0	150.0	148.0	150.0	2.0	1.4
Indonesia	1,530.0	1,500.0	1,254.0	1,477.0	223.0	17.8
Japan	15.0	15.0	15.0	15.0		
Pakistan	9.0	9.0	9.0	9.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,462.2	2,422.2	2,109.2	2,408.2	299.0	14.2
AFRICA						
Algeria	1,000.0	1,000.0	1,109.0	1,056.0	- 53.0	- 4.8
Angola	20.0	20.0	13.0	20.0	7.0	53.8
Cabinda	145.0	150.0	132.0	149.0	17.0	12.9
Congo	37.0	34.0	36.0	35.0	- 1.0	- 2.8
Egypt	130.0	100.0	205.0	81.0	-124.0	- 60.5
Gabon	160.0	176.0	133.0	162.0	29.0	21.8
Libya	1,950.0	1,734.0	2,293.0	1,909.0	-384.0	- 16.7
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,250.0	2,275.0	1,943.0	2,251.0	308.0	15.9
Tunisia	65.0	65.0	84.0	67.0	- 17.0	- 20.2
Total	5,758.0	5,555.0	5,949.0	5,731.0	-218.0	- 3.6
COMMUNIST						
China	860.0	860.0	650.0	860.0	210.0	32.3
Rumania	280.0	280.0	275.0	280.0	5.0	1.8
U.S.S.R.†	9,137.0	9,028.0	8,327.0	8,992.0	665.0	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,387.0	10,198.0	9,352.0	10,242.0	890.0	9.5
WORLD TOTAL	57,130.2	56,824.2	54,923.2	56,494.2	1,571.0	2.9

*Figures adjusted. †Includes gas liquids.

Worldwide gas production (Billion cu ft)

	May	April	1974 cum.
WESTERN HEMISPHERE			
Argentina	21.0	21.0	102.2
Bolivia	11.9	14.1	65.0
Brazil	3.6	4.6	18.6
Canada	261.1	271.2	1,357.5
Chile	23.2	11.9	80.8
Colombia	10.2	5.0	39.1
Ecuador	0.4	0.3	1.6
Mexico	55.8	56.3	280.0
Peru	3.8	3.5	30.4
Trinidad	2.4	4.9	28.1
United States	1,711.4	1,770.2	9,379.2
Venezuela	44.9	140.1	667.1
Total	2,149.7	2,303.1	12,049.6
WESTERN EUROPE			
Austria	9.4	10.1	47.3
Denmark			
France	24.2	24.1	119.3
West Germany	65.8	60.2	295.3
Italy	50.0	49.3	248.0
Netherlands	305.5	271.2	1,324.8
Norway			
Spain	117.4	141.2	585.3
United Kingdom	3.7	5.0	22.6
Yugoslavia			
Total	576.0	561.1	2,642.6
MIDDLE EAST			
Abu Dhabi			
Bahrain	0.5	0.1	1.6
Dubai			
Iran	153.5	140.8	723.0
Iraq	11.1	11.0	55.2
Israel	0.1	1.0	3.0
Kuwait	0.2	0.1	0.7
Oman			
Qatar	0.3	0.2	0.9
Saudi Arabia			
Syria			
Turkey			
Total	154.6	153.2	784.4
ASIA-PACIFIC			
Afghanistan	7.8	8.1	38.3
Australia	11.4	10.2	56.4
Burma	0.6	0.4	2.5
Brunei-Malaysia	0.2		0.2
India	1.6	1.8	9.5
Indonesia	15.5	12.0	68.3
Japan	6.2	9.0	39.9
Pakistan	14.0	10.1	57.6
Taiwan	3.1	3.8	18.2
Thailand			
Total	60.4	55.4	290.9
AFRICA			
Algeria	1.7	2.0	9.3
Angola	2.9	3.0	12.2
Cabinda			
Congo	0.4	0.2	2.0
Egypt	4.1	3.0	14.9
Gabon	1.2	1.0	5.6
Libya	4.7	2.1	13.6
Morocco	2.5	1.5	9.9
Nigeria	6.2	5.0	23.9
Tunisia	0.6	0.2	3.7
Total	24.3	18.0	95.1
COMMUNIST			
China	15.9	16.0	75.6
Rumania	68.2	70.1	373.0
U.S.S.R.†	741.3	737.7	3,741.8
Other	31.9	35.0	236.8
Total	857.3	858.8	4,424.2
WORLD TOTAL	3,822.3	3,949.6	20,286.6

Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax 7-16-74	Pump price 7-16-74	Pump price 7-17-73
Albany	45.9	57.9	39.9
Albuquerque	46.9	57.9	37.9
+ Amarillo	40.1	49.1	33.9
Atlanta	44.2	55.7	38.9
Baltimore	42.9	55.9	38.9
Birmingham	42.9	54.9	37.9
Boston*	44.2	55.7	38.9
Buffalo	45.9	57.9	39.9
Charlotte	42.9	55.9	38.9
Cheyenne	47.9	58.9	39.9
Chicago*	45.6	58.6	40.4
Cleveland	43.9	54.9	37.9
+ Corpus Christi	40.6	49.6	33.9
+ Dallas	40.6	49.6	33.9
Denver	47.9	58.9	38.9
Des Moines	42.9	53.9	37.9
Detroit	42.5	55.5	39.9
+ Fort Worth	40.6	49.6	33.9
+ Houston	40.6	49.6	33.9
Indianapolis	44.9	56.9	39.9
Jacksonville	42.9	54.9	37.9
Kansas City	46.9	57.9	37.9
Little Rock	41.4	52.9	36.9
Louisville	45.9	56.9	37.9
- Los Angeles	41.9	52.9	38.9
Memphis	42.9	53.9	37.9
Miami	43.7	55.7	38.9
Milwaukee	44.9	55.9	38.9
Minn.-St. Paul	43.9	54.9	38.9
Newark	45.7	56.7	39.9
New Orleans	41.9	53.9	36.9
New York*	46.9	59.9	41.9
Norfolk	41.7	54.7	37.9
Okla. City	46.3	56.9	36.9
Omaha	44.4	56.9	39.9
Philadelphia	42.9	54.9	37.9
+ Phoenix	42.9	53.9	38.9
Pittsburgh	42.9	54.9	37.9
- Portland, Ore.	43.7	54.7	38.9
Salt Lake City	45.9	56.9	36.9
+ San Antonio	40.1	49.1	33.9
+ San Diego	41.9	52.9	39.9
+ San Francisco	42.8	53.8	38.9
+ Seattle	42.1	55.1	39.9
- Spokane	11.7	54.7	39.9
Springfield, Ill.*	43.9	56.9	40.9
St. Louis	44.9	55.9	38.9
Tampa	43.7	55.7	38.9
+ Texarkana	40.1	49.1	33.9
Tulsa	42.3	52.9	36.9
Wichita	43.9	54.9	37.9
+ Wichita Falls	40.1	49.1	33.9
Week's avg.	43.48	54.75	38.03
June avg.	43.21	54.50	37.95
May avg.	41.93	53.20	37.78
1974 to date	38.83	50.11	
1973 to date	26.09	37.35	

+ Increase, - decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday each week. They may differ from refiners' prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	28.00-32.00
Premium (99 octane)	30.00-34.00

California (rack) Los Angeles:

+ Regular (91 octane)	25.50-33.55
+ Regular (95 octane)	27.00-34.65
+ Premium (100 octane)	28.00-35.65

Chicago:

Regular (94 octane)	28.00-33.00
Premium (100 octane)	30.00-35.00

Kerosine, distillate

Chicago:

- Distillate No. 1	27.50-30.50
- Distillate No. 2	26.50-29.50

Gulf Coast (cargoes):

Kerosine (42-43)	27.50-29.00
Distillate No. 2	25.50-28.00

Mid-Continent (Group 3):

Kerosine (42-44)	22.50-28.75
Diesel oil (58 d.i. & above)	23.00-27.00
Distillate No. 1	22.00-27.50
Distillate No. 2	20.50-26.00

New York Harbor (barges):

+ Kerosine (42-44)	29.50-33.75
+ Distillate No. 2	25.75-27.55
+ Diesel fuel (48-52 d.i.)	26.80

Residual fuel

Mid-Continent (Group 3):

No. 6 (max. 1% S)	\$9.25
No. 6 (over 1% S)	\$8.25

Chicago:

No. 6 (max. 1% S)	\$13.02
No. 5 (max. 1% S)	\$13.86

New York Harbor (barges):

+ No. 6 (max. 0.3% S)	\$13.39-13.99
No. 5 (0.3% S)	\$13.59-14.57

California (marine pipeline):

Bunker C Los Angeles	\$5.01
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API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	7-12 1974	7-5 1974	7-13 1973	7-12 1974	7-5 1974	7-13 1973	7-12 1974	7-5 1974	7-13 1973
Gasoline	153	290	72	2			155	290	72
Special Naphthas		5	12					5	12
Kerosine	5	5					5	5	
Distillate	133	100	64	5		5	138	105	64
No. 4 Fuel Oil	44	59	29				44	59	29
Residual	1,825	1,691	1,412	100	29	75	1,925	1,766	1,441
Jet Fuel (Naphtha)					5				5
Jet Fuel (Kerosine)	77	65	119	47	55	22	124	87	174
Asphalt	40	31	22				40	31	22
LP-Gas	112	141	119	16	23	21	128	162	142
Petrochem Feedstocks	5	15					5	15	
Unfinished	126	137	65	53	46	46	179	183	111
Plant Condensate	83	115	116	10	10	10	93	125	126
Total Prod.	2,603	2,654	2,030	233	168	179	2,836	2,833	2,198
Canadian Crude	468	496	934	208	323	153	676	649	1,259
Other Foreign	2,282	1,864	1,429	840	682	448	3,122	2,312	2,109
Total Crude	2,750	2,360	2,363	1,048	1,005	601	3,798	2,961	3,368
Total Imports	5,353	5,014	4,393	1,201	1,173	780	6,634	5,794	5,566

Worldwide crude production

(Daily average in thousands of bbl)

	April 1974	March* 1974	Daily prod. 1973	4-month average Daily prod. 1974	Change from Vol.	%
WESTERN HEMISPHERE						
Argentina	420.0	423.0	424.0	426.0	2.0	0.5
Bolivia	50.0	50.0	50.0	50.0		
Brazil	170.0	170.0	169.0	170.0	1.0	0.6
Canada	1,810.0	1,881.0	1,819.0	1,845.0	26.0	1.4
Chile	30.0	30.0	34.0	30.0	- 4.0	- 11.8
Colombia	175.0	175.0	198.0	176.0	- 22.0	- 11.1
Ecuador	245.0	240.0	211.0	235.0	24.0	11.4
Mexico	530.0	520.0	453.0	523.0	70.0	15.5
Peru	75.0	75.0	67.0	75.0	8.0	11.9
Trinidad	170.0	170.0	163.0	173.0	10.0	6.1
United States	8,965.0	9,023.0	9,236.0	9,024.0	-212.0	- 2.3
Venezuela	3,044.0	3,179.0	3,313.0	3,186.0	-127.0	- 3.8
Total	15,684.0	15,936.0	16,137.0	15,913.0	-224.0	- 1.4
WESTERN EUROPE						
Austria	50.0	50.0	50.0	50.0		
Denmark	2.0	4.0	4.0	4.0		
France	25.0	25.0	27.0	24.0	- 3.0	- 11.1
West Germany	125.0	125.0	131.0	126.0	- 5.0	- 3.8
Italy	15.0	15.0	15.0	15.0		
Netherlands	30.0	30.0	30.0	30.0		
Norway	13.0	17.0	34.0	14.0	- 20.0	- 58.8
Spain	35.0	35.0	7.0	33.0	26.0	371.4
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	65.00	65.0	66.0	66.0		
Total	362.0	368.0	368.0	364.0	- 2.0	- 0.6
MIDDLE EAST						
Abu Dhabi	1,616.0	1,489.0	1,332.0	1,401.0	69.0	5.2
Bahrain	67.0	68.0	68.0	69.0	1.0	1.5
Dubai	241.0	250.0	220.0	230.0	10.0	4.5
Iran	6,175.0	6,125.0	5,816.0	6,142.0	326.0	5.6
Iraq	1,871.0	1,812.0	1,863.0	1,820.0	17.0	0.9
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,836.0	2,841.0	3,136.0	2,841.0	-295.0	- 9.4
Oman	296.0	292.0	284.0	296.0	12.0	4.2
Qatar	519.0	518.0	597.0	518.0	- 79.0	- 13.2
Saudi Arabia	8,653.0	8,135.0	7,229.0	8,027.0	798.0	11.0
Syria	150.0	150.0	118.0	138.0	20.0	16.9
Turkey	65.0	65.0	62.0	66.0	4.0	6.5
Total	22,589.0	21,845.0	20,765.0	21,648.0	883.0	4.3
ASIA-PACIFIC						
Afghanistan						
Australia	404.0	415.0	395.0	435.0	40.0	10.1
Burma	20.0	20.0	20.0	21.0	1.0	5.0
Brunei-Malaysia	375.0	350.0	305.0	356.0	51.0	16.7
India	150.0	150.0	148.0	149.0	1.0	0.7
Indonesia	1,413.0	1,440.0	1,236.0	1,424.0	188.0	15.2
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.5	8.5	8.5	8.5		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.5	0.5		
Total	2,387.7	2,250.7	2,129.7	2,410.7	281.0	13.2
AFRICA						
Algeria	990.0	980.0	1,109.0	962.0	- 14.7	- 13.3
Angola	20.0	20.0	14.0	20.0	6.0	42.9
Cabinda	150.0	150.0	132.0	149.0	17.0	12.9
Congo	35.0	35.0	32.0	34.0	2.0	6.3
Egypt	130.0	110.0	201.0	114.0	- 87.0	- 43.3
Gabon	165.0	165.0	129.0	162.0	33.0	25.6
Libya	1,734.0	1,882.0	2,301.0	1,898.0	-403.0	- 17.5
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,300.0	2,290.0	1,938	2,257.0	319.0	16.5
Tunisia	70.0	70.0	85.0	70.0	- 15.0	- 17.6
Total	5,595.0	5,703.0	5,942.0	5,667.0	-275.0	- 4.6
COMMUNIST						
China	860.0	860.0	600.0	860.0	260.0	43.3
Romania	280.0	280.0	275.0	280.0	5.0	1.8
U.S.S.R.†	9,028.0	8,948.0	8,280.0	8,942.5	662.5	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,278.0	10,198.0	9,255.0	10,192.5	937.5	10.1
WORLD TOTAL	56,895.7	56,300.7	54,594.7	56,195.2	1,600.5	2.9

*Figures adjusted. †Includes condensate.

Worldwide gas production

(Billion cu ft)

	April 1974	March 1974	1974 cum.
WESTERN HEMISPHERE			
Argentina	21.0	16.8	81.2
Bolivia	14.1	12.9	53.1
Brazil	4.6	3.5	15.0
Canada	271.2	268.4	1,096.4
Chile	11.9	12.0	57.6
Colombia	5.0	4.6	28.9
Ecuador	0.3	0.2	1.2
Mexico	56.3	56.4	224.2
Peru	3.5	7.9	26.6
Trinidad	4.9	4.8	25.7
United States	1,770.2	1,775.2	7,667.8
Venezuela	140.1	141.2	622.2
Total	2,303.1	2,303.9	9,899.9
WESTERN EUROPE			
Austria	10.1	9.6	37.9
Denmark			
France	24.1	24.4	95.1
West Germany	60.2	51.4	229.5
Italy	49.3	52.4	198.0
Netherlands	271.2	266.1	1,019.3
Norway			
Spain	141.2	135.4	467.9
United Kingdom	5.0	4.9	18.9
Yugoslavia			
Total	561.1	544.2	2,066.6
MIDDLE EAST			
Abu Dhabi	0.1	0.2	1.1
Bahrain			
Dubai			
Iran	140.8	141.7	569.5
Iraq	11.0	10.9	44.1
Israel	1.0	0.9	2.9
Kuwait	0.1	0.1	0.5
Oman			
Qatar	0.2	0.2	0.6
Saudi Arabia			
Syria			
Turkey			
Total	153.2	154.0	618.7
ASIA-PACIFIC			
Afghanistan	8.1	7.8	30.5
Australia	10.2	11.4	45.0
Burma	0.4	0.6	1.9
Brunei-Malaysia			
India	1.8	2.0	7.9
Indonesia	12.0	13.7	52.8
Japan	9.0	8.4	33.7
Pakistan	10.1	11.2	43.6
Taiwan	3.8	4.2	15.1
Thailand			
Total	55.4	59.3	230.5
AFRICA			
Algeria	2.0	2.1	7.6
Angola	3.0	2.3	9.3
Cabinda			
Congo	0.2	0.4	1.6
Egypt	3.0	2.9	10.8
Gabon	1.0	1.2	4.4
Libya	2.1	1.9	8.9
Morocco	1.5	2.0	7.4
Nigeria	5.0	4.7	17.7
Tunisia	0.2	0.4	3.1
Total	18.0	17.9	70.8
COMMUNIST			
China	16.0	15.6	59.7
Romania	70.1	77.1	301.8
U.S.S.R.†	737.7	776.6	3,000.5
Other	35.0	37.8	204.9
Total	858.8	907.1	3,566.8
WORLD TOTAL	3,949.6	3,986.4	16,453.3

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Worldwide crude production

(Daily average in thousands of bbl)

	Mar. 1974	Feb.* 1974	Daily prod. 1973	6-month average Daily prod. 1974	Change from Vol. %	
WESTERN HEMISPHERE						
Argentina	430.0	430.0	426.0	430.0	4.0	0.9
Bolivia	50.0	50.0	50.0	50.0		
Brazil	170.0	170.0	168.0	170.0	2.0	1.2
Canada	1,881.0	1,844.0	1,830.0	1,857.0	27.0	1.5
Chile	30.0	30.0	34.0	30.0	- 4.0	- 11.8
Colombia	175.0	176.0	198.0	176.0	- 22.0	- 11.1
Ecuador	230.0	228.0	219.0	228.0	9.0	4.1
Mexico	580.0	580.0	450.0	580.0	130.0	28.9
Peru	75.0	75.0	67.0	76.0	9.0	13.4
Trinidad	170.0	171.0	165.0	173.0	8.0	4.8
United States	9,023.0	9,047.0	9,238.0	9,044.0	- 194.0	- 2.1
Venezuela	3,150.0	3,233.0	3,297.0	3,223.0	- 74.0	- 2.2
Total	15,964.0	16,034.0	16,142.0	16,037.0	- 105.0	- 0.7
WESTERN EUROPE						
Austria	50.0	50.0	50.0	50.0		
Denmark	4.0	4.0	4.0	4.0		
France	25.0	25.0	27.0	25.0	- 2.0	- 7.4
West Germany	125.0	125.0	132.0	125.0	- 7.0	- 5.3
Italy	15.0	15.0	15.0	15.0		
Netherlands	30.0	32.0	29.0	30.0	1.0	3.4
Norway	17.0	25.0	36.0	15.0	- 21.0	- 58.3
Spain	25.0	25.0	3.0	25.0	22.0	733.3
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	60.0	60.0	65.0	59.0	- 6.0	- 9.2
Total	353.0	363.0	363.0	350.0	- 13.0	- 3.6
MIDDLE EAST						
Abu Dhabi	1,489.0	1,273.0	1,318.0	1,329.0	11.0	0.8
Bahrain	68.0	69.0	68.0	69.0	1.0	1.5
Dubai	250.0	250.0	217.0	225.0	9.0	4.1
Iran	6,125.0	6,167.0	5,832.0	6,130.0	298.0	5.1
Iraq	1,812.0	1,802.0	1,699.0	1,803.0	104.0	6.1
Israel	100.0	100.0	100.0	100.0		
Kuwait	2,841.0	2,849.0	3,282.0	2,842.0	- 440.0	- 13.4
Oman	292.0	295.0	281.0	295.0	14.0	5.0
Qatar	518.0	515.0	599.0	517.0	- 82.0	- 13.7
Saudi Arabia	8,135.0	7,795.0	7,185.0	7,818.0	633.0	8.8
Syria	100.0	50.0	113.0	75.0	- 38.0	- 33.6
Turkey	70.0	70.0	61.0	69.0	8.0	13.1
Total	21,800.0	21,235.0	20,755.0	21,273.0	518.0	2.5
ASIA-PACIFIC						
Australia	376.0	490.0	386.0	442.0	56.0	14.5
Burma	20.0	20.0	20.0	21.0	1.0	5.0
Brunei-Malaysia	350.0	350.0	302.0	350.0	48.0	15.9
India	150.0	150.0	149.0	152.0	3.0	2.0
Indonesia	1,440.0	1,435.0	1,218.0	1,428.0	210.0	17.2
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.5	8.5	8.5	8.5		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,361.7	2,320.7	2,100.7	2,418.7	318.0	15.1
AFRICA						
Algeria	980.0	980.0	1,107.0	952.0	- 155.0	- 14.0
Angola	20.0	20.0	14.0	20.0	6.0	42.9
Cabinda	150.0	150.0	132.0	149.0	17.0	12.9
Congo	35.0	35.0	26.0	34.0	8.0	30.8
Egypt	110.0	110.0	195.0	109.0	- 86.0	- 44.1
Gabon	180.0	180.0	126.0	180.0	54.0	42.9
Libya	1,882.0	1,945.0	2,290.0	1,953.0	- 337.0	- 14.7
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,290.0	2,260.0	1,932.0	2,249.0	317.0	16.4
Tunisia	70.0	70.0	85.0	70.0	- 15.0	- 17.6
Total	5,718.0	5,751.0	5,908.0	5,717.0	- 191.0	3.2
COMMUNIST						
China	860.0	860.0	600.0	860.0	260.0	43.3
Romania	280.0	280.0	275.0	280.0	5.0	1.8
U.S.S.R.†	8,948.0	8,838.0	8,260.0	8,922.0	662.0	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,198.0	10,088.0	9,235.0	10,172.0	937.0	10.2
WORLD TOTAL	56,394.7	55,791.7	54,503.7	55,967.7	1,464.0	2.7

*Figures adjusted. †Includes gas liquids.

Worldwide gas production

	Mar. '74	Feb. '74	1974 cum.
Argentina	16.8	19.5	60.2
Bolivia	12.9	13.1	39.0
Brazil	3.5	3.5	10.4
Canada	268.4	274.5	825.2
Chile	12.0	11.9	45.7
Colombia	4.6	9.6	23.9
Ecuador	0.2	0.3	0.9
Mexico	56.4	55.7	167.9
Peru	7.9	8.1	23.1
Trinidad	4.8	4.8	20.8
United States	1,775.2	2,111.2	5,897.6
Venezuela	141.2	169.7	482.1
Total	2,303.9	2,681.9	7,596.8
Austria	9.6	9.6	27.8
Denmark			
France	24.4	23.4	71.0
West Germany	51.4	51.4	169.3
Italy	52.4	49.6	148.7
Netherlands	266.1	241.0	748.1
Norway			
Spain	135.4	86.4	326.7
United Kingdom	4.9	4.9	13.9
Yugoslavia			
Total	544.2	466.3	1,505.5
Abu Dhabi			
Bahrain	0.2	0.3	1.0
Dubai			
Iran	141.7	141.3	428.7
Iraq	10.9	11.1	33.1
Israel	0.9	0.9	1.9
Kuwait	0.1	0.1	0.4
Oman			
Qatar	0.2	0.1	0.4
Saudi Arabia			
Syria			
Turkey			
Total	154.0	153.8	465.5
Australia	7.8	6.9	22.4
Burma	11.4	10.9	34.8
Brunei-Malaysia	0.6	0.4	1.5
India			
Indonesia	2.0	1.9	6.1
Japan	13.7	13.7	40.8
Pakistan	8.4	8.4	24.7
Taiwan	11.2	11.2	33.5
Thailand	4.2	4.1	11.3
Total	59.3	57.5	175.1
Algeria	2.1	1.9	5.6
Angola	2.3	1.9	6.3
Cabinda			
Congo	0.4	0.5	1.4
Egypt	2.9	2.5	7.8
Gabon	1.2	1.1	3.4
Libya	1.9	2.4	6.8
Morocco	2.0	1.9	5.9
Nigeria	4.7	4.7	12.7
Tunisia	0.4	0.4	2.9
Total	17.9	17.3	52.8
China	15.6	14.9	43.7
Romania	77.1	77.1	231.7
U.S.S.R.†	776.6	709.5	2,262.7
Other	37.8	60.9	169.9
Total	907.1	862.4	2,708.0
WORLD TOTAL	3,986.4	4,239.2	12,503.7

*Figures adjusted.

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday each week. They may differ from refiners' prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):

Regular (92 octane)	28.00-30.00
Premium (99 octane)	30.00-32.00

Gulf Coast (cargoes for coastwise or export movements):

Regular (94 octane)	30.50-34.50
Premium (100 octane)	32.25-36.25

California (rack) Los Angeles:

Regular (91 octane)	24.50-33.55
Regular (95 octane)	24.70-34.65
Premium (100 octane)	26.00-35.65

Chicago:

Regular (94 octane)	31.00-36.00
Premium (100 octane)	33.00-38.00

Kerosine, distillate

Chicago:

Distillate No. 1	30.00-34.50
Distillate No. 2	29.00-33.50

Gulf Coast (cargoes):

-Kerosine (42-43)	26.00-28.50
-Distillate No. 2	24.00-26.50

Mid-Continent (Group 3):

Kerosine (42-44)	25.00
Diesel oil (58 d.i. & above)	24.75
Distillate No. 1	23.00
Distillate No. 2	22.00

New York Harbor (barges):

Kerosine (42-44)	27.50-33.75
Distillate No. 2	24.50-26.45
Diesel fuel (48-52 d.i.)	24.80

Residual fuel

Mid-Continent (Group 3):

+No. 6 (max. 1% S)	\$9.00
+No. 6 (over 1% S)	\$8.00

Chicago:

No. 6 (max. 1% S)	\$12.60
No. 5 (max. 1% S)	\$13.44

Gulf Coast (cargoes):

Bunker C fuel (0.6% S)	\$4.95
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New York Harbor (barges):

No. 6 (max. 0.3% S)	\$13.36-13.39
-No. 5 (max. 1.0% S)	\$12.17
No. 5 (0.3% S)	\$13.56-14.57

California (marine pipeline):

Bunker C Los Angeles	\$5.01
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Gasoline prices

(Suggested prices for major-brand regular)

	Price ex. tax 5-21-74	Pump price 5-21-74	Pump price 5-22-73
Albany	45.9	57.9	39.9
Albuquerque	43.9	54.9	37.9
Anarillo	38.7	47.7	33.9
Atlanta	40.2	51.7	38.9
Baltimore	42.9	55.9	38.9
Birmingham	42.9	54.9	37.9
Boston*	40.2	51.7	38.9
Buffalo	45.9	57.9	39.9
Charlotte	42.9	55.9	38.9
Cheyenne	45.9	56.9	39.9
Chicago*	45.6	58.6	40.4
Cleveland	43.9	54.9	37.9
Corpus Christi	38.2	48.2	33.9
Dallas	39.2	48.2	33.9
Denver	44.9	55.9	38.9
Des Moines	39.9	50.9	37.9
Detroit	42.5	55.5	39.9
Fort Worth	39.2	48.2	33.9
Houston	41.9	50.9	33.9
Indianapolis	44.9	56.9	39.9
Jacksonville	42.9	54.9	37.9
Kansas City	43.9	54.9	37.9
Little Rock	38.4	49.9	36.9
Louisville	45.9	56.9	37.9
Los Angeles	41.8	52.8	36.9
Memphis	39.9	50.9	37.9
Miami	39.7	51.7	38.9
Milwaukee	44.9	55.9	38.9
Minn.-St. Paul	40.9	51.9	38.9
Newark	41.7	52.7	39.9
New Orleans	41.9	53.9	36.9
New York*	46.9	59.9	41.9
Norfolk	37.7	50.7	37.9
Oklahoma City	43.3	53.9	36.9
Omaha	44.4	56.9	38.9
Philadelphia	42.9	54.9	37.9
Phoenix	41.7	52.7	37.9
Pittsburgh	42.9	54.9	37.9
Portland, Ore.	42.7	53.7	36.9
Salt Lake City	42.9	53.9	36.9
San Antonio	38.7	47.7	33.9
San Diego	41.7	52.7	36.9
San Francisco	42.5	53.5	36.9
Seattle	40.2	53.2	37.9
Spokane	41.0	54.0	37.9
Springfield, Ill.*	40.9	53.9	40.9
St. Louis	44.9	55.9	38.9
Tampa	35.2	47.2	38.9
Texarkana	38.7	47.7	33.9
Tulsa	39.3	49.9	36.9
Wichita	43.9	54.9	37.9
Wichita Falls	38.7	47.7	33.9
Week's avg.	41.97	53.27	37.76
Apr. avg.	38.73	50.01	34.41
Mar. avg.	36.93	49.20	34.52
1974 to date	37.14	48.41	
1973 to date	25.87	37.12	

+ Increase, - decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	5-17 1974	5-10 1974	5-18 1973	5-17 1974	5-10 1974	5-18 1973	5-17 1974	5-10 1974	5-18 1973
Gasoline	281	151	77	43	4		324	155	77
Special naphthas									
Kerosine									
Distillate	251	168	153	5	5		256	173	153
No. 4 fuel oil	59	63	155				59	63	155
Residual	1,651	1,745	1,718	50	50	22	1,701	1,795	1,740
Jet fuel (naphtha)			4			10			14
Jet fuel (kerosine)	67	80	94	42	42	63	109	122	157
Asphalt	106	37	35				106	37	35
LP-gas	186	184	115	10	10	24	196	194	139
Petrochem feedstocks	20	20	7				20	20	7
Unfinished	100	209	82	83	13	27	183	222	109
Plant condensate	55	61	85	10	10	5	65	71	90
Total prod.	2,776	2,718	2,525	243	134	151	3,019	2,852	2,676
Canadian crude	647	652	557	201	149	268	848	801	825
Other foreign	1,774	1,505	1,729	717	696	524	2,491	2,201	2,253
Total crude	2,421	2,157	2,286	918	845	792	3,339	3,002	3,078
Total imports	5,197	4,875	4,811	1,161	979	943	6,358	5,854	5,754

Worldwide crude production

(Daily average in thousands of bbl)

	Feb. 1974	Jan. 1974	Daily prod. 1973	2-month average Daily prod. 1974	Change from Vol.	%
WESTERN HEMISPHERE						
Argentina	430.0	430.0	429.0	430.0	1.0	0.2
Bolivia	50.0	50.0	50.0	50.0		
Brazil	170.0	170.0	168.0	170.0	2.0	1.2
Canada	1,844.0	1,845.0	1,819.0	1,845.0	26.0	1.4
Chile	31.0	31.0	34.0	31.0	- 3.0	- 8.8
Colombia	200.0	200.0	200.0	200.0		
Ecuador	230.0	230.0	214.0	230.0	16.0	7.5
Mexico	485.0	485.0	450.0	485.0	35.0	7.8
Peru	75.0	75.0	67.0	75.0	8.0	11.9
Trinidad	165.0	165.0	165.0	165.0		
United States	9,047.0	9,061.0	9,271.9	9,054.0	-217.0	- 2.3
Venezuela	3,220.0	3,274.0	3,283.0	3,248.0	- 35.0	- 1.1
Total	15,947.0	16,016.0	16,150.0	15,983.0	-167.0	- 0.1
WESTERN EUROPE						
Austria	50.0	50.0	50.0	50.0		
Denmark	4.0	4.0	4.0	4.0		
France	25.0	24.0	27.0	24.0	- 3.0	-11.1
West Germany	125.0	125.0	132.0	125.0	- 7.0	- 5.3
Italy	15.0	15.0	15.0	15.0		
Netherlands	32.0	28.0	30.0	30.0		
Norway	25.0	2.0	33.0	13.0	- 20.0	-60.6
Spain	20.0	20.0	3.0	20.0	17.0	556.7
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	70.0	70.0	62.0	70.0	8.0	12.9
Total	368.0	340.0	358.0	353.0	- 5.0	- 1.4
MIDDLE EAST						
Abu Dhabi	1,263.0	1,210.0	1,314.0	1,235.0	- 79.0	- 6.0
Bahrain	69.0	70.0	68.0	70.0	2.0	2.9
Dubai	250.0	180.0	213.0	213.0		
Iran	6,157.0	6,103.0	5,831.0	6,129.0	298.0	5.1
Iraq	1,802.0	1,794.0	1,553.0	1,798.0	245.0	15.8
Israel	100.0	100.0	110.0	100.0	- 10.0	- 9.1
Kuwait	2,849.0	2,838.0	3,562.0	2,843.0	-719.0	-20.2
Oman	295.0	299.0	290.0	297.0	17.0	6.1
Qatar	517.0	518.0	596.0	518.0	- 78.0	-13.1
Saudi Arabia	7,795.0	7,522.0	7,029.0	7,652.0	623.0	8.9
Syria	50.0	50.0	115.0	50.0	- 65.0	-56.5
Turkey	70.0	70.0	61.0	70.0	9.0	14.8
Total	21,217.0	20,754.0	20,732.0	20,975.0	243.0	1.2
ASIA-PACIFIC						
Afghanistan						
Australia	490.0	464.0	404.0	476.0	72.0	17.8
Burma	20.0	20.0	20.0	20.0		
Brunei-Malaysia	350.0	350.0	302.0	350.0	48.0	15.9
India	150.0	150.0	148.0	150.0	2.0	1.4
Indonesia	1,435.0	1,450.0	1,216.0	1,443.0	227.0	18.7
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.5	8.5	8.5	8.5		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	2.0	0.2	0.2	0.2		
Total	2,470.7	2,459.0	2,115.7	2,464.7	349.0	16.5
AFRICA						
Algeria	980.0	960.0	1,106.0	969.0	-137.0	-12.4
Angola	15.0	15.0	14.0	15.0	1.0	7.1
Cabinda	150.0	150.0	132.0	150.0	18.0	13.6
Congo	35.0	35.0	15.0	35.0	20.0	133.3
Egypt	80.0	80.0	199.0	80.0	-119.0	-40.2
Gabon	160.0	156.0	120.0	158.0	38.0	31.7
Libya	1,945.0	2,032.0	2,285.0	1,991.0	-294.0	-12.9
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,185.0	2,185.0	1,930.0	2,185.0	255.0	13.2
Tunisia	82.0	82.0	85.0	82.0	- 3.0	- 3.5
Total	5,633.0	5,696.0	5,887.0	5,666.0	-221.0	- 3.8
COMMUNIST						
China	860.0	860.0	600.0	860.0	260.0	43.3
Romania	280.0	280.0	275.0	280.0	5.0	1.8
U.S.S.R.†	8,838.0	8,948.0	8,236.0	8,896.0	660.0	8.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	10,088.0	10,198.0	9,211.0	10,146.0	935.0	10.2
WORLD TOTAL	55,723.7	55,463.7	54,453.7	55,587.7	1,134.0	2.1

*Figures adjusted.
†Includes gas liquids.

Worldwide gas production

(Billion cu ft)

	Feb. '74	Jan. '74	1974 total
WESTERN HEMISPHERE			
Argentina	19.5	23.9	43.4
Bolivia	13.1	13.0	25.1
Brazil	3.5	3.4	6.9
Canada	274.5	282.3	556.8
Chile	11.9	21.8	33.7
Colombia	9.6	9.7	19.3
Ecuador	0.3	0.4	0.7
Mexico	55.7	55.8	111.5
Peru	8.1	7.1	15.2
Trinidad	4.8	11.2	16.0
United States	2,111.2	2,011.2	4,122.4
Venezuela	169.7	171.2	340.9
Total	2,681.9	2,611.0	5,292.9
WESTERN EUROPE			
Austria	9.6	8.6	18.2
Denmark			
France	23.4	23.2	46.6
West Germany	51.4	66.5	117.9
Italy	49.6	46.7	96.3
Netherlands	241.0	241.2	482.0
Norway			
Spain			
United Kingdom	86.4	104.9	191.3
Yugoslavia	4.9	4.1	9.0
Total	466.3	495.2	961.5
MIDDLE EAST			
Abu Dhabi	0.3	0.5	0.8
Bahrain			
Dubai			
Iran	141.3	145.7	287.0
Iraq	11.1	11.1	22.2
Israel	0.9	0.1	1.0
Kuwait	0.1	0.2	0.3
Oman			
Qatar	0.1	0.1	0.2
Saudi Arabia			
Syria			
Turkey			
Total	153.8	157.7	311.5
ASIA-PACIFIC			
Afghanistan	6.9	7.7	14.6
Australia	10.9	12.5	23.4
Burma	0.4	0.5	0.9
Brunei-Malaysia			
India	1.9	2.2	4.1
Indonesia	13.7	13.4	27.1
Japan	8.4	7.9	16.3
Pakistan	11.2	11.1	22.3
Taiwan	4.1	3.0	7.1
Thailand			
Total	57.5	58.3	115.8
AFRICA			
Algeria	1.9	1.6	3.5
Angola	1.9	2.1	4.0
Cabinda			
Congo	0.5	0.5	1.0
Egypt	2.5	2.4	4.9
Gabon	1.1	1.1	2.2
Libya	2.4	2.5	4.9
Morocco	1.9	2.0	3.9
Nigeria	4.7	3.3	8.0
Tunisia	0.4	2.1	2.5
Total	17.3	17.6	34.9
COMMUNIST			
China	14.9	13.2	28.1
Romania	77.1	77.5	154.6
U.S.S.R.†	709.5	720.1	1,429.6
Other	60.9	71.2	132.1
Total	862.4	882.0	1,744.4
WORLD TOTAL	4,239.2	4,221.8	8,461.0

Refined-products prices

Following quotations are realistic spot prices for refined products moving intrastate on Tuesday each week. They may differ from refiners' prices for branded products. They should not be considered as postings.

Light products are in cents per gallon. Residual prices are in dollars per barrel.

Gasoline

Mid-Continent (Group 3):	
+ Regular (92 octane)	30.00
+ Premium (99 octane)	32.00

Gulf Coast (cargoes for coastwise or export movements):	
+ Regular (94 octane)	30.50-34.50
+ Premium (100 octane)	32.25-36.25

California (rack) Los Angeles:	
Regular (91 octane)	24.50-30.25
Regular (95 octane)	24.70-31.35
Premium (100 octane)	26.00-32.40

Chicago:	
+ Regular (94 octane)	31.00-36.00
+ Premium (100 octane)	33.00-38.00

Kerosine, distillate

Chicago:	
+ Distillate No. 1	34.50
+ Distillate No. 2	33.50
Gulf Coast (cargoes):	
+ Kerosine (41-43)	30.50-34.50
Distillate No. 2	27.00-38.00

Mid-Continent (Group 3):	
+ Kerosine (42-44)	24.00
+ Diesel oil (58 d.i. & above)	23.75
+ Distillate No. 1	23.00
+ Distillate No. 2	22.00

New York Harbor (barges):	
Kerosine (42-44)	24.50-33.75
Distillate No. 2	21.50-26.45
Diesel fuel (48-52 d.i.)	21.80

Residual fuel

Mid-Continent (Group 3):	
No. 6 (max. 1% S)	\$7.00
No. 6 (over 1% S)	\$6.50

Chicago:	
+ No. 6 (max. 1% S)	\$11.70
+ No. 5 (max. 1% S)	\$12.60

Gulf Coast (cargoes):	
Bunker C fuel (0.6% S)	\$4.95

New York Harbor (barges):	
No. 6 (max. 0.3% S)	\$5.61
No. 5 (max. 1.0% S)	\$5.16
No. 5 (0.9% S)	\$5.70-6.12

California (marine pipeline):	
Bunker C Los Angeles	\$5.01

Gasoline prices

(Major-brand regular)

	Price ex. tax 4-16-74	Pump price 4-16-74	Pump price 4-17-73
Albany	43.9	55.9	39.9
Albuquerque	37.9	48.9	37.9
Amarillo	31.9	40.9	33.9
Atlanta	35.7	47.2	37.9
Baltimore	40.9	53.9	38.9
Birmingham	40.9	52.9	37.9
Boston*	35.7	47.2	37.9
Buffalo	43.9	55.9	39.9
Charlotte	40.9	53.9	38.9
Cheyenne	38.9	49.9	39.9
Chicago*	43.6	56.6	40.4
Cleveland	41.9	52.9	37.9
Corpus Christi	31.4	41.4	33.9
Dallas	32.4	41.4	33.9
Denver	38.9	49.9	38.9
Des Moines	39.9	50.9	37.9
Detroit	40.5	53.5	39.9
Fort Worth	32.4	41.4	33.9
Houston	32.4	41.4	33.9
Indianapolis	42.9	54.9	37.9
Jacksonville	40.9	52.9	37.9
Kansas City	39.9	50.9	37.9
Little Rock	38.4	49.9	36.9
Louisville	43.9	54.9	37.9
+ Los Angeles	40.8	51.8	35.9
Memphis	39.9	50.9	37.9
Miami	35.2	47.2	37.9
Milwaukee	42.9	53.9	38.9
Minn.-St. Paul	40.9	51.9	38.9
Newark	37.2	48.2	38.9
New Orleans	39.9	51.9	36.9
New York*	44.9	57.9	41.9
Norfolk	33.2	46.2	36.9
Okla. City	39.3	49.9	36.9
Omaha	42.4	54.9	39.9
Philadelphia	40.9	52.9	37.9
+ Phoenix	40.5	51.5	37.9
Pittsburgh	40.9	52.9	37.9
+ Portland, Ore.	41.1	52.1	36.9
Salt Lake City	36.9	47.9	36.9
San Antonio	31.9	40.9	33.9
+ San Diego	40.3	51.3	36.9
+ San Francisco	41.1	52.1	36.9
+ Seattle	38.9	51.9	37.9
+ Spokane	39.5	52.5	37.9
Springfield, Ill.*	40.9	53.9	40.9
St. Louis	40.9	51.9	38.9
Tampa	35.2	47.2	37.9
Texarkana	31.9	40.9	32.9
Tulsa	39.3	49.9	36.9
Wichita	41.9	52.9	37.9
Wichita Falls	31.9	40.9	33.9
Week's avg.	38.86	50.15	37.56
Mar. avg.	36.93	48.20	37.30
Feb. avg.	34.45	45.75	36.79
1974 to date	35.87	47.14	
1973 to date	25.58	36.92	

+ Increase, — decrease from previous week. *Pump price includes local tax ranging from 0.5 to 2.0 cents/gal.

API imports of crude and products

(Thousands of barrels daily)

	DISTRICTS 1-4			DISTRICT 5			TOTAL U.S.		
	4-12 1974	4-5 1974	4-13 1973	4-12 1974	4-5 1974	4-13 1973	4-12 1974	4-5 1974	4-13 1973
Gasoline	136	156	82	10	10		146	166	82
Special naphthas									
Kerosine	1	1					1	1	
Distillate	128	135	140	10	10	3	138	145	143
No. 4 fuel oil	96	72	90				96	72	90
Residual	1,467	1,585	1,890	40	40	30	1,507	1,625	1,920
Jet fuel (naphtha)	5	5	5	8	8	10	13	13	15
Jet fuel (kerosine)	91	68	95	53	52	45	144	120	140
Asphalt	37	10	12				37	10	12
LP-gas	135	137	88	18	27	17	153	164	105
Petrochem feedstocks	8	8	51				8	8	51
Unfinished	181	171	99	55	28	20	236	199	119
Plant condensate	85	85	100	10	10		95	95	100
Total prod.	2,370	2,433	2,652	204	185	125	2,574	2,618	2,777
Canadian crude	589	691	682	231	186	260	820	877	942
Other foreign	1,486	1,315	1,515	549	392	194	2,035	1,707	1,709
Total crude	2,075	2,006	2,197	780	578	454	2,855	2,584	2,651
Total imports	4,445	4,439	4,849	984	763	579	5,429	5,202	5,428

Worldwide crude production

(Daily average in thousands of bbl)

	Dec. 1973	Nov. 1973	Daily prod. 1972	12-month average Daily prod. 1973	Change from Vol.	%
WESTERN HEMISPHERE						
Argentina	420.0	415.0	433.0	418.0	- 15.0	- 3.5
Bolivia	47.0	47.0	44.0	47.0	3.0	6.8
Brazil	170.0	170.0	165.0	169.0	4.0	2.4
Canada	1,335.0	1,831.0	1,535.0	1,798.0	263.0	17.1
Chile	31.0	31.0	34.0	32.0	- 2.0	- 5.9
Colombia	200.0	200.0	198.0	199.0	1.0	0.5
Ecuador	210.0	210.0	79.0	204.0	125.0	158.2
Mexico	480.0	480.0	441.0	465.0	24.0	5.4
Peru	74.0	74.0	67.0	69.0	2.0	3.0
Trinidad	165.0	165.0	142.0	164.0	22.0	15.5
United States	9,092.0	9,110.0	9,451.0	9,189.0	-262.0	- 2.8
Venezuela	3,330.0	3,384.0	3,220.0	3,364.0	144.0	4.5
Total	16,054.0	16,117.0	15,809.0	16,118.0	309.0	2.0
WESTERN EUROPE						
Austria	48.0	48.0	47.0	49.0	2.0	4.3
Denmark	4.0	4.0	4.0	4.0		
France	25.0	25.0	30.0	26.0	- 4.0	- 13.3
West Germany	125.0	124.9	138.0	129.3	- 9.0	- 6.5
Italy	15.0	15.0	21.0	15.0	- 6.0	- 28.6
Netherlands	26.0	26.2	31.0	29.0	- 2.0	- 6.5
Norway	3.5	19.3	33.0	32.0	- 1.0	- 3.0
Spain	20.0	20.0	3.0	16.0	13.0	433.3
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	70.0	70.0	65.0	68.0	3.0	4.6
Total	338.5	354.4	374.0	370.0	- 4.0	- 0.1
MIDDLE EAST						
Abu Dhabi	1,016.4	1,153.0	1,050.0	1,298.0	248.0	23.6
Bahrain	68.6	68.7	70.0	68.0	- 2.0	- 2.9
Dubai	141.0	140.0	153.0	220.0	67.0	43.8
Iran	6,070.5	6,009.0	5,021.0	5,861.0	840.0	16.7
Iraq	2,136.5	2,026.0	1,446.0	1,964.0	518.0	35.8
Israel	50.0		108.0	88.0	- 20.0	- 18.5
Kuwait	2,555.8	2,582.0	3,285.0	3,024.0	-261.0	- 7.9
Oman	302.0	302.0	282.0	293.0	11.0	3.9
Qatar	460.4	467.0	482.0	570.0	88.0	18.3
Saudi Arabia	6,615.8	6,269.4	6,019.0	7,607.0	1,588.0	26.4
Syria	50.0		120.0	99.0	- 21.0	- 17.5
Turkey	70.0	70.0	65.0	66.0	1.0	1.5
Total	19,537.0	19,086.7	18,101.0	21,158.0	3,057.0	16.9
ASIA-PACIFIC						
Afghanistan						
Australia	422.0	433.0	341.0	419.0	78.0	22.9
Burma	20.0	20.0	19.0	20.0	1.0	5.3
Brunei-Malaysia	340.0	340.0	276.0	320.0	44.0	15.9
India	150.0	150.0	151.0	148.0	- 3.0	- 2.0
Indonesia	1,400.0	1,391.0	1,060.0	1,324.0	264.0	24.9
Japan	15.0	15.0	15.0	15.0		
Pakistan	8.5	8.5	8.5	8.5		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.3	0.3	0.3	0.3		
Total	2,359.8	2,359.8	1,872.8	2,256.8	384.0	20.5
AFRICA						
Algeria	860.0	880.0	1,064.0	1,070.0	6.0	0.6
Angola	15.0	15.0	12.0	14.0	2.0	16.7
Cabinda	150.0	150.0	128.0	140.0	12.0	9.4
Congo	50.0	50.0	7.0	42.0	35.0	500.0
Egypt	30.0	30.0	212.0	165.0	- 47.0	- 22.2
Gabon	160.0	160.0	126.0	147.0	21.0	16.7
Libya	1,769.0	1,766.0	2,215.0	2,187.0	- 28.0	- 1.3
Morocco	1.0	1.0	1.0	1.0		
Nigeria	2,255.2	2,238.3	1,817.0	2,053.0	236.0	13.0
Tunisia	82.0	82.0	83.0	83.0		
Total	5,372.2	5,372.3	5,665.0	5,902.0	237.0	4.2
COMMUNIST						
China	860.0	860.0	600.0	860.0	260.0	43.3
Romania	275.0	275.0	275.0	275.0		
U.S.S.R.	8,800.0	8,760.0	7,869.0	8,428.0	551.0	7.0
Other	110.0	110.0	100.0	110.0	10.0	
Total	10,045.0	10,005.0	8,844.0	9,665.0	821.0	9.3
WORLD TOTAL	53,706.5	53,295.2	50,665.8	55,469.8	4,804.0	9.5

*Figures adjusted

Worldwide gas production

(Billion cu ft)

	Dec. '73	Nov. '73	1973 total
Argentina	21.2	22.2	241.9
Bolivia	13.5	13.4	151.5
Brazil	4.2	3.5	48.1
Canada	276.7	266.6	3,241.4
Chile	11.9	12.8	238.2
Colombia	10.0	9.9	126.2
Ecuador	0.4	0.5	6.4
Mexico	60.1	55.8	686.2
Peru	7.1	6.6	65.9
Trinidad	11.1	12.1	137.4
United States	1,901.7	1,899.8	22,854.0
Venezuela	168.4	172.0	1,741.4
Total	2,486.3	2,475.2	29,538.6
Austria	6.8	4.6	72.2
Denmark			
France	20.7	22.2	258.5
West Germany	49.8	61.2	590.1
Italy	50.2	38.6	486.9
Netherlands	200.7	140.1	2,589.7
Norway			
Spain			
United Kingdom	101.6	90.1	1,151.6
Yugoslavia	5.0	3.4	66.2
Total	434.8	360.2	5,215.2
Abu Dhabi			
Bahrain	1.0	1.2	20.3
Dubai			
Iran	144.6	143.3	1,689.3
Iraq	11.2	12.0	155.3
Israel	0.1	0.1	3.1
Kuwait	0.2	0.1	50.6
Oman			
Qatar	0.1	0.1	7.4
Saudi Arabia			
Syria			
Turkey			
Total	157.2	156.8	1,926.0
Afghanistan	4.0	13.3	80.7
Australia	15.2	12.5	149.3
Burma	0.3	0.7	6.7
Brunei-Malaysia			
India	1.0	2.0	18.1
Indonesia	7.2	13.0	129.1
Japan	7.1	8.1	87.2
Pakistan	7.0	7.8	128.1
Taiwan	2.0	2.1	28.7
Thailand			
Total	43.8	59.5	627.9
Algeria	1.6	1.7	119.7
Angola	1.8	2.0	24.2
Cabinda			
Congo	0.1	0.5	2.9
Egypt	2.0	3.2	30.7
Gabon	0.0	0.1	1.6
Libya	5.0	4.9	43.2
Morocco	1.7	1.9	37.2
Nigeria	4.5	4.2	60.4
Tunisia	4.6	4.6	20.8
Total	21.3	23.1	340.7
China	12.0	12.8	158.1
Romania	110.4	77.4	1,302.6
U.S.S.R.	673.2	720.1	8,262.7
Other	60.9	27.6	631.1
Total	856.5	837.9	10,354.5
WORLD TOTAL	3,999.9	3,912.7	48,002.9

bitrarily, been assigned to this area.

CANADA

Arctic Canada's petroleum potential lies in five areas; the Baffin Shelf, northern part of Hudson Bay, Northwest Territories and Yukon mainland, the Beaufort basin (Mackenzie Delta), and the Arctic Islands.

It is estimated that these sedimentary basins hold a petroleum potential of 72 billion bbl of oil and 530 Tcf of gas. This comprises about 23% of the oil and 21% of the gas potential of the world's Arctic regions, Table 1.

The bulk of Canada's Arctic potential lies in the Beaufort basin and the Arctic Islands that together account for 81% of the oil and 86% of the gas potentials assigned to Arctic Canada. The Arctic Islands area itself contains potentials estimated at 46 billion bbl of oil and 357 Tcf of gas that comprise 64% of the oil and 67% of the gas potential of Arctic Canada or some 14% of the world's Arctic petroleum potential.

Baffin Shelf. The Baffin Shelf is a narrow belt of sediments lying offshore along the western edge of Baffin Bay and Davis Strait. Here, in waters up to 5,000 ft deep, geophysical data indicate the presence of a sedimentary section up to 20,000 ft thick. This section is assumed to consist largely of Cretaceous and younger deltaic complexes involved in a series of block faults that could provide structural traps.

A potential of 6 billion bbl of oil and 40 Tcf of gas has been tentatively assigned to the Baffin Shelf.

Petroleum potential north of 60th parallel

Table 1

	Oil potential (billion bbl)	Gas potential (Tcf)
World		
Russia	200	1,600
Alaska	40	300
Canada	72	530
Western Europe and other	7	55
Total	319	2,485
Canada		
Baffin Shelf	6	40
Hudson Bay	1	3
Mainland N.W.T. and Yukon	7	30
Beaufort basin	12	100
Arctic Islands	46	357
Total	72	530
Arctic Islands		
Lowlands	7	42
Fold belt	8	50
Sverdrup basin	25	215
Arctic Coastal plain	6	50
Total	46	357

Hudson Bay. The Hudson Bay basin is a remnant of a basin occupying a large depression on the pre-Cambrian shield. Generally, basins of this type have low hydrocarbon yields.

The present basin lies almost entirely under the waters of Hudson Bay and contains only a relatively thin section of early Paleozoic beds.

Considering the basin type and the age of the sediments, the potential here is small, in the order of 1 billion bbl of oil and 3 Tcf of gas.

Northwest Territories and Yukon mainland. The sedimentary area of the Northwest Territories and Yukon mainland is an extension of the west-

ern Canada basin.

The sedimentary section here thickens westward from the preCambrian shield into the Cordillera where several intermontane basins.

Exploration and development drilling, particularly for gas, is expected to increase markedly in the next few years as a result of both higher gas prices and the prospect of a gas pipeline extending to southern markets along the Mackenzie River valley.

A total potential of 7 billion bbl of oil and 30 Tcf of gas has been assigned to the Northwest Territories and Yukon mainland, exclusive of the Mackenzie Delta region.

Beaufort Basin (Mackenzie Delta). The Mackenzie Delta area appears to be a landward embayment of sub-basin of the Arctic Coastal Plain basin, the bulk of which lies on the Continental Shelf.

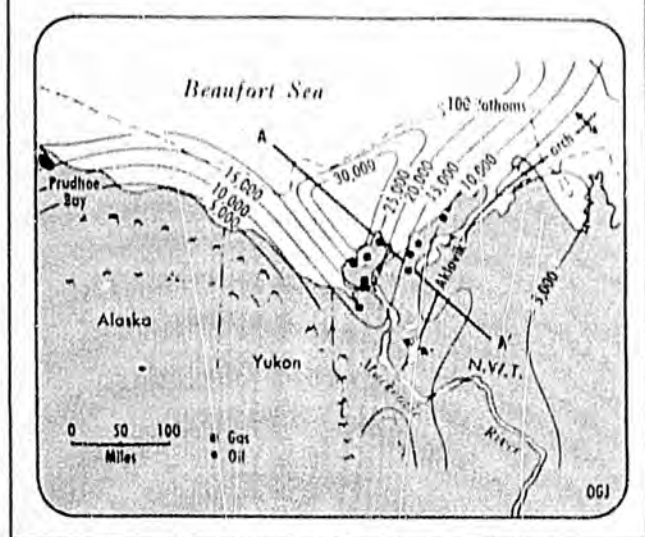
This subbasin is referred to as the Beaufort basin, and is similar in many respects to the highly petroliferous Western Gulf Coast basin, which has a proved oil yield of over 80,000 bbl/cu mile of sedimentary rock and a considerably higher potential.

The Beaufort basin is bounded on the southwest by mountain ranges and on the southeast by a basement high, referred to as the Aklavik arch (Fig. 2).

To the north the sediments thicken rapidly, reaching a maximum of about 30,000 ft. Little is known of the offshore section. Geophysical data reportedly indicate the presence of structures suggestive of diapirs (salt domes, Fig. 3). END PART 1 OF 2

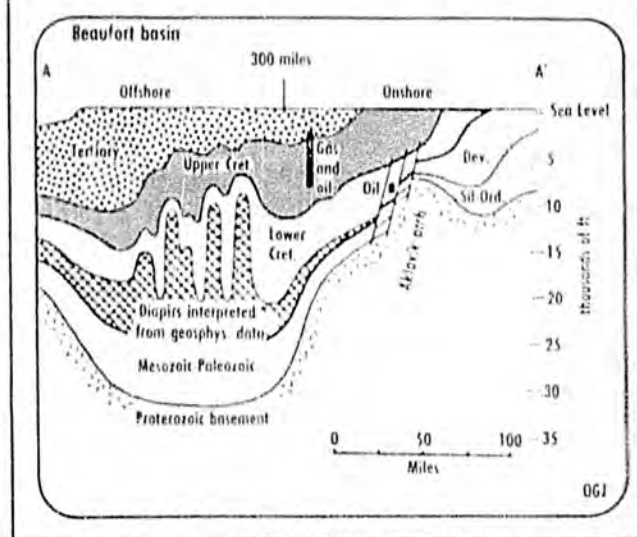
Beaufort basin

Fig. 2



Regional cross section

Fig. 3



Worldwide crude production

(Daily average in thousands of bbl)

	Nov. 1973	Oct.* 1973	Daily prod. 1972	Daily prod. 1973	10-month average Daily prod. 1973	Change from Vol. %
WESTERN HEMISPHERE						
Argentina	415.0	415.0	433.0	418.0	— 15.0	3.5
Bolivia	47.0	47.0	43.0	47.0	4.0	9.3
Brazil	170.0	169.0	165.0	169.0	4.0	2.4
Canada	1,831.0	1,812.0	1,516.0	1,793.0	277.0	18.3
Chile	31.0	31.0	34.0	32.0	— 2.0	— 5.9
Colombia	200.0	200.0	198.0	199.0	1.0	0.5
Ecuador	210.0	210.0	66.0	204.0	138.0	209.1
Mexico	480.0	480.0	441.0	464.0	23.0	5.2
Peru	74.0	73.4	67.0	69.0	2.0	3.0
Trinidad	165.0	160.0	141.0	164.0	23.0	16.3
United States	9,110.0	9,123.0	9,461.0	9,193.0	— 268.0	— 2.8
Venezuela	3,384.0	3,371.0	3,213.0	3,367.0	154.0	4.8
Total	16,117.0	16,091.4	15,778.0	16,119.0	341.0	2.2
WESTERN EUROPE						
Austria	48.0	48.0	47.0	49.0	2.0	4.3
Denmark	4.0	4.0	3.0	4.0	1.0	33.3
France	15.0	24.0	30.0	26.0	— 4.0	— 13.3
West Germany	126.0	126.4	138.0	130.0	— 8.0	— 5.8
Italy	15.0	15.0	22.0	15.0	— 7.0	— 31.8
Netherlands	26.2	27.0	27.0	29.0	2.0	6.5
Norway	38.0	38.0	34.0	36.0	2.0	5.9
Spain	20.0	20.0	3.0	15.0	12.0	400.0
United Kingdom	2.0	2.0	2.0	2.0	—	—
Yugoslavia	70.0	70.0	64.0	68.0	4.0	6.3
Total	374.2	374.4	370.0	374.0	4.0	1.8
MIDDLE EAST						
Abu Dhabi	1,155.0	1,340.0	1,041.0	1,326.0	285.0	27.4
Bahrain	68.7	68.1	70.0	68.0	— 2.0	— 2.9
Dubai	140.0	214.0	145.0	227.0	82.0	56.6
Iran	6,009.0	5,978.0	4,964.0	5,842.0	878.0	17.7
Iraq	1,923.0	1,797.0	1,423.0	1,947.0	524.0	36.8
Israel	—	20.0	107.0	92.0	— 15.0	— 14.0
Kuwait	2,615.0	3,058.4	3,303.0	3,070.0	— 233.0	— 7.1
Oman	300.0	304.0	282.0	292.0	10.0	3.5
Qatar	505.0	598.0	474.0	584.0	110.0	23.2
Saudi Arabia	6,269.4	7,797.9	5,956.0	7,699.0	1,743.0	29.3
Syria	—	20.0	119.0	104.0	— 15.0	— 12.6
Turkey	70.0	70.0	65.0	66.0	1.0	1.5
Total	19,055.1	21,265.4	17,949.0	21,317.0	3,368.0	18.8
ASIA-PACIFIC						
Afghanistan	—	—	—	—	—	—
Australia	433.0	414.0	331.0	419.0	88.0	26.6
Burma	23.0	23.0	23.0	23.0	—	—
Brunei-Malaysia	340.0	330.0	274.0	318.0	44.0	16.1
India	150.0	140.0	151.0	148.0	— 3.0	— 2.0
Indonesia	1,391.0	1,406.0	1,055.0	1,317.0	262.0	24.8
Japan	15.0	15.0	15.0	15.0	—	—
Pakistan	8.0	8.0	9.0	8.0	— 1.0	— 11.1
Taiwan	2.0	2.0	2.0	2.0	—	—
Thailand	0.2	0.2	0.2	0.2	—	—
Total	2,362.2	2,338.2	1,860.2	2,250.2	390.0	21.0
AFRICA						
Algeria	880.0	1,020.0	1,061.0	1,089.0	28.0	2.6
Angola	15.0	15.0	12.0	14.0	2.0	16.7
Cabinda	150.0	150.0	125.0	139.0	14.0	9.4
Congo	50.0	50.0	7.0	41.0	34.0	485.7
Egypt	30.0	60.0	214.0	177.0	— 37.0	— 17.3
Gabon	160.0	160.0	125.0	146.0	21.0	16.8
Libya	1,766.0	2,383.7	2,215.0	2,226.0	11.0	0.5
Morocco	0.3	0.3	0.3	0.3	—	—
Nigeria	2,200.0	2,190.4	1,809.0	2,031.0	222.0	12.3
Tunisia	83.0	83.0	83.0	83.0	—	—
Total	5,334.0	6,112.4	5,651.3	5,946.3	295.0	5.2
COMMUNIST						
China	700.0	700.0	600.0	690.0	90.0	15.0
Romania	275.0	275.0	275.0	275.0	—	—
U.S.S.R.	8,760.0	8,689.0	7,844.0	8,393.0	549.0	7.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
Total	9,845.0	9,774.0	8,819.0	9,468.0	649.0	7.4
WORLD TOTAL	53,087.0	55,955.8	50,427.5	55,474.5	5,047.0	10.0

*Figures adjusted

Worldwide gas production

	(Billion cu ft)		
	Nov. '73	Oct. '73	Cum. 1973
WESTERN HEMISPHERE			
Argentina	22.2	21.7	220.7
Bolivia	13.4	12.0	138.0
Brazil	3.5	2.9	43.9
Canada	266.6	259.7	2,964.7
Chile	12.8	19.7	226.3
Colombia	9.9	10.4	116.2
Ecuador	0.5	0.4	6.0
Mexico	55.8	52.8	626.1
Peru	6.6	6.7	58.8
Trinidad	12.1	11.2	126.3
United States	1,899.8	1,900.1	20,952.3
Venezuela	172.0	140.9	1,573.0
Total	2,475.2	2,438.5	27,052.3
WESTERN EUROPE			
Austria	4.6	6.7	65.4
Denmark	—	—	—
France	22.2	28.9	237.8
West Germany	61.2	50.4	540.3
Italy	38.6	46.7	436.7
Netherlands	140.1	200.7	2,389.0
Norway	—	—	—
Spain	—	—	—
United Kingdom	90.1	80.1	1,050.0
Yugoslavia	3.4	4.9	61.2
Total	360.2	408.4	4,780.4
MIDDLE EAST			
Abu Dhabi	—	—	—
Bahrain	1.2	1.0	19.3
Dubai	—	—	—
Iran	143.3	142.6	1,544.7
Iraq	12.0	11.7	144.1
Israel	0.1	0.1	3.0
Kuwait	0.1	0.2	50.4
Oman	—	—	—
Qatar	0.1	0.0	7.3
Saudi Arabia	—	—	—
Syria	—	—	—
Turkey	—	—	—
Total	156.8	155.6	1,768.8
ASIA-PACIFIC			
Afghanistan	—	—	—
Australia	13.3	3.9	76.7
Burma	12.5	16.0	134.1
Brunei-Malaysia	0.7	0.3	6.4
India	—	—	—
Indonesia	2.0	1.0	17.1
Japan	13.0	7.6	121.9
Pakistan	8.1	7.2	80.1
Taiwan	7.8	7.1	121.1
Thailand	2.1	2.0	26.7
Total	59.5	45.1	584.1
AFRICA			
Algeria	1.7	1.7	81.2
Angola	2.0	1.9	22.4
Cabinda	—	—	—
Congo	0.5	0.2	2.8
Egypt	3.2	2.7	28.7
Gabon	0.1	0.0	1.6
Libya	4.9	4.9	38.2
Morocco	1.9	1.7	35.5
Nigeria	4.2	4.2	55.9
Tunisia	4.6	4.1	16.2
Total	23.1	21.4	282.5
COMMUNIST			
China	12.8	13.0	146.1
Romania	77.4	110.4	1,192.2
U.S.S.R.	720.1	673.2	7,589.5
Other	27.6	60.9	570.2
Total	837.9	857.5	9,498.0
WORLD TOTAL	3,912.7	3,926.5	43,966.1

BOOKS

CRETACEOUS AND TERTIARY ROCKS OF THE SOUTHERN COLORADO PLATEAU. Edited by J. E. Fassett. Published as a Memoir of the Four Corners Geological Society, P.O. Box 1501, Durango, Colo. 81301. 218 p., 1973, \$14 hardbound.

This handsome volume contains 19 papers and six abstracts on the economic geology, stratigraphy, and paleontology of the Cretaceous and Tertiary of the Four Corners area. Included for the first time are separate

papers on the Dakota, Mesaverde, and Pictured Cliffs gas reservoirs of the San Juan basin authored by El Paso Natural Gas Co. geologists. Other papers deal with the economic potential of the Dakota sandstone in southwest Utah, the geology of the Project Wagon Wheel area, groundwater hydrology of the San Juan basin, and stratigraphic papers on the Dakota sandstone, the Gallup sandstone, and the Ojo Alamo sandstone. Included is a geologic road log from Durango to

west and southwest of Shiprock including detailed discussion of the Upper Cretaceous sands outcropping around the northwest rim of San Juan basin.

This book offers a valuable and timely update of the geology of the Upper Cretaceous and Tertiary of the Four Corners area.

NUMBER TWO, PITFALLS IN SEISMIC INTERPRETATION. By Paul M. Tucker, Howard J. Yorston. Published by SEG, Box 3098, Tulsa, Okla. 74101. 50 pp. \$2.50 to members, \$3 to nonmembers. \$2 orders of 50 or more per copy.

Many pitfalls in seismic interpretation are concealed in seemingly straightforward reflections. Some of these pitfalls are dug by nature and some are of our own doing. Many can be avoided. Pitfalls may be classified into three groups: those related to velocity, those related to the geometry of the reflectors, and those related to the recording, processing, and playback of the seismic data.

WATER ATLAS OF THE UNITED STATES. By James J. Geraghty et al. Published by Water Information Center, 44 Sintsink Drive East, Port Washington, N.Y. 11050. 1973. \$35. 200 pp.

This undated atlas gives 122 maps in color on almost any water subject. Completely new is a group of 33 maps devoted to the nation's water quality and pollution problems.

ENCYCLOPEDIA OF EXPLORATION GEOPHYSICS. By R. E. Sheriff. Published by SEG, Box 3098, Tulsa, Okla. 74101. 263 pp. 1973. \$10 clothbound to members, \$7 paperbound. \$12.50 to nonmembers cloth, \$9 paper.

This book contains 3,000 definitions of terms used in exploration geophysics, 203 illustrations, 12 tables, and 12 appendices.

ANADARKO BASIN EXPLORATION, OKLAHOMA. Compiled and edited by R. P. Brooks, Jr. Published by Petroleum Information, Box 1208, Dallas 75221 and Box 2612, Denver 80201. 1973. 246 pp.

The search for deep production in the Oklahoma part of the basin has been going on for several years. Recent discoveries have once again focused attention on the basin.

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Worldwide crude production

(Daily average in thousands of bbl)

	Sept. 1973	Aug.* 1973	Daily prod. 1972	9-month average Daily prod. 1973	Change from Vol.	%
WESTERN HEMISPHERE						
Argentina	410.0	410.0	429.0	417.0	-12.0	-2.8
Bolivia	45.0	45.0	42.0	47.0	5.0	11.9
Brazil	168.0	168.0	165.0	168.0	3.0	1.8
Canada	1,745.0	1,809.0	1,487.0	1,793.0	306.0	20.6
Chile	31.0	31.0	34.0	32.0	-2.0	-5.9
Colombia	190.0	190.0	200.0	192.0	-8.0	-4.0
Ecuador	210.0	210.0	35.0	202.0	167.0	477.1
Mexico	470.0	470.0	441.0	460.0	19.0	4.3
Peru	67.0	67.0	66.0	67.0	1.0	1.5
Trinidad	165.0	165.0	141.0	165.0	24.0	17.0
United States	9,149.0	9,173.0	9,459.0	9,220.0	-239.0	-2.5
Venezuela	3,395.0	3,385.0	3,207.0	3,363.0	156.0	4.9
Total	16,045.0	16,123.0	15,706.0	16,126.0	420.0	2.7
WESTERN EUROPE						
Austria	50.0	50.0	47.0	50.0	3.0	6.4
Denmark	4.0	4.0	3.0	4.0	1.0	33.3
France	27.0	27.0	31.0	27.0	-4.0	-12.9
West Germany	130.0	130.0	139.0	131.0	-8.0	-5.8
Italy	22.0	20.0	22.0	20.0	-2.0	-9.1
Netherlands	34.0	30.8	31.0	30.0	-1.0	-3.2
Norway	35.0	35.0	35.0	35.0		
Spain	23.0	23.0	3.0	20.0	17.0	566.7
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	70.0	70.0	63.0	71.0	8.0	12.7
Total	395.0	391.8	376.0	390.0	14.0	3.7
MIDDLE EAST						
Abu Dhabi	1,381.0	1,330.0	1,023.0	1,343.0	320.0	31.3
Bahrain	68.0	68.0	72.0	68.0	-4.0	-5.6
Dubai	273.0	293.0	132.0	238.0	106.0	80.3
Iran	5,793.0	5,702.0	4,879.0	5,808.0	929.0	19.0
Iraq	2,167.0	2,093.0	1,394.0	1,966.0	572.0	41.0
Israel	110.0	110.0	105.0	110.0	5.0	4.8
Kuwait	3,479.5	3,010.0	3,264.0	3,106.0	-158.0	-4.8
Oman	302.1	298.0	282.0	290.0	8.0	2.8
Qatar	608.3	568.0	454.0	591.0	137.0	30.2
Saudi Arabia	8,533.5	8,425.0	5,806.0	7,829.0	2,023.0	34.8
Syria	120.0	120.0	118.0	120.0	2.0	1.7
Turkey	65.0	65.0	65.0	65.0		
Total	22,900.4	22,082.0	17,594.0	21,534.0	3,940.0	22.4
ASIA-PACIFIC						
Afghanistan						
Australia	427.0	439.0	314.0	418.0	104.0	33.1
Burma	20.0	20.0	19.0	20.0	1.0	5.3
Brunei-Malaysia	330.0	330.0	270.0	320.0	50.0	18.5
India	150.0	150.0	151.0	150.0	-1.0	-0.7
Indonesia	1,350.0	1,355.0	1,033.0	1,295.0	262.0	25.4
Japan	15.0	15.0	15.0	15.0		
Pakistan	9.0	9.0	9.0	9.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,303.2	2,320.2	1,813.2	2,229.2	416.0	22.9
AFRICA						
Algeria	1,100.0	1,100.0	1,057.0	1,105.0	48.0	4.5
Angola	15.0	15.0	12.0	14.0	2.0	16.7
Cabinda	140.0	140.0	124.0	135.0	11.0	8.9
Congo	45.0	45.0	6.0	39.0	33.0	550.0
Egypt	235.0	235.0	216.0	212.0	-4.0	-1.9
Gabon	155.0	155.0	125.0	142.0	17.0	13.6
Libya	2,286.0	2,108.0	2,228.0	2,259.0	31.0	1.4
Morocco	0.3	0.3	0.3	0.3		
Nigeria	2,101.9	2,100.0	1,789.0	1,990.0	201.0	11.2
Tunisia	85.0	85.0	82.0	80.0	-2.0	-2.4
Total	6,163.2	5,983.3	5,679.3	5,976.3	337.0	6.0
Communist						
China	47,806.8	46,900.3	41,128.5	46,255.5	5,127.0	12.5
Romania	630.0	630.0	570.0	610.0	40.0	7.0
U.S.S.R.	275.0	275.0	275.0	275.0		
Other	8,663.0	8,454.0	7,845.0	8,316.0	471.0	6.0
Total	110.0	110.0	95.0	110.0	15.0	15.8
WORLD TOTAL	57,484.8	56,369.3	49,913.5	55,566.5	5,653.0	11.3

*Figures adjusted.

Gas production

(billions cu ft)

	Sept. *73	Aug. *73	Cum. 1973
WESTERN HEMISPHERE			
Argentina	23.6	20.0	176.8
Bolivia	12.1	14.2	112.6
Brazil	3.2	5.6	37.5
Canada	244.3	271.4	2,438.4
Chile	21.1	20.8	193.8
Colombia	9.5	12.6	95.9
Ecuador	0.5	0.6	5.1
Mexico	54.0	60.1	517.5
Peru	7.0	7.1	45.5
Trinidad	9.2	13.6	103.0
United States	1,811.9	1,870.3	17,152.4
Venezuela	141.1	140.2	1,260.1
Total	2,337.5	2,436.5	22,138.6
WESTERN EUROPE			
Austria	5.2	5.0	54.1
Denmark			
France	17.1	16.0	196.7
West Germany	46.2	41.7	428.7
Italy	42.1	40.6	351.4
Netherlands	193.9	249.2	2,048.2
Norway			
Spain			
United Kingdom	76.8	98.3	879.8
Yugoslavia	3.6	5.0	52.9
Total	384.9	455.8	4,011.8
MIDDLE EAST			
Abu Dhabi			
Bahrain	1.1	1.2	17.1
Dubai			
Iran	143.7	143.7	1,258.8
Iraq	12.7	14.1	120.4
Israel	0.1	0.1	2.8
Kuwait	0.2	0.4	50.1
Oman			
Qatar	0.1	0.1	7.2
Saudi Arabia			
Syria			
Turkey			
Total	157.9	163.2	1,456.4
ASIA-PACIFIC			
Afghanistan	4.1	4.2	59.5
Australia	14.2	14.4	105.6
Burma	0.4	0.6	5.4
Brunei-Malaysia			
India	1.1	1.2	14.1
Indonesia	8.9	9.8	101.3
Japan	6.1	6.7	64.8
Pakistan	8.2	9.4	106.2
Taiwan	1.9	2.3	22.6
Thailand			
Total	44.9	48.6	479.5
AFRICA			
Algeria	1.6	8.0	77.8
Angola	3.2	1.2	18.5
Cabinda			
Congo	0.4	0.6	2.1
Egypt	3.1	2.0	22.8
Gabon	0.1	0.1	1.5
Libya	6.2	3.0	28.4
Morocco	2.5	6.2	31.9
Nigeria	4.9	4.3	47.5
Tunisia	5.4	0.1	7.5
Total	27.4	25.5	238.0
Communist			
China	12.4	11.9	120.3
Romania	111.2	109.4	1,004.4
U.S.S.R.	653.1	701.2	6,142.2
Other	51.7	48.6	481.7
Total	828.4	871.1	7,748.6
WORLD TOTAL	3,781.0	4,090.7	36,072.9

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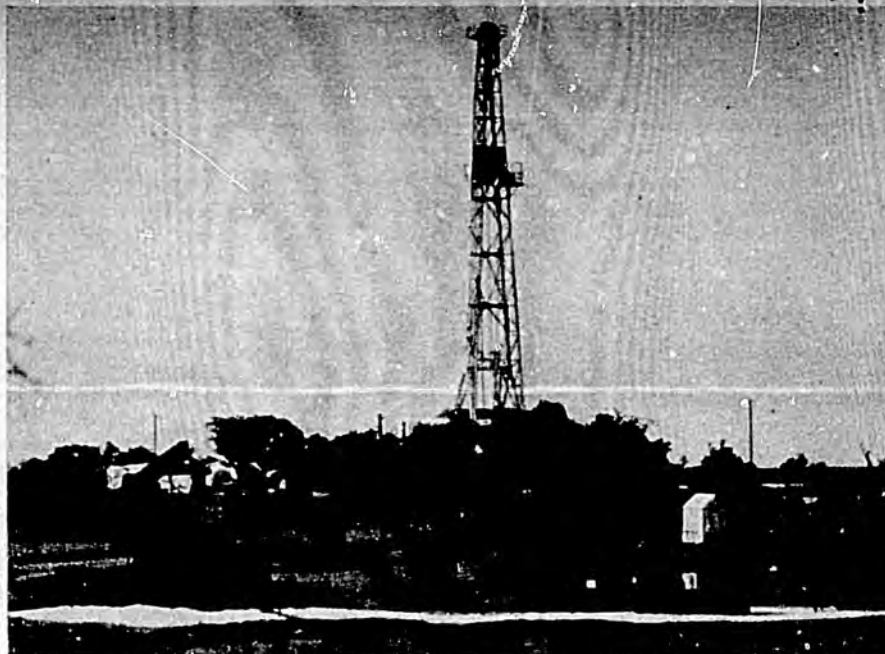
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EARLY oil giant enjoys revival.

Activity sparks pioneer oil field

ONE of oildom's oil giants, Sho-Vel-Tum field in southern Oklahoma, is enjoying a prolific revival with new drilling in new zones. Here Continental Oil Co. is drilling below 8,035 ft to a 14,000-ft Arbuckle Cambro-Ordovician objective at 1 Harris Fletcher "B" in NE SE SW 6-2s-3w. Location is in an old producing area south of the main field area, a field that covers a large section of southern Oklahoma. (Staff photo)

Springer sand hunt intensifies

SPRINGER sand exploration in Okla-
homa is picking up speed with new
successes and new plans announced.

Apexco Inc. is deep in the play with
completion reported at 1 Buell, C NW
11-11n-12w, northern Caddo County.
Location is 10 miles southwest of new
Springer production at North Niles
field in western Canadian County.
Open flow tests had 6,200 Mcfd from
perforations at 13,904 ft.

Other exploration news in the west-
ern part of Oklahoma includes a rank
wildcat in the only dry county in the
state. Woods Petroleum Co. will drill
to 5,000 ft at 1 Toler in C SW SE
14-1n-25w. Location is 40 miles from
Henderson pay production in Tillman
County. Well site is 6 miles north of
Red River in Harmon County.

Production is reported at a well in
Northwest Oakwood field, eastern
Dewey County. Wessely Energy 1
Blaine Unit, C NE NE 11-17n-15w, 2
miles southwest of Morrow Pennsyl-
vanian production, flowed gas and con-
densate on tests at 9,359-9,950 ft.

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Worldwide crude production

(Daily average in thousands of bbl)

	Aug. 1973	July* 1973	Daily prod. 1972	8-month average Daily prod. 1973	Change from Vol. %	
WESTERN HEMISPHERE						
Argentina	410.0	408.0	429.0	418.0	- 11.0	- 2.6
Bolivia	45.0	45.0	41.0	47.0	6.0	14.6
Brazil	168.0	168.0	165.0	168.0	3.0	1.8
Canada	1,794.0	1,813.0	1,483.0	1,794.0	311.0	21.0
Chile	31.0	31.0	34.0	32.0	- 2.0	- 5.9
Colombia	190.0	190.0	201.0	193.0	- 8.0	- 4.0
Ecuador	210.0	210.0	22.0	201.0	179.0	813.6
Mexico	475.0	470.0	441.0	459.0	18.0	4.1
Peru	67.0	67.0	66.0	67.0	1.0	1.5
Trinidad	165.0	165.0	140.0	165.0	25.0	17.9
United States	9,173.0	9,199.0	9,457.0	9,229.0	-228.0	- 2.4
Venezuela	3,385.0	3,380.0	3,194.0	3,359.0	165.0	5.2
Total	16,113.0	16,146.0	15,673.0	16,132.0	459.0	2.9
WESTERN EUROPE						
Austria	50.0	50.0	47.0	49.0	2.0	4.3
Denmark	4.0	4.0	2.0	4.0	2.0	100.0
France	27.0	27.0	31.0	27.0	- 4.0	-12.9
West Germany	130.0	130.0	139.0	131.0	- 8.0	- 5.8
Italy	20.0	20.0	22.0	20.0	- 2.0	- 9.1
Netherlands	36.0	27.4	31.0	30.0	- 1.0	- 3.2
Norway	35.0	34.7	35.0	35.0		
Spain	23.0	23.0	3.0	19.0	16.0	533.3
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	70.0	70.0	62.0	71.0	9.0	14.5
Total	397.0	388.1	374.0	388.0	14	3.7
MIDDLE EAST						
Abu Dhabi	1,350.0	1,367.6	1,001.0	1,345.0	344.0	34.4
Bahrain	68.0	68.0	72.0	68.0	- 4.0	- 5.6
Dubai	293.0	247.0	132.0	234.0	102.0	77.3
Iran	5,702.0	5,873.9	4,862.0	5,810.0	948.0	19.5
Iraq	2,093.0	2,083.1	1,383.0	1,942.0	559.0	40.4
Israel	100.0	100.0	100.0	100.0		
Kuwait	3,010.0	3,281.3	3,234.0	3,060.0	-174.0	- 5.4
Oman	298.0	298.0	282.0	288.0	6.0	2.1
Qatar	568.0	605.1	452.0	588.0	136.0	30.1
Saudi Arabia	8,425.0	8,684.1	5,731.0	7,742.0	2,011.0	35.1
Syria	120.0	120.0	117.0	120.0	3.0	2.6
Turkey	65.0	65.0	65.0	65.0		
Total	22,092.0	22,793.1	17,431.0	21,362.0	3,931.0	22.6
ASIA-PACIFIC						
Afghanistan						
Australia	445.0	445.0	303.0	417.0	114.0	37.6
Burma	20.0	20.0	19.0	20.0	1.0	5.3
Brunei-Malaysia	330.0	330.0	268.0	319.0	51.0	19.0
India	150.0	150.0	151.0	149.0	- 2.0	- 1.3
Indonesia	1,347.0	1,334.0	1,061.0	1,288.0	227.0	26.8
Japan	15.0	15.0	15.0	15.0		
Pakistan	9.0	9.0	9.0	9.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.2	0.2		
Total	2,318.2	2,305.2	1,783.2	2,219.2	436.0	24.5
AFRICA						
Algeria	1,100.0	1,100.0	1,055.0	1,106.0	51.0	4.8
Angolia	15.0	15.0	12.0	14.0	2.0	16.7
Cabinda	140.0	140.0	123.0	134.0	11.0	8.9
Congo	45.0	45.0	6.0	38.0	32.0	533.3
Egypt	235.0	235.0	216.0	209.0	- 7.0	- 3.2
Gabon	155.0	154.2	124.0	140.0	16.0	12.9
Libya	2,108.0	2,189.4	2,240.0	2,256.0	16.0	0.7
Morocco	0.3	0.3	0.3	0.3		
Nigeria	2,101.9	1,990.5	1,779.0	1,977.0	198.0	11.1
Tunisia	85.0	85.0	82.0	79.0	- 3.0	- 3.7
Total	5,985.2	5,954.4	5,637.3	5,953.3	316.0	5.6
COMMUNIST						
China	630.0	630.0	570.0	610.0	40.0	7.0
Romania	275.0	275.0	275.0	275.0		
U.S.S.R.	8,525.0	8,454.0	7,805.0	8,273.0	468.0	6.0
Other	105.0	105.0	90.0	105.0	15.0	16.7
Total	9,535.0	9,464.0	8,740.0	9,263.0	523.0	6.0
WORLD TOTAL	56,440.4	57,046.0	49,638.5	55,317.5	5,679.0	10.3

*Figures adjusted

Gas production

(billions cu ft)

	Aug.'73	July '73	Cum. 1973
WESTERN HEMISPHERE			
Argentina	20.0	19.8	153.2
Bolivia	14.2	12.8	100.5
Brazil	5.6	4.9	34.3
Canada	271.4	277.5	2,194.1
Chile	20.8	21.2	172.7
Colombia	12.6	13.0	86.4
Ecuador	0.6	0.7	4.6
Mexico	60.1	60.2	463.5
Peru	7.1	7.2	38.5
Trinidad	13.6	14.9	93.8
United States	1,870.3	1,871.2	15,340.5
Venezuela	140.2	139.3	1,119.0
Total	2,436.5	2,442.7	19,801.1
WESTERN EUROPE			
Austria	5.0	4.9	48.9
Denmark			
France	15.0	18.8	179.6
West Germany	41.7	48.7	382.5
Italy	40.6	39.4	309.3
Netherlands	249.2	251.1	1,854.3
Norway			
Spain			
United Kingdom	98.3	100.7	803.0
Yugoslavia	5.0	4.9	49.3
Total	455.8	468.5	3,626.9
MIDDLE EAST			
Abu Dhabi			
Bahrain	1.2	1.8	16.0
Dubai			
Iran	143.7	139.2	1,115.1
Iraq	14.1	14.2	107.7
Israel	0.1	0.1	2.7
Kuwait	0.4	4.3	49.9
Oman			
Qatar	0.1	1.1	7.1
Saudi Arabia			
Syria			
Turkey			
Total	163.2	160.7	1,298.5
ASIA-PACIFIC			
Afghanistan	4.2	6.4	55.4
Australia	14.4	11.9	91.4
Burma	0.6	0.7	5.0
Brunei-Malaysia			
India	1.2	1.1	13.0
Indonesia	9.8	10.9	92.4
Japan	6.7	7.9	58.7
Pakistan	9.4	10.3	98.0
Taiwan	2.3	1.8	20.7
Thailand			
Total	48.6	51.0	434.6
AFRICA			
Algeria	8.0	7.9	76.2
Angolia	1.2	1.6	15.3
Cabinda			
Congo	0.6	0.4	1.7
Egypt	2.0	1.9	19.7
Gabon	0.1	0.1	1.4
Libya	3.0	2.7	22.2
Morocco	6.2	6.2	29.4
Nigeria	4.3	4.8	42.6
Tunisia	0.1	0.1	2.1
Total	25.5	25.7	210.6
COMMUNIST			
China	11.9	11.2	107.9
Romania	109.4	111.7	893.2
U.S.S.R.	701.2	691.2	5,572.0
Other	43.6	50.6	430.0
Total	871.1	864.7	7,003.1
WORLD TOTAL	4,000.7	4,013.3	32,374.8

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Shell BP and Todd Oil Services Ltd.

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New Plymouth, New Zealand.
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3	IR	KVG-6	600
2	Clark	HRA-6	600
9	Clark	RA-6	600
3	Clark	RA-5	500
3	CB	GMV	600
10	Clark	RA-32	300
12	IR	XVG	300

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2	IR	HHE-6	4000
2	CB	LM-6	4000
2	CB	LM-4	3500
2	IR	HHE-6	3500
1	IR	HHE-3	2000

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- 1 — FRANKS ROCKET 658 D/D, w/FRANKS 96' derrick, mtd on FRANKS 4-axle carrier, CUMMINS 220 diesel.
- 1 — FRANKS EXPLORER 658, D/D, w/SKYTOP 96' hyd. derrick (2 yrs. old), mtd on FRANKS 4-axle, CUMMINS NHRS 320 diesel.
- 1 — FRANKS CRUISER 658 DTM, D/D, w/FRANKS derrick, mtd. on FRANKS 4-axle, CUMMINS NH 250.
- 2 — FRANKS EXPLORER 658 DTM, D/D, w/FRANKS 96' derrick, mtd. on FRANKS 4-axle, CUMMINS NH 250.
- 1 — HOPPER HOIST GXXA, D/D, w/HOPPER 96' hyd. mast 96-150-C (mast new 7-20-72) mtd. on HOPPER tandem, CUMMINS NH 220 diesel.
- 1 — FRANKS 44, D/D, w/65' single pole mast, mtd. on IHC, IHC 501RD gas engine.
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AGO 530016

Worldwide crude production

	July 1973	June* 1973	Daily prod. 1972	Daily prod. 1973	7-month average Change Vol.	from %
WESTERN HEMISPHERE						
Argentina	418.0	418.0	430.0	421.0	- 9.0	- 2.1
Bolivia	50.0	50.0	40.0	50.0	10.0	25.0
Brazil	168.0	168.0	165.0	168.0	3.0	1.8
Canada	1,813.0	1,725.0	1,472.0	1,799.0	327.0	22.2
Chile	35.0	35.0	35.0	35.0		
Colombia	200.0	200.0	201.0	200.0	- 1.0	- 0.5
Ecuador	210.0	192.5	16.0	198.0	182.0	
Mexico	470.0	460.0	442.0	457.0	15.0	3.4
Peru	70.0	70.0	65.0	70.0	5.0	7.7
Trinidad	165.0	165.0	139.0	165.0	26.0	18.7
Venezuela	3,380.0	3,417.4	3,182.0	3,355.0	173.0	5.4
TOTAL	6,979.0	6,900.9	6,187.0	6,918.0	731.0	11.8
EUROPE						
Austria	48.0	47.0	46.0	47.0	1.0	2.2
Denmark	4.0	4.0	1.0	4.0	3.0	300.0
France	27.0	27.0	32.0	27.0	- 5.0	- 15.6
West Germany	130.0	130.5	140.0	131.0	- 9.0	- 6.4
Italy	20.0	20.0	22.0	19.0	- 3.0	- 13.6
Netherlands	27.4	30.0	32.0	29.0	- 3.0	- 9.4
Norway	35.7	40.0	34.0	36.0	2.0	5.9
Spain	23.0	23.0	3.0	19.0	16.0	533.3
United Kingdom	2.0	2.0	2.0	2.0		
Yugoslavia	70.0	70.0	61.0	71.0	10.0	16.4
TOTAL	387.1	393.6	373.0	385.0	2.0	3.2
MIDDLE EAST						
Abu Dhabi	1,367.6	1,328.0	981.0	1,344.0	363.0	37.0
Bahrain	68.3	68.7	72.0	68.0	- 4.0	- 5.6
Dubai	247.0	210.0	132.0	225.0	93.0	70.5
Iran	5,873.9	5,797.0	4,845.0	5,826.0	981.0	20.2
Iraq	2,083.1	2,020.0	1,398.0	1,919.0	521.0	37.3
Israel	100.0	100.0	110.0	100.0	- 10.0	- 9.0
Kuwait	3,289.1	2,821.5	3,177.0	3,069.0	- 108.0	- 3.4
Oman	298.0	286.0	281.0	287.0	6.0	2.1
Qatar	705.1	560.0	441.0	606.0	165.0	37.4
Saudi Arabia	8,691.9	7,521.3	5,949.0	7,644.0	1,995.0	35.3
Syria	120.0	120.0	117.0	120.0	3.0	2.6
Turkey	64.0	64.0	64.0	64.0		
TOTAL	22,908.0	20,896.5	17,267.0	21,272.0	4,005.0	23.2
ASIA-PACIFIC						
Afghanistan						
Australia	445.0	436.0	292.0	413.0	121.0	41.4
Burma	20.0	20.0	18.0	20.0	2.0	11.1
Brunei-Malaysia	330.0	320.0	264.0	317.0	53.0	20.1
India	150.0	150.0	151.0	149.0	- 2.0	- 1.3
Indonesia	1,253.0	1,275.3	998.0	1,220.0	222.0	22.2
Japan	15.0	15.0	15.0	15.0		
Pakistan	9.0	9.0	9.0	9.0		
Taiwan	2.0	2.0	2.0	2.0		
Thailand	0.2	0.2	0.3	0.2	- 0.1	- 33.3
TOTAL	2,224.2	2,227.5	1,749.3	2,145.2	395.9	22.6
AFRICA						
Algeria	1,100.0	1,100.0	1,051.0	1,107.0	56.0	5.3
Angola	15.0	13.0	12.0	14.0	2.0	16.7
Cabinda	140.0	132.0	122.0	133.0	11.0	9.0
Congo (Brazzaville)	47.0	47.0	6.0	38.0	32.0	533.3
Egypt	235.0	177.0	216.0	205.0	- 11.0	- 5.1
Gabon	150.0	150.0	124.0	138.0	14.0	11.3
Libya	2,189.4	2,289.0	2,261.0	2,277.0	16.0	0.7
Morocco	0.3	0.3	0.3	0.3		
Nigeria	2,000.0	1,999.0	1,764.0	1,957.0	193.0	10.9
Tunisia	85.0	85.0	81.0	79.0	- 2.0	- 2.5
TOTAL	5,961.7	5,992.3	5,637.3	5,948.3	311.0	5.5
NONCOMMUNIST						
United States	38,460.0	36,410.8	31,213.6	36,668.5	5,454.9	17.5
TOTAL	47,659.0	45,624.8	40,662.6	45,906.5	5,243.9	12.9
COMMUNIST AREA						
China	600.0	600.0	550.0	600.0	50.0	9.1
Romania	275.0	275.0	275.0	275.0		
Russia	8,454.0	8,371.0	7,764.0	8,230.0	466.0	6.0
Other	105.0	105.0	105.0	105.0		
TOTAL	9,434.0	9,351.0	8,694.0	9,210.0	516.0	5.9
WORLD TOTAL	57,093.0	54,975.8	49,356.6	55,116.5	5,759.9	11.7

*Figures Adjusted.

Worldwide gas production

July '73	(Billions cu ft) June '73	1973 cum.
19.8	20.2	133.2
12.8	13.6	86.3
4.9	6.2	28.7
277.5	252.7	1,922.7
21.2	24.0	151.9
13.0	12.8	73.8
0.7	0.8	4.0
60.2	60.1	403.4
7.2	6.1	31.4
14.9	13.6	80.2
139.3	140.2	978.8
571.5	550.1	3,894.4
4.9	6.2	43.9
18.8	18.1	163.6
48.7	50.2	340.8
39.4	40.0	268.7
251.1	246.2	1,605.1
100.7	101.7	704.7
4.9	6.0	44.3
468.5	468.4	3,171.1
1.8	2.1	14.8
139.2	142.7	971.4
14.2	15.1	93.6
0.1	0.2	2.6
4.3	5.0	45.9
1.1	1.0	7.0
160.7	166.1	1,135.3
6.4	6.7	51.2
11.9	12.5	77.0
0.7	0.6	4.4
1.1	1.0	11.8
10.9	11.0	82.6
7.9	7.6	52.0
10.3	11.0	88.6
1.8	2.0	18.4
51.0	52.4	386.0
7.9	8.0	68.2
1.6	1.7	14.1
0.4	0.1	1.1
1.9	2.0	17.7
0.1	0.1	1.3
2.7	2.4	19.2
6.2	2.0	23.2
4.8	5.6	38.3
0.1	0.2	2.0
25.7	22.1	185.1
1,277.4	1,259.1	8,771.9
1,871.2	1,889.3	13,470.2
3,148.6	3,148.4	22,242.1
11.2	12.0	96.0
111.7	110.9	783.8
691.2	688.4	4,870.8
50.6	49.9	381.4
864.7	861.2	6,132.0
4,013.3	4,009.6	28,374.1

BOOKS

OIL AND GAS INTERNATIONAL YEAR BOOK. Published by Walter R. Skinner, 388-389 10 Bolt Court, London EC4A 3HL, England. 1973. Post paid 8 pounds or \$24. Via air 11 pounds or \$33. 812 pp.

The 1973 edition of Skinner's Oil & Gas International Year Book (formerly Oil & Petroleum International Year Book) contains particulars of over 1,200 companies including a number of new companies in the gas industry. The book is recognized as the fore-

most reference work of its kind, with a coverage both worldwide and detailed. The many companies registered abroad are distinguished by an entry immediately beneath the title giving the date and place of incorporation; where the date of registration alone is mentioned, the company is registered in the United Kingdom.

Again, each company entry has been reviewed and, where necessary, revised in the light of additional information received since the previous

volume. The information thus recorded is the latest available at the time of going to press.

This edition has been considerably enlarged with new features: (a) North Sea section showing map with major discoveries together with extensive list of U.K. concession participants, (b) a cross-reference Index to the titles of nearly 3,500 oil, gas and associate companies appearing in this volume, (c) refining, tanker and consumption tables. Established features—"Geographical Index," "Suppliers' Directory and Buyers' Guide," "World Production Table," "Professional Services," and "Australian Oil Map" have been retained and updated.

MINERAL EXPLORATION, MINING, AND PROCESSING PATENTS, 1972. By Oliver S. North. 812 South Ode St., Arlington, Va. 22204. 319 pp. 1937. \$25.

This subject-classified, fully indexed volume of abstracts of the 1972 patent literature is of both immediate and long-term reference value to executives, research and planning engineers, and all professional personnel charged with responsibility in one or more of the following areas: exploring for metallic and nonmetallic minerals, mining mineral deposits, beneficiating ores and concentrating minerals, extracting metals from ores, refining primary metals, and supplying reagents and equipment to the minerals industry.

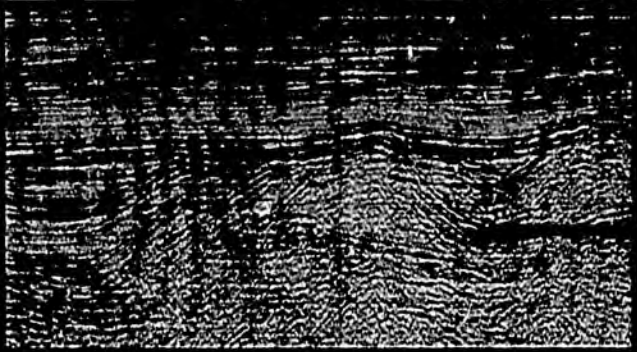
EUROPEAN MODEL CODE OF SAFE PRACTICE IN THE STORAGE AND HANDLING OF PETROLEUM PRODUCTS. PART I: OPERATIONS. Published by Applied Science Publishers Ltd., 22 Rippleside Commercial Estate, Barking, Essex, England. 1973. 84 pp.

SAND AND SANDSTONE. By Pettijohn-Potter-Siever, Published by Springer-Verlag, 175 Fifth Avenue, New York 10010. 1973. 615 pp. \$14.50.

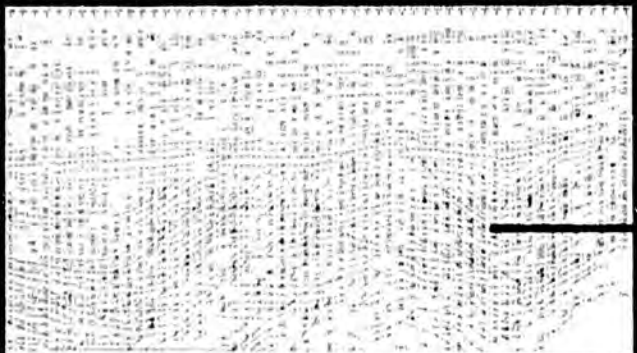
This book is the outgrowth of a week-long conference on sandstone organized by the authors in Banff, 1964 under the auspices of the Alberta Association of Petroleum Geologists and the University of Alberta. It was again held in 1965 in Bloomington, Ind., at the University of Indiana. A 200-page syllabus was prepared for the second conference.

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digicon inc.

Worldwide crude production

(Daily average in thousands of bbl)

	June 1973	May* 1973	Daily prod. 1972	6-month average Daily prod. 1973	Change from Vol. %	
WESTERN HEMISPHERE						
Argentina	422.0	422.0	430.0	432.0	2.0	0.5
Bolivia	50.0	50.0	40.0	50.0	10.0	25.0
Brazil	165.0	165.0	168.0	165.0	- 3.0	- 1.8
Canada	1,900.3	1,731.0	1,461.0	1,809.0	348.0	23.8
Chile	35.0	35.0	32.0	35.0	3.0	9.4
Colombia	200.0	200.0	202.0	200.0	- 2.0	- 1.0
Ecuador	192.5	150.0	7.0	197.0	190.0	...
Mexico	475.0	475.0	442.0	468.0	26.0	5.9
Peru	70.0	70.0	66.0	70.0	4.0	6.1
Trinidad	165.0	165.0	141.0	165.0	24.0	17.0
Venezuela	3,373.0	3,415.0	3,166.0	3,338.0	172.0	5.4
TOTAL	7,047.8	6,878.0	6,155.0	6,929.0	774.0	12.6
EUROPE						
Austria	47.0	47.0	46.0	47.0	1.0	2.2
Denmark	4.0	4.0	...	4.0	4.0	...
France	30.0	30.0	32.0	30.0	- 2.0	- 6.3
West Germany	130.0	129.7	140.0	131.0	- 9.0	- 6.4
Italy	20.0	20.0	22.0	20.0	- 2.0	- 9.1
Netherlands	30.0	30.0	32.0	30.0	- 2.0	- 6.3
Norway	40.0	38.6	33.0	36.0	3.0	9.1
Spain	23.0	23.0	3.0	18.0	15.0	500.0
United Kingdom	2.0	2.0	2.0	2.0	...	...
Yugoslavia	70.0	70.0	60.0	70.0	10.0	16.7
TOTAL	396.0	394.3	370.0	388.0	18.0	4.9
MIDDLE EAST						
Abu Dhabi	1,298.0	1,384.0	984.0	1,335.0	351.0	35.7
Bahrain	68.7	68.4	73.0	68.0	- 5.0	- 6.8
Dubai	210.0	239.0	129.0	222.0	93.0	72.1
Iran	5,827.0	5,843.0	4,829.0	5,823.0	994.0	20.6
Iraq	2,020.0	2,046.0	1,475.0	1,891.0	416.0	28.2
Israel	110.0	110.0	120.0	110.0	- 10.0	- 8.3
Kuwait	2,855.0	2,825.0	3,239.0	3,036.0	- 203.0	- 6.3
Oman	286.0	288.0	279.0	285.0	6.0	2.2
Qatar	560.0	586.0	435.0	589.0	154.0	35.4
Saudi Arabia	7,554.8	8,318.0	5,686.0	7,470.0	1,784.0	31.4
Syria	120.0	120.0	118.0	120.0	2.0	1.7
Turkey	70.0	70.0	64.0	69.0	5.0	7.8
TOTAL	20,979.5	21,897.4	17,431.0	21,018.0	3,587.0	20.6
ASIA-PACIFIC						
Afghanistan	...	...	...	...	...	...
Australia	436.6	431.0	322.0	408.0	86.0	26.7
Burma	20.0	20.0	18.0	20.0	2.0	11.1
Brunei-Malaysia	320.0	320.0	278.0	315.0	37.0	13.3
India	150.0	150.0	152.0	150.0	- 2.0	- 1.3
Indonesia	1,350.0	1,325.0	1,029.0	1,235.0	206.0	20.0
Japan	15.0	15.0	15.0	15.0	...	...
Pakistan	9.0	9.0	9.0	9.0	...	...
Taiwan	2.0	2.0	2.0	2.0	...	...
Thailand	0.3	0.3	0.3	0.3	...	...
TOTAL	2,302.9	2,272.3	1,825.3	2,154.3	329.0	18.0
AFRICA						
Algeria	1,110.0	1,110.0	1,044.0	1,108.0	64.0	6.1
Angola	13.0	13.0	12.0	13.0	1.0	8.3
Cabinda	132.0	132.0	124.0	132.0	8.0	6.5
Congo (Brazzaville)	48.0	47.1	8.0	36.8	28.8	360.0
Egypt	210.0	216.0	218.0	200.0	- 18.0	- 8.3
Gabon	148.0	147.7	130.0	135.2	5.2	0.4
Libya	2,289.0	2,264.0	2,301.0	2,292.0	- 9.0	- 0.4
Morocco	0.3	0.3	0.3	0.3	...	...
Nigeria	1,998.0	1,948.4	1,759.0	1,941.0	182.0	10.3
Tunisia	85.0	85.0	80.0	85.0	5.0	6.3
TOTAL	6,033.3	5,963.5	5,676.3	5,943.3	267.0	4.7
NONCOMMUNIST						
United States	36,759.5	37,405.5	31,457.6	36,432.6	4,975.0	15.8
	9,206.0	9,216.0	9,437.0	9,242.0	- 195.0	- 2.1
TOTAL	45,965.5	46,621.5	40,894.6	45,674.6	4,780.0	11.7
COMMUNIST AREA						
China	600.0	600.0	550.0	600.0	50.0	9.1
Romania	275.0	275.0	275.0	275.0	...	...
Russia	8,371.0	8,289.0	7,795.0	8,187.0	392.0	5.0
Other	105.0	105.0	105.0	105.0	...	...
TOTAL	9,351.0	9,269.0	8,725.0	9,167.0	442.0	5.1
WORLD TOTAL	55,316.5	55,890.5	49,619.6	54,841.6	5,222.0	10.5

*Figures adjusted. †On stream July 1972.

Worldwide gas production

(Billions cu ft)

	June '73	May '73	1973 cum.
...	20.2	19.2	113.4
...	13.6	12.4	73.5
...	6.2	4.1	23.8
...	252.7	267.4	1,645.2
...	24.0	20.7	130.7
...	12.8	11.1	60.8
...	0.8	0.5	3.3
...	60.1	54.4	343.2
...	6.1	4.0	24.2
...	13.6	12.1	65.3
...	140.0	138.7	839.5
TOTAL	550.1	544.6	3,322.9
...	6.2	7.8	39.0
...	18.1	20.0	144.8
...	50.2	56.0	292.1
...	40.0	41.9	229.3
...	246.2	246.1	1,354.0
...	...	...	...
...	101.7	100.7	604.0
...	6.0	7.9	39.4
TOTAL	468.4	480.4	2,702.6
...	2.1	3.0	13.0
...	142.7	141.2	832.2
...	15.1	16.1	79.4
...	0.2	0.4	2.5
...	5.0	6.1	41.6
...	1.0	1.1	5.9
...	...	...	...
TOTAL	166.1	167.9	974.6
...	6.7	7.5	44.8
...	12.5	11.4	65.1
...	0.6	0.7	3.7
...	1.0	1.1	10.7
...	11.0	11.9	71.7
...	7.6	7.8	44.1
...	11.0	12.4	78.3
...	2.0	2.8	16.6
TOTAL	52.4	55.6	335.0
...	8.0	8.7	60.3
...	1.7	1.9	12.5
...	0.1	0.2	0.7
...	2.0	2.1	15.8
...	0.1	0.1	1.2
...	2.4	2.9	16.5
...	2.0	2.4	17.0
...	5.6	5.7	33.5
...	0.2	0.3	1.9
TOTAL	22.1	24.3	159.4
...	1,259.1	1,272.8	7,494.5
...	1,889.3	1,910.4	11,599.0
TOTAL	3,148.4	3,183.2	19,093.5
...	12.0	12.9	84.8
...	110.9	111.1	672.1
...	688.4	688.3	4,179.6
...	49.9	59.8	330.8
TOTAL	861.2	872.1	5,267.3
WORLD TOTAL	4,009.6	4,055.3	24,360.8

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LEGAL

U.S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Montana State Office, 316 North 26th Street, Billings, Montana 59101. Notice is hereby given that approximately 1557.51 acres of land in eight (8) parcels within the known geologic structures of DRY CREEK, BELFRY, and CLARK'S FORK NORTH Fields, situated in Carbon County, MONTANA, will be offered for competitive oil and gas leasing through sealed bids to the qualified bidder of the highest cash amount per acre at 10:00 a.m., M.D.T., September 18, 1973, with the bids being opened at 1:00 p.m., M.D.T., September 18, 1973. Special environmental stipulations will be required on all of the parcels. Full details of the lease offering,

International Nickel Company, Inc., The	44, 45
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Sumitomo Shipbuilding & Machinery Co., Ltd.	79
Swaco Operations, Oilfield Products Division, Dresser Industries, Inc.	27
Turbo Power & Marine Systems, Subsidiary of United Aircraft Corp.	31
Western Hemisphere, Ltd.	6
Youngstown Sheet & Tube Company	5

and how and where to submit bids, may be obtained from the Bureau of Land Management, 316 North 26th Street, Billings, Montana 59101.

LEGAL

SEALED BIDS will be received until 2:00 p.m., M.D.T., September 19, 1973, and opened at that time in the Colorado State Office, for competitive oil and gas leasing of 2,166.08 acres of land in eleven parcels within the known geologic structures of the Douglas Creek-Dragon Trail, White River Dome, and Wilson Creek Fields, Rio Blanco County, Colorado. The United States reserves the right to reject any and all bids. Lease offering and bid information may be obtained from the Bureau of Land Management, Room 700, Colorado State Bank Building, 1600 Broadway, Denver, Colorado 80202.

(Continued from p. 95)

east of State Line field and about 2 miles east-northeast of the above discovery. State Line was a 1972 discovery. Harding County lies in northwestern South Dakota on the southern rim of the huge basin.

TEXAS

ATHENS Devonian field in Reeves County, West Texas, has its second well.

New producer is Getty Oil Co. 1 State "28," 10 miles north of Toyah. The Delaware basin success flowed 81,000 Mcfd on calculated absolute open flow from perforations at 12,729-12,991 ft. Total depth is 13,500 ft. Location is in Section 28, Block 55, T-5, T&P Survey, 1/2 mile northwest of the field-opener, a well dug by Coastal States Gas Producing Co. at 1 Jean Spencer trust.

ELLENBURGER gas is reported at a Pecos County wildcat in West Texas.

New strike is Coastal States Gas Producing Co. 1 C. R. Downie, 35 miles south of Fort Stockton in the Delaware basin. Flow was 18,500 Mcfd on calculated absolute open flow through perforations at 21,300-22,268 ft. Location is in Sec. 7, Block R-3, GC&SF Survey. It is 3 1/2 miles south of Grey Ranch field, a Devonian and Ellenburger pool.

DUAL Fusselman and Ellenburger gas production is reported at a new wildcat discovery in West Texas' Loving County.

Forest Oil Corp. completed the dual well at 1 El Paso-State, 4 miles southeast of Mentone, county seat. The well flowed 32,000 Mcfd on calculated absolute open flow, from perforations at 18,804-19,119 ft in the Fusselman Siluro-Devonian and 9,400 Mcfd from Ellenburger Cambro-Ordovician section at 21,298-21,479 ft. Location is in Section 54, Block 1, W&NW Survey.

DAVIDSON Ranch field in Crockett County, West Texas, has been extended to the east.

Extension success is Delta-Suburban of San Antonio 1-D McMullan, 3/4 mile to the east of field production. The well flowed 1,075 Mcfd from perforations in the Pennsylvanian at 7,827 to 8,048 ft.

GAS ENGINEERS

(Overseas)

Several Gas Engineers required for initial assignment in the Hague and subsequent transfer to Saudi Arabia. Degree in Chemical Engineering and 5-10 years in process design, facilities planning and technical service of gas processing plants and LNG plants. Knowledgeable in metallurgical problems experienced in gas processing facilities. Should have supervisory background and growth potential. Will also consider for junior positions recent graduates whose studies include gas engineering or who have had limited experience in this field.

Good schools, hospitals, community and recreational facilities similar to any small community in the U.S.A. All inclusive benefits plan. Opportunities for substantial savings and extensive travel due to liberal vacations.

Send résumé outlining education, work experience and personal history to:



EMPLOYMENT SUPERVISOR

ARABIAN AMERICAN OIL COMPANY

1345 Avenue of the Americas, New York, N.Y. 10019

an equal opportunity employer

Worldwide crude production

	Jan. 1973	Dec. 1972	(Daily average in thousands of bbl)			
			12-month average		Change from	
			Daily prod. 1972	Daily prod. 1973	Vol.	%
WESTERN HEMISPHERE						
Argentina	431.0	452.0	442.0	431.0	- 11.0	- 2.5
Bolivia	45.0	45.0	39.0	45.0	6.0	15.4
Brazil	165.0	165.0	169.0	165.0	- 4.0	- 2.4
Canada	1,788.0	1,726.0	1,579.0	1,788.0	209.0	13.2
Chile	35.0	34.0	32.0	35.0	3.0	9.4
Colombia	200.0	195.0	208.0	200.0	- 8.0	- 3.8
Ecuador	140.0	170.0	3.0	140.0	137.0	...
Mexico	460.0	450.0	439.0	460.0	21.0	4.8
Peru	70.0	70.0	62.0	70.0	8.0	12.9
Trinidad	165.0	160.0	125.0	165.0	40.0	32.0
Venezuela	3,262.0	3,284.0	3,169.0	3,262.0	93.0	2.9
TOTAL	6,761.0	6,751.0	6,267.0	6,761.0	494.0	7.9
EUROPE						
Austria	47.0	46.0	49.0	47.0	- 2.0	- 4.1
Denmark	4.0	6.0	...	4.0	4.0	...
France	30.0	30.0	34.0	30.0	- 4.0	- 11.8
West Germany	130.0	137.0	139.0	130.0	- 9.0	- 6.5
Italy	20.0	20.0	24.0	20.0	- 4.0	- 16.7
Netherlands	33.0	30.8	33.0	33.0	...	...
Norway	38.0	23.8	10.0	38.0	28.0	280.0
Spain	2.5	2.5	2.5	2.5	...	...
United Kingdom	1.6	1.6	1.6	1.6	...	...
Yugoslavia	70.0	69.0	58.0	70.0	12.0	20.7
TOTAL	376.1	367.1	351.1	376.1	25.0	7.1
MIDDLE EAST						
Abu Dhabi	1,255.0	1,142.0	1,048.0	1,255.0	207.0	19.8
Bahrain	68.0	67.3	74.0	68.0	- 6.0	- 8.1
Dubai	240.0	240.3	130.0	240.0	110.0	84.6
Iran	5,809.0	5,643.0	4,706.0	5,809.0	1,103.0	23.4
Iraq	1,487.0	1,699.0	1,930.0	1,487.0	-443.0	- 23.0
Israel	120.0	120.0	120.0	120.0	...	...
Kuwait	3,765.0	3,090.2	3,772.0	3,765.0	- 7.0	- 0.2
Oman	280.0	281.0	280.0	280.0	...	...
Qatar	581.0	575.0	452.0	581.0	129.0	28.5
Saudi Arabia	5,878.0	6,699.1	4,621.0	5,878.0	1,257.0	22.4
Syria	120.0	120.0	115.0	120.0	5.0	4.3
Turkey	67.0	67.0	61.0	67.0	6.0	9.8
TOTAL	19,670.0	19,743.3	17,309.0	19,670.0	2,361.0	13.6
ASIA-PACIFIC						
Australia	413.0	439.2	361.0	413.0	52.0	14.4
Burma	20.0	20.0	18.0	20.0	2.0	11.1
Brunei-Malaysia	320.0	310.0	265.0	320.0	55.0	20.8
India	150.0	150.0	152.0	150.0	- 2.0	- 1.3
Indonesia	1,124.0	1,121.0	933.0	1,124.0	191.0	20.5
Japan	15.0	15.0	15.0	15.0	...	...
Pakistan	9.0	9.0	9.0	9.0	...	...
Taiwan	2.0	2.0	2.0	2.0	...	...
Thailand	0.3	0.3	0.3	0.3	...	...
TOTAL	2,053.3	2,066.5	1,755.3	2,053.3	298.0	17.0
AFRICA						
Algeria	1,100.0	1,100.0	951.0	1,100.0	149.0	15.7
Angola	13.0	12.5	12.0	13.0	1.0	8.3
Cabinda	130.0	130.0	124.0	130.0	6.0	4.8
Congo (Brazzaville)	7.5	7.5	0.5	7.5	7.0	...
Egypt	202.0	202.0	227.0	202.0	- 25.0	- 11.0
Gabon	140.0	140.0	129.0	140.0	11.0	8.5
Libya	2,306.0	2,215.0	2,455.0	2,306.0	-149.0	- 6.1
Morocco	0.3	0.3	0.3	0.3	...	...
Nigeria	1,932.0	1,920.0	1,695.0	1,932.0	237.0	14.0
Tunisia	85.0	85.0	82.0	85.0	3.0	3.7
TOTAL	5,915.8	5,812.3	5,675.8	5,915.8	240.0	4.2
Non-Communist	34,776.2	34,740.2	31,258.2	34,776.2	3,418.0	10.9
United States	9,465.0	9,485.0	9,115.0	9,465.0	350.0	3.8
TOTAL	44,241.2	44,225.2	40,473.2	44,241.2	3,768.0	9.3
COMMUNIST AREA						
Red China	600.0	600.0	510.0	600.0	90.0	17.6
Romania	280.0	280.0	280.0	280.0	...	...
Russia	8,077.0	8,006.0	7,620.0	8,077.0	457.0	6.0
Other	85.0	85.0	85.0	85.0	...	...
TOTAL	9,042.0	8,971.0	8,495.0	9,042.0	547.0	6.4
WORLD TOTAL	53,283.2	53,196.2	48,968.2	53,283.2	4,315.0	8.8

*Figures adjusted. †On stream July '72.

Worldwide gas production

	(billions of cu ft)		
	Jan. '73	Dec. '72	1973 total
WESTERN HEMISPHERE			
Argentina	18.9	19.8	18.9
Bolivia	14.0	14.0	14.0
Brazil	3.2	3.6	3.2
Canada	281.6	265.9	281.6
Chile	21.0	23.0	21.0
Colombia	9.2	10.3	9.2
Ecuador	0.3	0.4	0.3
Mexico	60.2	55.8	60.2
Peru	0.1	0.2	0.1
Trinidad	10.1	9.3	10.1
Venezuela	142.0	140.0	142.0
TOTAL	560.6	542.3	560.6
EUROPE			
Austria	6.0	7.1	6.0
Denmark	20.2	21.3	20.2
France	56.0	53.0	56.0
West Germany	46.0	38.7	46.0
Italy	123.0	120.0	123.0
Netherlands	...	...	...
Norway	...	...	...
Spain	87.1	64.2	87.1
United Kingdom	4.2	5.0	4.2
Yugoslavia	...	...	...
TOTAL	342.5	309.3	342.5
MIDDLE EAST			
Abu Dhabi	0.3	0.3	0.3
Bahrain	137.9	128.5	137.9
Dubai	0.0	0.1	0.0
Iran	0.5	0.5	0.5
Iraq	14.1	16.0	14.1
Israel	...	...	...
Kuwait	0.2	0.1	0.2
Oman	...	...	...
Qatar	...	...	...
Saudi Arabia	...	...	...
Syria	...	...	...
Turkey	...	...	...
TOTAL	153.0	129.3	153.0
ASIA-PACIFIC			
Australia	7.8	7.7	7.8
Burma	10.1	9.9	10.1
Brunei-Malaysia	0.6	0.6	0.6
India	...	...	...
Indonesia	1.4	1.4	1.4
Japan	12.4	12.7	12.4
Pakistan	6.7	6.7	6.7
Taiwan	13.9	12.4	13.9
Thailand	3.0	2.9	3.0
TOTAL	55.9	54.3	55.9
AFRICA			
Algeria	9.3	10.4	9.3
Angola	3.0	3.2	3.0
Cabinda	...	...	...
Congo (Brazzaville)	0.1	0.1	0.1
Egypt	5.2	4.8	5.2
Gabon	0.1	0.1	0.1
Libya	0.5	0.4	0.5
Morocco	6.0	16.0	6.0
Nigeria	6.7	7.0	6.7
Tunisia	0.5	0.6	0.5
TOTAL	31.4	42.6	31.4
Non-Communist	1,143.4	1,077.8	1,143.4
United States	1,992.1	2,116.7	1,992.1
TOTAL	3,135.5	3,194.5	3,135.5
COMMUNIST AREA			
Red China	15.0	13.4	15.0
Romania	111.1	109.4	111.1
Russia	720.1	706.0	720.1
Other	52.0	46.0	52.0
TOTAL	898.2	874.8	898.2
WORLD TOTAL	4,033.7	4,069.3	4,033.7

1970 US = 48,968.2
 1971 US = 48,968.2
 1972 US = 48,968.2
 1973 US = 48,968.2

Oxy plant will produce fuel oil from refuse

THE first solid-waste processing plant to produce commercial fuel oil will be designed and engineered by Occidental Petroleum Corp. under a \$4-million program funded mostly by the Environmental Protection Agency.

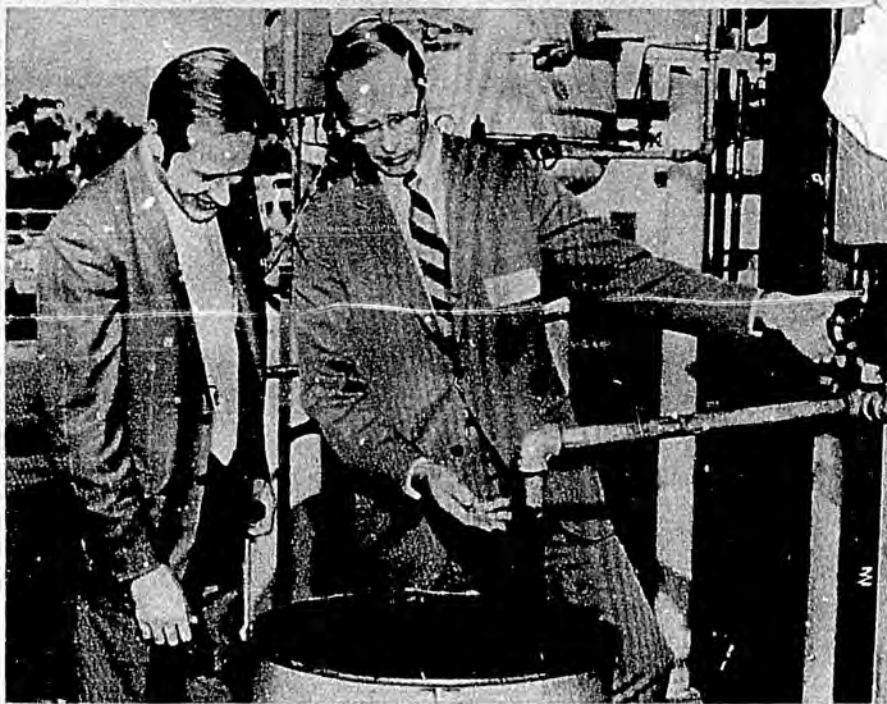
Oxy also will supervise construction of the 200-ton/day demonstration, or prototype, plant in San Diego County, Calif., and use the company's flash pyrolysis process.

The plant, scheduled for operation in late 1974, will convert 92% of the refuse into products, which include 1 bo/ton waste, or 200 b/d. Other products will be glass, metals, char.

The oil will be suitable for replacing No. 6 fuel oil which will be purchased by San Diego Gas & Electric Co. for power generation.

Oxy said that Kreisinger Development Laboratory of Combustion Engineering Inc. test-fired the low-sulfur pyrolytic oil produced earlier by Oxy and reported that the oil, or blends of it with No. 6 fuel oil, "can be successfully burned in a utility boiler with a properly designed fuels-handling and atomization system."

Oxy's Garrett Research & Development division, which has developed the pyrolysis process for converting solid wastes, such as garbage and trash, into marketable products, signed the agreement for the plant with the County of San Diego. Garrett Research will train the operators the first year, after which San Diego



DONALD E. Garrett, Occidental's executive vice-president for research and development, shows Director C. J. Houson of San Diego County's sanitation department how oil is made from garbage.

County will operate the plant.

The EPA will contribute \$2,962,000 toward financing of the plant, which will be virtually pollution-free. San Diego County will contribute \$600,000, Oxy \$300,000 and SDG&E \$150,000.

The plant will be located in the Escondido area, about 32 miles north of San Diego, and will serve a population of 40,000.

The Garrett division, which has demonstrated the pyrolysis process at

its La Verne, Calif., plant, expects the concept to be usable at a 2,000 ton/daily rate and thus serve a city of some 800,000. Such a plant, costing about \$15 million, conceivably could pay for itself through waste-products sale—including 2,000 b/d of fuel oil.

The flash pyrolysis process involves heating solid waste to about 900° F. in the absence of oxygen and requires about 30 min to recover oil after the waste material is introduced.

Companies vying for tracts in Peruvian jungles

ABOUT a dozen international oil companies are at varying stages of negotiation with Peru's state-owned Petroperu for contract exploration blocks in three separate jungle regions.

The areas are the northern Marañon-Pastaza-Napo region where eight companies already signed up are concentrated, the central Ucayali area, and the Madre de Dios area in the southwestern jungle.

The most advanced negotiations are with Cities Service (Madre de Dios region), Signal Companies Inc. with West Germany's Deminex (Ucayali region), and Andes Petroleum Exploration Corp., a Japanese consortium (Madre de Dios region).

As yet there is no indication as to when these contracts might be signed. But an important part of the negotiations, especially for blocks in the north, involve the price to be paid for moving crude through a projected pipeline that would be owned solely by Petroperu.

Stiffer terms. Most negotiations are being conducted on the basis of a 45-55 split of crude in favor of Petroperu, with a 44-56 split when production exceeds 100,000 b/d.

The first contracts, beginning with Occidental Petroleum almost 2 years ago, were based on a 50-50 deal, but Peruvian terms have since stiffened.

The minimum work program for the

first 4 years requires an investment of about \$8-9 million.

Here's a breakout of regions and other companies negotiating for contracts:

- Central Ucayali—Total (France), Hispanoil (Spain), Kleinholz (West Germany), and Texaco's Germany subsidiary.

- Madre de Dios—Getty, Phillips, and Cayman Corp.

- Marañon—Kopex (Poland), negotiating for Block 2 in the far north, Deminex, Amerada Hess, and Oceanic Exploration/El Paso Natural Gas.

Some of these companies already are working on previously acquired blocks. Others, like Deminex and His-

Total wells drilled in the United States*—Aug. 1974†

Data compiled by the American Petroleum Institute

State-district	Total completions					Total wells all types, August 1974		Total exploratory wells				
	Oil wells‡	Gas wells§	Dry holes	excluding service wells, stratigraphic, and core tests		Wells	Footage	Oil wells‡	Gas wells§	Dry holes	August 1974	
				wells	Footage						Wells	Footage
Alabama			2	2	25,372	2	25,372			2	2	25,372
Alaska	5		1	6	33,347	6	33,347			1	1	14,283
Onshore	2		1	3	24,870	3	24,870			1	1	14,283
Offshore	3			3	8,477	3	8,477					
Arkansas	11	1	14	26	138,549	26	138,549	1		8	9	40,116
California	282	9	28	319	624,937	326	645,190	1	2	21	24	145,284
North		8	16	24	139,672	24	139,672		2	13	15	91,135
Central Coastal	15		4	19	51,809	19	51,809			3	3	8,624
East Central	257	1	6	264	379,596	265	381,746	1		3	4	27,435
South	5		2	7	59,454	10	51,450			2	2	18,090
Offshore	5			5	14,406	8	20,513					
Colorado	11	12	24	47	302,317	47	302,317	2	3	18	23	144,560
Onshore			3	3	41,031	3	41,031			2	2	25,716
Offshore												
Florida			3	3	41,031	3	41,031			2	2	25,716
Illinois	35	1	39	75	194,850	77	197,851	3		19	22	56,389
Indiana	11		17	28	40,335	28	40,335	1		12	13	19,763
Kansas	92	22	126	240	705,777	248	715,119	9	3	85	97	316,158
Kentucky	26	14	38	78	114,604	80	116,195	1	1	9	11	16,115
Louisiana	73	75	93	241	1,619,619	246	1,654,732	2	3	36	41	337,423
North	27	51	44	122	483,810	124	489,927	1	3	19	23	159,164
South	27	10	23	60	576,937	60	576,937	1		6	7	85,547
Offshore	19	14	26	59	558,872	62	587,868			11	11	92,712
Michigan	5	2	15	22	111,557	23	114,357	3	2	9	14	75,894
Mississippi	7		27	34	272,322	34	272,322	2		19	21	166,475
Missouri			2	2	2,977	2	2,977			2	2	2,977
Montana	4	17	32	53	169,778	53	169,778	1	2	28	31	119,710
Nebraska	4		11	15	78,597	15	78,597	1		6	7	37,882
New Mexico	29	70	39	138	812,519	140	813,279		8	24	32	144,905
East	18	25	30	73	485,352	74	485,672		8	17	25	108,645
West	11	45	9	65	327,167	66	327,607			7	7	36,260
New York	21			21	24,525	25	29,490					
North Dakota	2		6	8	68,570	8	68,570			3	3	26,494
Ohio	38	61	14	113	400,582	113	400,582	1	8	3	12	50,415
Oklahoma	81	54	110	245	1,304,005	254	1,321,715	2	3	19	24	173,597
Pennsylvania	19	14	1	34	71,534	44	92,042		3		3	9,120
South Dakota			1	1	4,000	1	4,000			1	1	4,000
Tennessee	7		3	10	15,377	10	15,377			3	3	5,650
Texas	396	141	270	807	4,380,304	836	4,460,038	26	53	169	248	1,633,911
Dist. 1	17	8	12	37	131,815	37	131,815	2	2	7	11	50,062
Dist. 2	9	18	25	52	322,284	53	325,602	1	12	17	30	203,741
Dist. 3	31	16	47	94	610,451	95	611,293	3	13	37	53	419,630
Dist. 4	25	32	37	94	571,376	94	571,376	2	12	19	33	214,049
Dist. 5	4	2	14	20	96,749	20	96,749		1	6	7	43,373
Dist. 6	14	8	14	36	219,360	41	222,305			10	10	70,393
Dist. 7B	11	3	12	26	84,990	26	84,990			5	5	20,787
Dist. 7C	50	29	25	104	578,849	114	595,378	5	7	15	27	145,718
Dist. 8	100	8	15	123	713,539	125	723,092	9	2	4	14	145,586
Dist. 8A	70	1	18	89	480,951	98	526,819	1		12	13	76,217
Dist. 9	53	10	39	102	379,650	103	380,329	3	4	25	32	152,358
Dist. 10	12	5	3	20	109,270	20	109,270			3	3	19,385
Offshore		1	9	10	81,020	10	81,020			9	9	72,638
Utah	8		4	12	115,003	12	115,003			3	3	12,560
Virginia		2		2	10,336	2	10,336					
West Virginia	13	58	7	78	208,654	78	208,654	1	4	1	6	19,415
Wyoming	30	2	41	73	518,477	75	532,826	5	1	33	39	318,719
Total—August 1974	1,210	555	968	2,733	12,409,855	2,814	12,619,981	62	96	536	694	3,942,903
Total—July 1974	1,008	461	884	2,353	11,801,777	2,390	11,903,253	73	91	522	686	4,299,061
Cum. 1974	7,960	4,632	7,271	19,868	97,392,862	20,520	98,957,337	511	749	4,187	5,447	32,391,527
Cum. 1973	6,339	3,685	6,371	16,395	82,593,265	17,062	84,200,386	388	465	3,638	4,491	

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from July 27, 1974, through Aug. 23, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests and outpost (extension) tests. ||Includes 10 strat tests and 71 service wells, 16,529 ft and 193,597 ft, respectively.



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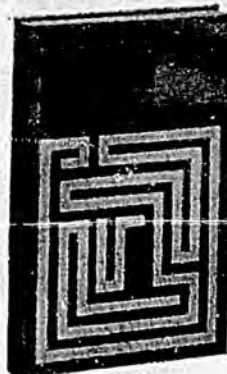
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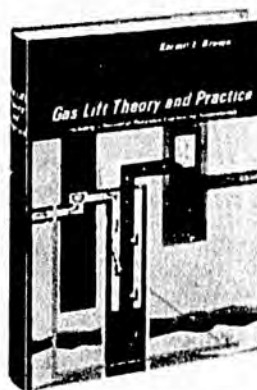
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Total wells drilled in the United States*—February 1974†

Data compiled by the American Petroleum Institute

State-district	Total completions					Total wells all types, February 1974‡		Total exploratory wells§				
	Oil wells‡	Gas wells§	Dry holes	Total wells excluding service wells, stratigraphic, and core tests	Footage	Wells	Footage	Oil wells‡	Gas wells§	Dry holes	Wells	Footage
Alabama	2	2	8	12	128,166	12	128,166	1	1	6	8	82,790
Arizona	2		6	8	55,775	8	55,775			3	3	25,661
Arkansas	9	4	11	24	154,445	24	154,445	3		6	9	71,135
California	77	3	19	99	291,342	105	305,741	2	1	9	12	77,552
North		3	5	8	52,599	9	58,032		1	2	3	23,197
Central Coastal	9		6	15	67,889	17	70,469			3	3	27,369
East Central	54		7	61	134,842	63	139,778			4	4	24,378
South	8			8	20,569	9	22,019	2			2	2,608
Offshore	6		1	7	15,443	7	15,443					
Colorado	30	28	30	88	570,634	89	574,966	2		21	23	143,768
Florida	2		3	5	74,727	5	74,727			2	2	26,803
Georgia			2	2	13,602	2	13,602			2	2	13,602
Illinois	25	2	18	45	104,951	46	105,028	1		9	10	17,969
Indiana	12		12	24	34,646	26	39,642	1		9	10	13,380
Kansas	51	21	75	147	502,161	152	513,463	7	3	46	56	198,690
Kentucky	8	11	21	40	68,374	40	68,374	2		8	10	17,052
Louisiana	68	71	70	209	1,730,468	212	1,755,331		4	31	35	344,807
North	16	44	16	76	330,806	76	330,806		2	7	9	87,073
South	19	11	33	63	664,529	64	672,302		2	15	17	199,027
Offshore	33	16	21	70	735,133	72	752,223			9	9	58,707
Michigan	5	2	14	21	98,425	21	98,425	4	2	10	16	72,530
Mississippi	6	4	28	38	296,739	38	296,739	2	2	22	26	231,890
Missouri			2	2	1,865	2	1,865			2	2	1,865
Montana	4	11	31	46	137,350	47	140,243	1	4	26	31	102,823
Nebraska	1		16	17	88,986	17	88,986	1		12	13	68,127
New Mexico	21	29	18	68	409,860	69	413,210			12	12	58,805
East	20	15	14	49	292,536	50	295,886			9	9	42,788
West	1	14	4	19	117,324	19	117,324			3	3	16,017
New York	5	3		8	14,940	15	24,906					
North Dakota	3		3	6	33,104	6	33,104			2	2	10,234
Ohio	35	74	6	115	502,125	115	502,125		2	3	5	24,248
Oklahoma	38	63	83	234	1,426,962	239	1,446,262	4	7	27	38	290,535
Pennsylvania	63	33	5	101	197,602	113	220,087			5	5	23,416
South Dakota			1	1	7,514	1	7,514					
Tennessee	4		2	6	8,215	6	8,215			2	2	2,025
Texas	339	194	281	814	4,394,184	849	4,470,251	13	59	178	250	1,672,608
Dist. 1	20	8	26	54	235,422	54	235,422	1	2	16	19	116,055
Dist. 2	6	32	24	62	341,724	62	341,724	3	14	13	30	178,832
Dist. 3	25	15	39	79	579,188	79	576,188		10	27	37	342,468
Dist. 4	17	31	37	85	561,290	85	561,290	2	10	26	38	261,412
Dist. 5	7	4	8	19	117,361	19	117,361		3	6	9	87,750
Dist. 6	3	5	5	13	105,934	13	105,934		4	2	6	52,803
Dist. 7B	58	31	50	139	505,309	151	525,355	2	8	30	40	150,713
Dist. 7C	32	23	16	71	405,622	72	407,222	1	1	9	11	58,746
Dist. 8A	85	11	8	104	591,301	104	591,301	2	2	5	9	94,826
Dist. 8A	31	1	13	45	247,908	52	271,340			7	7	41,262
Dist. 9	36	6	28	70	213,181	85	244,170	2	2	18	22	89,555
Dist. 10	18	23	15	56	353,389	56	353,389		1	7	8	87,203
Offshore	1	4	12	17	139,555	17	139,555		2	12	14	110,983
Utah	10	1	4	15	159,951	15	159,951	1		3	4	31,951
Virginia		9	1	10	45,245	10	45,245					
West Virginia	1	31	8	40	148,327	40	148,327		5	6	11	47,413
Wyoming	30	4	38	72	459,623	75	467,020	4	1	28	33	238,012
Total—February 1974	901	600	816	2,317	12,160,308	2,399	12,361,735	49	91	490	630	3,909,691
Total—January 1974	763	577	803	2,143	10,391,797	2,209	10,507,480	51	71	469	591	3,390,989
Cum. 1974	1,664	1,177	1,619	4,460	22,552,105	4,608	22,869,215	100	162	959	1,221	7,300,680
Cum. 1973	1,535	893	1,664	4,092	21,628,601	4,269	22,084,270	107	96	1,022	1,225	—

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Jan. 26, 1974, through Feb. 22, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests, and outpost (extension) tests. ||Includes three strat tests and 79 service wells, 5,799 and 195,628 ft, respectively.

Industry gets more active in geothermal arena

THE nation's leading oil companies are becoming active in the field of geothermal energy, which experts predict will meet about 10% of western states' power needs by the year 2000. At the same time, natural-gas and chemical companies also are reported to be developing an interest in this field.

Most recent indication of this expanding oil-company interest in geothermal energy was the high bids entered at the January (1974) sale of federal geothermal area leases in California, by such firms as Shell Oil, Signal, Natomas, Union Oil, and Standard of California.

Some of those companies, and a number of others, also are actively acquiring leases, doing exploration work, or drilling in Oregon, Idaho, Nevada, Utah, New Mexico, Colorado, and Arizona, in addition to California.

Oil and natural-gas companies, however, face a different set of problems in the geothermal area, problems that grow out of the difference in techniques from those of the oil and gas industries. "But they are quickly learning the differences," according to Mike O'Donnell, executive vice-president of Geothermal Kinetics Inc., a leading geothermal drilling and exploration company headquartered in Phoenix, Ariz.

O'Donnell, whose firm is active in California, New Mexico, Utah, Idaho, and Arizona, agrees with a prediction of William H. Lyons, deputy under-secretary of Interior, who told a Congressional subcommittee studying geothermal energy that there will be abundant geothermal power by the end of this century.

"Well before the year 2000," O'Donnell said, "western utilities will be producing as much as 10% of their needs from geothermal wells."

Virtually every electric utility in the West has turned to geothermal studies to some degree or other, O'Donnell said.

Federal spending. Geothermal activity is quite likely to be accelerated if final approval is given proposed increases in government spending for research and development of known geothermal resource areas (KGRA's).

Commitments for federal-agency spending in this area have been raised for fiscal 1975 to around \$45,000,000 from \$14,232,000 in the current year.

Further, the Atomic Energy Commission, with its fiscal 1975 commitment \$10,700,000 up from \$4,700,000, plans to request and spend \$185,000,000 for geothermal R&D over the next 5 years.

Other federal agencies seeking larger geothermal budgets for fiscal 1975 include National Science Foundation, U. S. Geological Survey, Bureau of Reclamation, Bureau of Land Management, and Bureau of Mines.

This splintered federal effort underscores a proposal several months ago by a leading solar energy expert who suggested a federal NASA-type agency for energy, with total authority over all energy research and development. Dr. Aden B. Meinel, of the University of Arizona, a frequent consultant to government agencies on solar matters, said such a NASA-type agency could concentrate scattered activities with excellent results, and probably quicker than with piece-meal efforts.

Legislation furthering geothermal activities already has passed the Senate by an 82-0 vote, and would set up a Geothermal Resources Development Fund to guarantee loans secured by private and public utilities for exploration, development, construction, and operation of commercial geothermal generating facilities. Guarantees of 75% of loans, up to a maximum of \$25,000,000 would be authorized.

Sen. Paul Fannin (R.-Ariz.) feels that the federal Government has been more of a hindrance than a help thus far in geothermal affairs, but that this bill would stimulate such activity.

While most of today's geothermal activity centers in such areas as California's Imperial Valley, and in Utah, Arizona, and New Mexico, exploration work is being done in the Northern Gulf of Mexico, off the Louisiana and East Texas coasts, where "a tremendous amount of work is going on, and where hot fluid is found with natural gas," according to O'Donnell. Wells in that area are around 17,000 to 20,000 ft in depth.

Another promising area is in Baja California, around Mexicali, where the first Mexican geothermal plant was to go on line late in March, climaxing 20 years' work. This region, just south of the U.S. border is believed to be a southern extension of the 120-mile long Imperial Valley geothermal area.

Although Old Faithful in Yellowstone National Park—America's best-known geyser—was first discovered in 1870, more than 80 years slipped by before Pacific Gas & Electric pioneered U.S. use of this great natural resource for power production. This plant, the world's largest, provides electricity for San Francisco residents.

Italy, meanwhile, had touched off the geothermal age as early as 1904, with a successful commercial natural-steam powered electric plant at Lardello. Five other foreign countries—China, Iceland, Japan, New Zealand, and Russia—now produce geothermal electricity.

Mobil has pair of Wilcox pays

MOBIL Oil Co. has a pair of new Wilcox pays in Clayton field, 13 miles southwest of George West in southern Live Oak County, South Texas.

The 2 Block 86 Unit tested through lower tubing perforations at 8,350-57 ft flowing 2,848 Mcfd and 41 bbl condensate on 14/64-in. choke. Flow rate through the upper tubing perforations at 7,612-32 ft was 888,000 cu ft of gas and some condensate. Location is in Section 331, CCSD&RGNG Survey, A-495.

In Lavaca County, McCormick Oil & Gas Co. has a Frio gas-discovery zone in Esperanza field. The 1 Williams et al. Unit, 3 miles southeast of Hope, flowed 1,106 Mcfd. Pay is at 3,150-56 ft on 12/64-in. choke. Well site is in the S. Thompson Survey, A-555. Esperanza field was opened in 1959 with pays in the Miocene, Yegua, and Wilcox, at 2,300, 2,800, 5,200, and 7,800 ft.

ITALY

ITALY'S AGIP has undertaken a sweeping new appraisal of the Po Valley in northern Italy—particularly deep prospects.

Company hopes today's sophisticated geophysical techniques will reveal prospects that went undetected in early-day exploration of the valley, which has yielded much of Italy's natural-gas production over the years.

AGIP now has seven seismic crews in the field. It says that although re-

gaged in crude production alone. There is no series of data comparable to the QFR covering crude producers. This in itself is not fatal, since the major integrated companies which dominate the QFR category also produce most of the crude oil.

Still, the absence of nonintegrated crude producers raises a question. Average domestic crude prices from 1962-72 were perhaps half what they are today and were the subject of persistent complaints from the crude sector. Would not the inclusion of crude producers show a lower level of profitability for the petroleum industry as a whole?

In fact, the opposite appears to be true. Occasional tabulations of results in crude companies indicate that—during this period of presumably "low" crude prices—the crude producers as a group enjoyed rates of return far higher than either the integrated firms or the nonintegrated independent refiners. Throughout the period, there was a general presumption, never refuted by the companies themselves, that the integrated majors earned their profits primarily in crude production rather than in downstream refining and marketing. Indeed, it is often alleged that in some years several of the majors may have lost money downstream. Regardless of such allegations, it is clear that broadening the QFR industry category to include non-integrated crude producers would raise the reported profitability of the industry.

TABLE 1—RATES OF RETURN ON STOCKHOLDERS' EQUITY, 1962-72

(In percent)

Year	All manufacturing	Petroleum refining	Motor vehicles	Primary iron and steel
1972	10.60	8.62	14.45	6.05
1971	9.67	10.32	13.02	4.53
1970	9.32	10.97	6.07	4.30
1969	11.47	11.72	12.62	7.60
1968	12.07	12.27	14.97	7.57
1967	11.72	12.52	11.67	7.72
1966	13.85	12.42	15.59	9.25
1965	12.90	11.85	19.52	9.75
1964	11.66	11.42	16.87	8.77
1963	10.25	11.30	16.72	7.01
1962	9.775	10.08	16.25	5.88
Average 1962-72	11.17	11.72	14.34	7.18

Source: Average of quarterly rates reported in FTC, "Quarterly Financial Reports."

TABLE 2—TOTAL LIABILITIES AND NET WORTH, END OF YEAR, 1962 AND 1972

(Million dollars)

	Petroleum refining		Other manufacturing	
	1962	1972	1962	1972
Current liabilities:				
Long-term debt:				
Banks	598	2,200	5,127	29,054
Other	3,296	11,111	28,182	82,796
Other noncurrent liabilities	1,542	6,560	5,445	21,914
Total, liabilities	11,997	19,480	92,675	271,652
Stockholders' equity:				
Capital stock, etc.	14,053	19,607	59,185	98,565
Earned surplus	18,253	41,148	90,940	194,535
Total, net worth	32,250	60,744	150,125	293,100
Total liabilities and net worth	44,246	100,217	242,800	564,751

¹ Prior to 1965, QFR included an account, "Reserves not reflected elsewhere." The amounts in this account at the end of 1962 were \$114,000,000 for petroleum refining and \$1,751,000,000 for other manufacturing industries, in each case less than 1 percent of total liabilities and net worth. The QFR explanation when this account was dropped (1st quarter, 1965) was that 80-90 percent would be shifted into "other noncurrent liabilities" and the balance into "earned surplus." Accordingly, the 1962 figures have been restated on the basis of an 85-15 percent division.

² Restated by shifting payments on long-term debt due within 1 year from current liabilities to long-term debt, in order to better portray capital structures.

Source: FTC, "Quarterly Financial Reports", 4th quarter, 1962 and 1972.

Long-term debt:

Banks

Other

Total

Stockholders' equity:

Capital stock, etc.

Earned surplus

Total

Total increase in net

Stockholders' equity

including repayments

Source: Table 2.

Senator S.

[Whereby]

mittee stand

High profits erode in third quarter

Increased taxes and costs, buyer resistance, lower production rates, and the lack of inventory profits and devaluation gains chip away at earnings. Profits for 27 large firms total \$3.67 billion in third quarter — up 49.8%.

THOSE sharp increases in oil-company earnings recorded earlier in the year are eroding.

Although still substantial and in some instances hitting record highs, company earnings are running into such countervailing forces as increased taxes, higher costs, buyer resistance, lower production rates, and the absence of inventory profits and devaluation gains.

Higher profits, however, are still being supported by the higher level of domestic oil and gas prices, by spectacular performance of chemicals, and by improved margins.

These are the trends spotted in the Journal's quarterly review of earnings for the industry's larger firms. As a group, the larger companies showed net earnings for the year's first 9 months of \$10.9 billion, up 67.4%. The total for the third quarter was \$3.67 billion, up 49.8%.

Both 9-month and third-quarter percentage gains for the 27-company Journal group are well under the gains for the first and second quarters, 78.4 and 80.2% respectively.

The slippage for the international majors is more pronounced. Composite earnings gain for the five largest U.S. companies — Exxon, Texaco, Mobil, California Standard, and Gulf — declined from 71.5% in the first quarter to 65.3% in the second quarter—then dipped more sharply to 25.9% in the third.

Texaco, for example, recorded a profits gain of 123% in the first quarter; but by the third quarter its gain over a year earlier was running only 23%. Socal's 91.5% first-quarter gain had dwindled to 32%, and Gulf's 75% to 31%. Exxon had slipped from 39% to 25%, and Mobil from 66% to 20%.

Typical experience. The experience of Exxon Corp., the top industry performer, reveals most of the trends being encountered by oil-industry management this year.

Exxon's consolidated earnings for the first 9 months reached a record \$2,280 million, up 37.7% from \$1,656 million for the same period a year ago. Third-quarter earnings were \$800

How 27 U.S. firms fared in third quarter

In addition, Dorsey reported that it accumulated about \$130 million increased costs through Sept. 30 which it had not been able to recover under Federal Energy Administration pricing formulas.

Other factors were a \$19-million reactive tax increase in Venezuela, reduced crude output in Kuwait and Ecuador, and profits squeezes in Europe and Latin America "caused a temporary surplus of oil products in some markets."

Other gainers. Among the predominantly domestic oil companies, Shell, Arco, and Standard, Union, Phillips, and Continental recorded substantial gains in earnings.

Shell Pres. Harry Bridges, however, pointed out that extraordinary conditions prevailing in the petroleum industry this year reduce the usefulness of measuring performance against previous periods.

Among these conditions, he listed inflation, uncertain crude oil prices, the influence of changing federal regulations on prices, crude-oil allocation, the timing of recovery of increased raw-material costs under new regulations.

intensive search for new energy resources.

Of nearly \$280 million invested so far this year in the search for oil and gas, about \$173 million went for federal offshore leases and the rest to domestic drilling.

Union Chairman and Pres. Fred L. Hartley said the company increased domestic drilling about 30% for 167 net new wells which resulted in about 5,800 b/d more initial production. The higher crude oil price also made it economically possible for Union to keep marginal wells on production and bring back retired wells whose limited output previously had been uneconomical.

"So far we have kept on production about 170 Union-operated wells and have brought back about 70 previously idle wells which would have been abandoned at crude oil prices of 2 years ago. These marginal wells collectively are adding 1,100 b/d to our domestic production," Hartley said.

Union's 9-month earnings were \$232.5 million compared with \$129.1 million last year with third-quarter income of \$79.9 million compared with \$50.7 million.

million, up 25.4% from the \$638 million for 1973.

Exxon Chairman J. K. Jamieson said "worldwide chemical operations continued to be a major contributor" to the earnings. The performance, however, was helped by a 29% gain in domestic operations. These were boosted by higher prices for domestic crude and natural gas resulting from government policies designed to stimulate development of added supplies. The 9-month result was a \$781-million profit from U.S. operations, compared to \$606 million last year.

Exxon's response to these profits was the expenditure of \$898 million in the 9 months for capital and exploration projects, including \$291 million for offshore acreage purchases.

This compares with \$400 million spent in the same period of 1973.

Exxon expects the higher level of capital spending to continue for several years due to commitments on the trans-Alaska pipeline, North Slope development, and refinery expansion. "The amount of future spending approved in the first 9 months exceeds that authorized in any previous full year," Jamieson said, "and this is indicative of the higher level of capital requirements over the coming year which will be necessary to supply future demands for energy."

Jamieson reported that 9-month earnings abroad included inventory profits of \$130 million realized in the first half of 1974 which are not expected to recur. Also, the increased

U.S. corporations and is necessary to finance Skelly's exploration and production program designed to help move the nation closer to energy self-sufficiency." Skelly's 9-month net was \$77.3 million compared to \$27.2 million in 1973.

Cities Service, with an 80% gain for the 9 months to \$168 million, showed a return on average stockholder equity of 13.3% compared with 8.3% a year earlier.

Atlantic Richfield's 9-month earnings of \$377 million represented a 15.5% annualized rate of return on shareholders equity.

Shell converts methane to protein at U.K. facility

METHANE has been successfully converted to protein at Shell Research's Sittingbourne Centre, U.K. Direct conversion to single-cell protein (SCP) was carried out in a continuous 80-gal pilot fermentation plant.

Shell SCP product has a protein content of around 75%. Its nutritive value and amino-acid spectrum approaches that of high-quality white fish meal, with a high proportion of sulfur amino acids. Animal-feed formulations would be similar to that of fish meal and methionine-supplemented soy flour.

Natural-gas feed for a SCP plant would require minimal pretreatment. Process uses mixed microbial cultures, providing more freedom in plant design than single-strain cultures.

Methane-air mixture is passed through an aqueous solution containing ammonia, phosphates and other trace mineral elements, and suspended bacteria. A broth comprising a 2-3% suspension of bacterial cells is drawn off continuously.

After separation, watery culture fluid is returned to the fermenter. SCP is dried to a powder.

Shell says that process economics and market assessments have been made. Initial nutritional and toxicological trials on protein concentrate for use in animal feeds have been satisfactorily completed.

Discussions have been initiated with Dutch authorities for construction of an integrated process and product development unit at Shell laboratories in Amsterdam.

Imperial, Shell, Elf ready tests in Canada's Far North

CANADIAN Far North areas drew three new tests last week as Arctic exploration began showing a modest upswing for the 1974-75 drilling season.

New drilling is scheduled by Imperial Oil Ltd., Shell Canada Ltd., and Elf Oil Exploration & Production Canada Ltd.

Imperial will resume its wildcat-drilling program off the Mackenzie Delta with a 13,000-ft test at B-44 Netserk, 69° 33' 3" N. Lat., 135° 55' 56" W. Long.

Staked on an artificial island in shallow waters, it is Imperial's third offshore test in the Beaufort Sea. Site is 8 miles north of F-28 Adgo, the company's second offshore test and the first offshore discovery in the North American Arctic (see map, OGC, July 22, p. 24).

Hi-Tower Drilling Division's Rig 1 will drill the Netserk test.

Shell's new operation is L-24 Kugpik, a 10,700-ft delineation well at 68° 53' 31.52" N. Lat., 135° 22' 13.09" W. Long., on the Mackenzie Delta. Loca-

tion is 2 miles northeast of Shell's O-13 Kugpik discovery of August 1973 which flowed a maximum rate of 1,355 b/d of oil and 800 Mcfd of gas through 23/64-in. choke from pay at 7,128 to 7,455 ft.

Adeco Drilling & Engineering Co. Ltd.'s Rig 5 holds the contract. It's one of three rigs Shell has under contract for its 1974-75 program on the Delta.

Banks wildcat. Elf, acting as operator for the Elfex group, staked a 12,000-ft wildcat on Banks Island as D-16 Kusshaak, 73° 25' 3.5" N. Lat., 120° 5' 18.3" W. Long. There are no nearby discoveries.

Brinkerhoff Drilling Canada Ltd.'s Rig 19 will drill the test, part of an exploration program on 11.8 million acres of exploration permits in the western Canadian Arctic.

Elf's partners are Tenneco Oil & Minerals Ltd., Columbia Gas Development of Canada Ltd., Texas Eastern Exploration of Canada Ltd., Norlands Petroleum Ltd., and Panarctic Oils Ltd.

Canada price hike allowed pass-through

THE Federal Power Commission has bowed to the 39¢/Mcf gas-price increase (to \$1/Mcf) imposed by the Canadian Government on exports to the U.S.

FPC approved a rate increase of \$121,463,326 allowing Northwest Pipeline Corp. to pass through the higher costs of imports above the previous price of 61¢/Mcf.

Northwest receives 860 MMcf from Westcoast Transmission Co., its Canadian supplier, at Sumas, Wash., and Kingsgate, B.C. The pipeline must start paying \$121.5 million more for Sumas deliveries Nov. 1 and \$13,940,113 more Jan. 1.

Northwest can't start passing through the higher rates for Sumas gas until Nov. 18, 45 days after the increase was filed with FPC. The difference will be placed in the pipeline's unrecovered purchased-gas cost account, and Northwest may attempt to recoup in a future rate filing.

Northwest said it knows of no other supply of gas in the volumes available

from Canada, and so it has no choice but to pay the higher price. FPC decided it had no choice but to approve the increase.

Exxon resumes oil flow in Libya, LNG shipments to Spain

EXXON CORP.'S Esso Libya has resumed limited oil production in Libya and is resuming shipments of LNG to Spain's Gas Natural but not to Italy's Snam Progetti.

Oil production from Zelten, Raguba, and other fields producing a total of 255,000 b/d were shut in by the government in early October when Snam refused to accept an LNG price increase ordered by the Libyan Government. The boost was reported to be about \$1.60/MMBTU from about 50¢/MMBTU. The Libyans refused to permit associated gas to be flared.

PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.

Annual refining survey

AILEEN CANTRELL
Director of Editorial Surveys

The following tabulation of operating refineries of the United States and Canada shows facilities on stream as of Jan. 1, 1974.

Projects completed after that date are listed in the construction table presented in the Worldwide Construction Survey issue, April 8. A list of shutdown refineries which are still operable is included below.

The list of operating plants is restricted

to facilities charging whole crude, plus lube plants not charging whole crude.

Figures for most plants are expressed in barrels per stream day. However, a few companies reported only calendar-day figures. To arrive at consistent stream-day totals for states, calendar-day figures were converted to stream-day basis, using a 0.95 factor in the case of crude and vacuum units, and a 0.90 in the case of all other processes. This explains what may appear to be discrepancies in the addition of some columns. The letters NR means not reported.

Reprints of this survey are available at \$2 per copy by writing Book Department, The Oil and Gas Journal, Box 1260, Tulsa, Okla. 74101.

Detailed breakdown by company, plant, and state starts next page. Included are:

- U.S. crude and downstream-processing totals by states, p. 84.
- Detailed U.S. survey, p. 85.
- Canadian processing totals by provinces, p. 104.
- Detailed Canadian survey, p. 104.

U.S. refineries: where, capacities, types of processing

LEGEND

Processes in table are
identified by numbers

Cat Hydrotreating

1. Residual desulfurizing
2. Heavy gas-oil desulfurizing
3. Residual visbreaking
4. Cat cracker and cycle stock feed pretreatment
5. Middle distillate
6. Other

Cat Hydrotreating

1. Pretreating cat-reformer feeds
2. Naphtha desulfurizing
3. Naphtha olefin or aromatics saturation
4. Straight-run distillate
5. Lube oil "polishing"
6. Other distillates
7. Other

Aromatics/Isomerization

1. BTX
2. Hydrodealkylation
3. Cyclohexane
4. C₁ feed
5. C₅ feed
6. C₅ and C₆ feed

Cat Reforming

- Semiregenerative:
1. Conventional catalyst
 2. Bimetallic catalyst
- Cyclic:
3. Conventional catalyst
 4. Bimetallic catalyst
- Other:
5. Conventional
 6. Bimetallic

Cat Hydrocracking

1. Distillate upgrading
2. Residual upgrading
3. Lube-oil manufacturing
4. Other

Thermal Process

1. Gas-oil cracking
2. Visbreaking
3. Fluid coking
4. Delayed coking
5. Other

Alkylation

1. Sulfuric acid
2. Hydrofluoric acid

Cat Cracking

1. Fluid
2. Thermofor
3. Houdrflow

NR—Not reported

Three U.S. plants are shut down but are still in operating condition. Capacities are given in barrels per stream day.

Chevron Asphalt Co., Mobile, Ala., 6,500
Chevron Asphalt Co., Cincinnati, Ohio, 12,500
Mobil Oil Corp., East Providence, R.I., 10,000

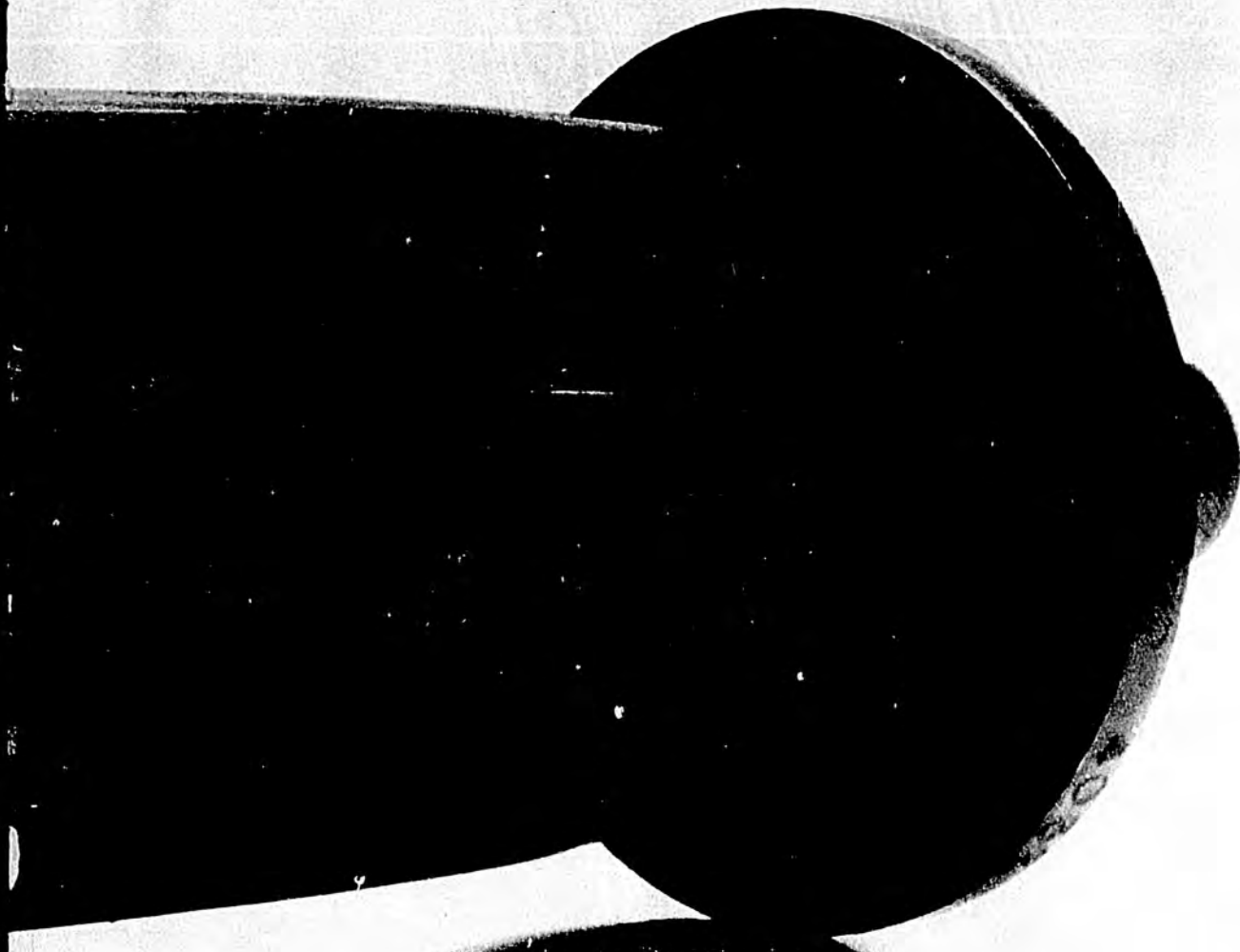
These plants will be reactivated:

Anderson Refining Corp., Tucker, Tex. bought by J&W
Refining, Palestine, Tex., 2,400 b/d.

Cosden Oil & Chemical Co., Hawley, Tex. bought by
Tesoro Petroleum Corp. 6,500 b/d.
Danahoe Refining Co., Pettus, Tex. (same owner),
10,000 b/d.
Hess Oil & Chemical Corp., Port Isabel, Tex. (same
owner) 14,300 b/d.
R. J. Oil & Refining Co. Inc., Terre Haute, Ind.,

bought by Crystal Oil Co. 7,700 b/d.
Somerset Refining, Troy Division, Troy, Ind. bought
by Indiana Farm Bureau Coop. 15,000 b/d.
U.S. Oil & Refining Co., Long Beach, Calif. (same
owner), 5,265 b/d.
Wickett Refinery Co., Wickett, Tex. bought by Adobe
Oil & Gas Corp. and Tom Brown Inc., 6,000 b/d.

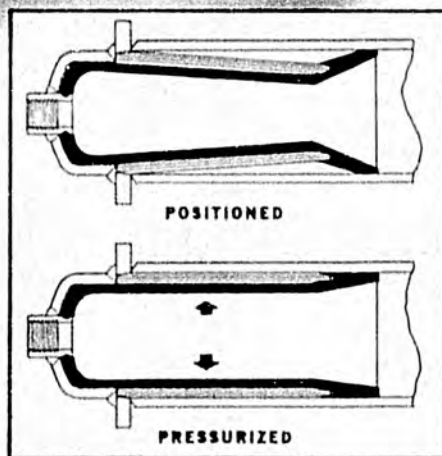
No threading. No beveling. No kidding.



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Yellow Pages under "Pipe Fittings." Or write for bulletin TT 1188, Tube Turns, Division of Chemetron Corporation, Louisville, Kentucky 40201.

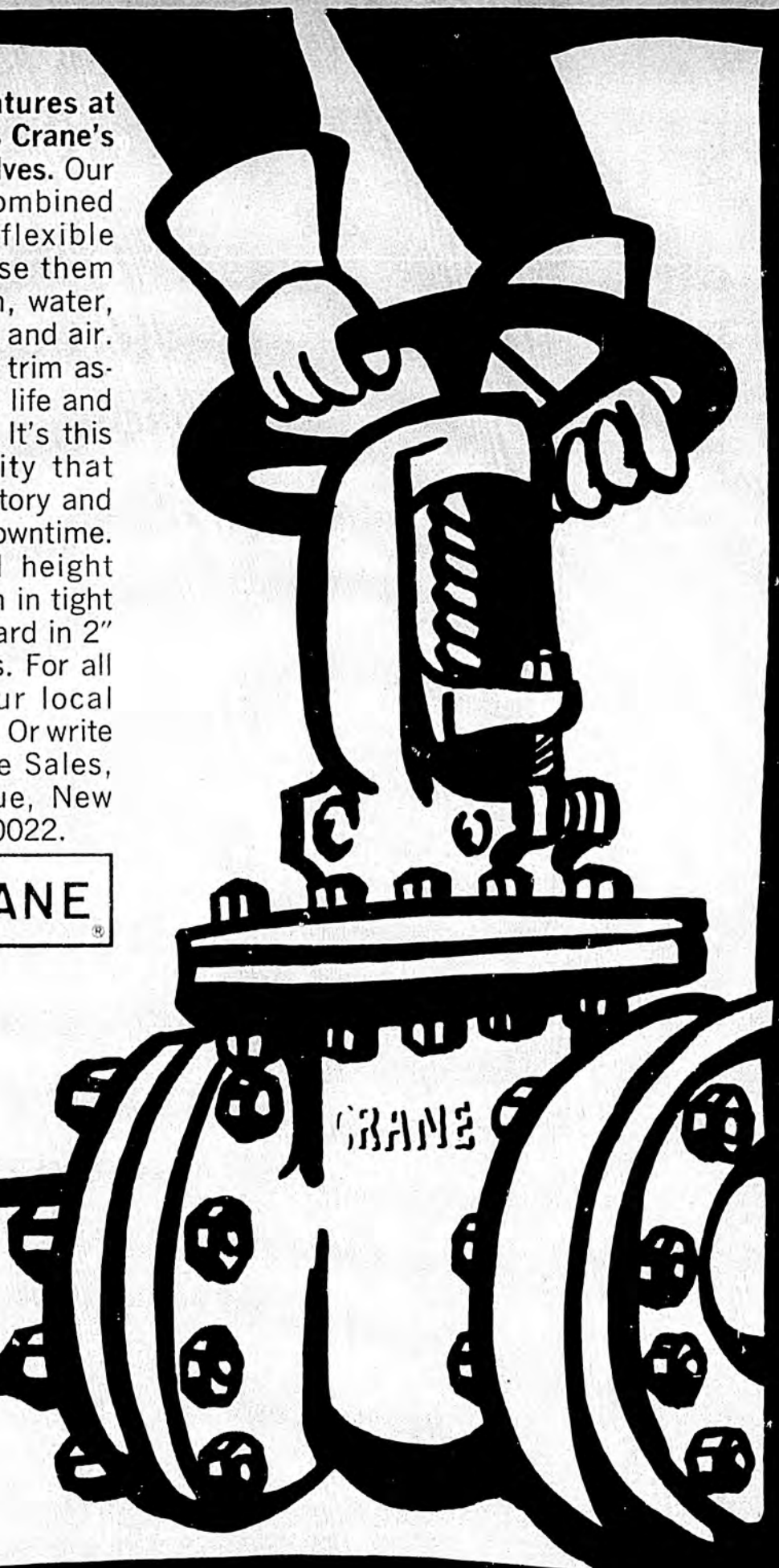
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Survey of operating refineries in the U.S. (state capacities as of Jan. 1, 1974)*

State	No. plants	Crude capacity—b/sd		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
		b/cd	b/sd			Fresh feed	Recycle					Alkyl-ation	Aromatics/isomerization	Lubes	Asphalt	
Alabama	4	35,421	37,010	8,660				1,400			5,000				6,926	
Alaska	4	66,050	69,020												300	
Arizona	1	9,000	10,000	4,000												
Arkansas	4	56,125	58,000	23,800	5,000	15,000	5,200	5,500		5,000	8,000	4,000		2,100	9,650	
California	34	1,809,295	1,894,800	958,200	452,820	481,610	122,730	476,540	317,629	138,250	662,020	83,390	12,490	23,770	98,410	15,165
Colorado	3	55,800	57,920	10,500	14,500	20,500	2,450	11,900			17,000				3,300	400
Delaware	1	140,000	150,000	90,700	44,000	62,000	15,000	42,000	17,000		110,000	8,000				1,800
Florida	1	5,000	5,500	2,400											2,500	
Georgia	2	14,375	15,130							1,200					9,300	
Hawaii	2	70,000	73,689	15,000		14,100	8,900				1,400	4,130	1,350		1,300	
Illinois	11	1,151,500	1,206,390	415,730	143,300	390,270	81,240	312,280	66,500	107,000	435,280	89,020	10,200	5,600	42,800	4,380
Indiana	7	551,000	588,050	243,000	22,500	206,500	36,780	98,000		29,500	213,000	35,700	6,500	8,670	47,000	730
Kansas	11	401,823	418,050	93,800	43,200	155,900	46,700	81,900	2,950	7,500	100,400	38,070	3,400	4,000	16,400	1,310
Kentucky	3	159,800	167,000	65,000	4,000	63,000	6,700	25,500			42,500	6,000	21,500		13,500	
Louisiana	18	1,666,600	1,733,180	461,090	147,830	598,280	130,830	362,930	78,500	99,000	403,410	138,290	23,500	48,450	35,880	5,250
Maryland	2	23,500	24,740	13,800											19,000	
Michigan	6	137,080	147,230	44,800		38,000	9,950	32,750		17,700	31,100	5,450	2,000		11,650	
Minnesota	3	190,420	198,000	78,000	23,000	65,400	8,200	30,100		27,000	65,100	11,500			42,000	1,300
Mississippi	5	289,700	298,390	152,563	6,700	70,500	6,350	70,700	62,000		41,450	9,200	6,000		7,270	320
Missouri	1	105,000	110,530	40,000	11,000	38,000	12,000	14,000			45,000	5,000			6,500	450
Montana	8	158,481	166,200	48,350	8,600	49,800	26,200	36,850	4,900		104,400	10,400	4,700		17,625	250
Nebraska	1	5,000	5,500	2,000		2,000	600	1,000								
New Jersey	5	619,000	646,131	318,380	40,340	249,440	63,830	100,440		50,000	236,450	21,610		6,400	71,000	975
New Mexico	6	55,359	57,130	12,500	1,250	12,200	5,060	11,700			11,450	3,100			2,240	
New York	2	107,600	111,000	43,000		39,000	12,000	22,700		20,000	26,100	4,800	2,500		17,500	
North Dakota	2	52,658	55,530		1,100	23,000	11,000	10,200			12,600	2,900				
Ohio	7	572,400	606,500	173,500	27,800	200,000	52,100	170,700	82,000	42,000	159,000	35,300		2,100	27,900	1,260
Oklahoma	12	481,000	497,695	156,110	69,070	184,100	42,230	112,490	4,500		136,590	41,280	16,610	10,600	21,010	1,445
Oregon	1	14,000	14,740	15,000											8,600	
Pennsylvania	11	689,620	729,215	247,778	26,750	196,900	20,700	197,208	32,700	133,000	227,750	38,100	57,900	29,628	35,500	
Tennessee	1	29,000	30,000			12,000						3,500			3,000	
Texas	40	3,732,875	3,896,560	1,277,560	344,750	1,199,370	268,535	980,510	151,170	289,500	1,427,650	211,160	172,410	86,020	64,720	6,025
Utah	6	133,150	140,620	34,800		53,400	17,000	18,500	1,000	7,000	13,600	8,850	2,550		4,700	
Virginia	1	53,000	55,790	28,000	14,000	26,500	4,000	8,000			22,000					710
Washington	7	346,500	361,100	132,700	36,000	89,280	27,330	76,890	35,000	20,500	133,780	21,330	2,900	1,900	9,600	1,500
West Virginia	3	19,550	20,500	8,675				6,160		4,440	7,510			6,600		
Wisconsin	1	37,000	38,000	15,500		9,700	1,000	8,200		5,800	8,200	1,200			12,000	
Wyoming	10	172,605	181,210	65,110	4,440	52,830	16,420	30,990		15,440	52,540	7,800	1,500	1,280	14,520	140
Total	247	14,216,287	14,876,050	5,300,006	1,491,950	4,610,580	1,061,035	3,358,038	855,840	1,019,830	4,760,280	849,080	348,010	237,118	683,601	43,410

*State totals include figures converted to calendar day or stream day basis.

Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd					Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Cat cracking Fresh feed	Cat cracking Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkyl-ation	Aromatics-isomerization	Lubes		Asphalt
ALABAMA														
Hunt Oil Co.—Tuscaloosa	15,000	15,750	8,660				1,400			1,500				5,200
Marion Corp.—Mobile	15,000	15,500								3,500				
Vulcan Asphalt Refining Co.—Cordova	3,000	NR												
Warrior Asphalt Corp.—Holt	2,421	2,600											1,726	
Total*	35,421	37,010	8,660				1,400			5,000			6,926	

*State total includes figures converted to stream day basis.

ALASKA															
Atlantic Richfield Co.—North Slope	4,800	NR													
British Petroleum Co.—North Slope	1,250	NR													
Standard Oil Co. of California—Kenai	22,000	NR												300	
Tesoro-Alaskan Petroleum Corp.—Kenai	38,000	39,500													
Total*	66,050	69,020												300	

*State totals include figures converted from calendar day to stream day basis.

ARIZONA															
Arizona Fuels Corp.—Fredonia	NR	10,000	4,000												
Total*	9,000	10,000	4,000												

*State total includes figure converted to calendar day basis.

ARKANSAS															
Berry Petroleum Co. (subsidiary of Crystal Oil Co.), Stephens	3,000	3,500	1,000											1,000	
Cross Oil & Refining Co., Smackover	4,850	5,000	2,000							⁵ 1,500			1,300	1,400	
Lion Oil Co., El Dorado	44,000	45,000	18,000	[*] 5,000	¹ 8,500 ² 6,500	4,000 1,200	¹ 5,500		⁵ 5,000	¹ 6,500	¹ 4,000		800	6,000	
MacMillan Ring-Free Oil Co. Inc.—Norphlet	NR	4,500	2,800											1,250	
Total†	56,125	58,000	23,800	5,000	15,000	5,200	5,500		5,000	8,000	4,000		2,100	9,650	

*Solvent. †State totals include figures converted to calendar-day basis.

CALIFORNIA															
Atlantic Richfield Co.—Carson	165,000	173,000	93,000	¹ 12,500 ² 42,000 ³ 30,000	¹ 57,000	8,000	¹ 34,000	¹ 19,700	⁵ 18,000	¹ 34,000 ² 18,000	¹ 7,200	¹ 2,490			1,800
Beacon Oil Co.—Hanford	12,000	12,100		¹ 500 ² 2,750			¹ 1,650								

Company and location	Crude capacity—		Vacuum distillation	Thermal operations	Charge capacity—b/sd					Production capacity—b/sd				Coke (t/d)		
	b/cd	b/sd			Cat cracking—Fresh feed	Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Bat hydro-treating	Alkyl-ation	Aromatics-isomerization	Lubes		Asphalt	
Champlin Petroleum Co.—Wilmington	29,000	30,000	18,000	10,000												575
Douglas Oil Co., of California—Paramount	35,000	36,000	21,000				26,400		9,800	26,400					14,000	
Santa Maria	8,200	8,500	7,500												5,800	
Edgington Oil Co.—Long Beach	29,000	29,500	19,000												7,500	
Edgington Oxnard Refinery—Oxnard	NR	2,500														
Exxon Co.—Benicia	87,000	95,000	53,000	21,600	43,000	14,000	24,000	22,000	22,000	22,000	11,500					900
Fletcher Oil & Refining Co.—Carson	15,800	16,200					24,500			4,500						
Golden Bear Division, Witco Chemical Corp.—Oildale	10,500	11,000	9,500										4,000	3,200		
Golden Eagle Refining Co. Inc.—Carson	NR	13,000														
Gulf Oil Co.—Santa Fe Springs	51,500	53,800	25,000	13,800	13,500	300	19,000	11,000		12,000	3,000				4,000	
Kern County Refining Inc.—Bakersfield	12,900	NR		6,200			2,500									
Lunday-Thagard Oil Co.—South Gate	5,000	5,200	3,000												1,600	
MacMillan Ring-Free Oil Co. Inc.—Signal Hill	9,500	10,000														
Mobil Oil Corp.—Torrance	123,500	130,000	95,000	16,000 46,640	56,000	None	17,500 18,500	18,000		23,000 15,000 25,000	10,500					2,800
Mohawk Petroleum Corp. Inc.—Bakersfield	22,100	22,800					2,600			2,600						
Newhall Refining Co. Inc.—Newhall	7,500	8,000	5,000												3,000	
Phillips Petroleum Co.—Avon	110,000	NR	74,500	42,000	47,000	NR	32,500	22,000		34,500	10,500	2,700	1,670			1,200
Powerine Oil Co.—Santa Fe Springs	28,500	30,000	15,000		11,000	1,000	6,300		8,000 8,000 8,000	7,000	2,300				5,000	
San Joaquin Refining Co.—Oildale	17,000	18,000	7,000												3,360	
Sequoia Refining Corp.—Hercules	27,000	28,300	5,900				15,800	2,900		15,400						
Shell Oil Co.—Martinez	100,000	103,000	55,300		46,000	40,000	25,000	19,000	50,000	17,000 6,300 16,000 11,000 11,000 28,000 33,000 11,000			4,500	10,400		
Wilmington	96,000	101,000	60,000	30,000	35,000	5,000	21,000				8,600	3,800				1,800
Standard Oil Co. of California—Bakersfield	26,000	NR					5,400			5,400					1,100	
El Segundo	230,000	NR	103,000	54,000	43,500	11,000	60,000	49,000		40,000 12,000 18,000 44,000 3,200	5,900	1,500		8,300	2,200	
Richmond	190,000	NR	150,000		43,500	11,000	70,500	41,500 26,000			9,200	2,000	10,000	11,000		
Sunland Refining Corp.—Bakersfield	8,800	9,000					1,000									

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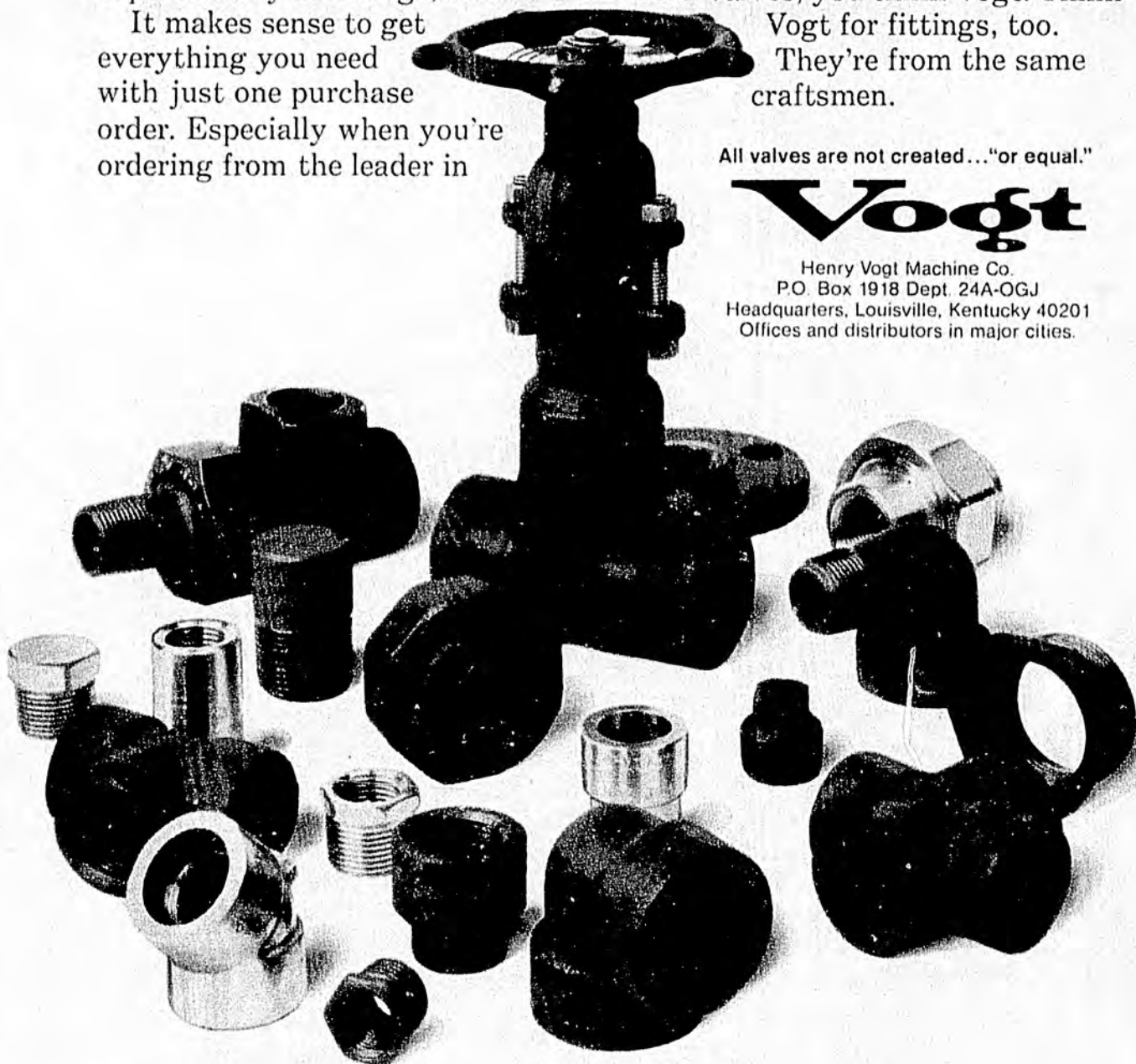
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Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Fresh feed	Recycle					Alkyl-ation	Aromatics-isomerization	Lubes	Asphalt	
Tenneco Oil Co.—Bakersfield	1,200	NR	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texaco Inc.—Wilmington	75,000	NR	.....	48,000	28,000	NR	35,000	20,000	13,000	20,000	4,400	.....	.....	.....	1,650
Tosco Petro Corp.—Bakersfield	26,570	27,000	17,000	7,000	10,000	2,000	14,500	13,300	.....	5,000	1,800	.....	.....	.....	210
Union Oil Co. of California—Los Angeles	108,000	111,000	83,000	20,000	45,000	7,000	29,000	21,000	.....	37,000 33,000	8,000	.....	.....	10,000	.....
San Francisco	111,000	115,000	38,500	42,500	.....	.....	26,000	30,000	.....	21,000 9,000 14,000	.....	.....	3,600	6,150	1,850
West Coast Oil Co.—Bakersfield	16,000	NR	.....	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,000	.....
Total	1,809,295	1,894,800	958,200	452,820	481,610	122,730	476,540	317,620	138,250	662,020	83,390	12,490	23,770	98,410	15,165

*Gasoline. †Turbine fuel. ‡Jet fuel. \$All figures are calendar day. Stream-day figures not reported. ¶Turbine aromatics saturation ††State totals include figures converted to stream-day or calendar day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

COLORADO

Gary Western Co.—(Gilsonite) Grand Junction	8,300	8,500	.....	8,500	.....	.....	1,600	.....	.....	2,500	.....	.....	.....	.....	400
Continental Oil Co.—Commerce City	30,000	31,000	7,000	.....	14,000	500	6,500	.....	.....	7,000 7,500	.....	.....	.....	3,300	.....
The Refinery Corp.—Commerce City	17,500	NR	3,500	6,000	6,500	NR	3,800	.....	.....	.....	.....	.....	.....	.....	.....
Total*	55,800	57,920	10,500	14,500	20,500	2,450	11,900	.....	.....	17,000	.....	.....	.....	3,300	400

*State totals include calendar day figure converted to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

DELAWARE

Getty Oil Co. (Eastern Operations) Inc.—Delaware City	140,000	150,000	90,700	44,000	62,000	15,000	42,000	17,000	.....	45,000 10,000 25,000 20,000	8,000	.....	.....	.....	1,800
Total	140,000	150,000	90,700	44,000	62,000	15,000	42,000	17,000		110,000	8,000				1,800

FLORIDA

Seminole Asphalt Refining Inc.—St. Marks	5,000	5,500	2,400											2,500	
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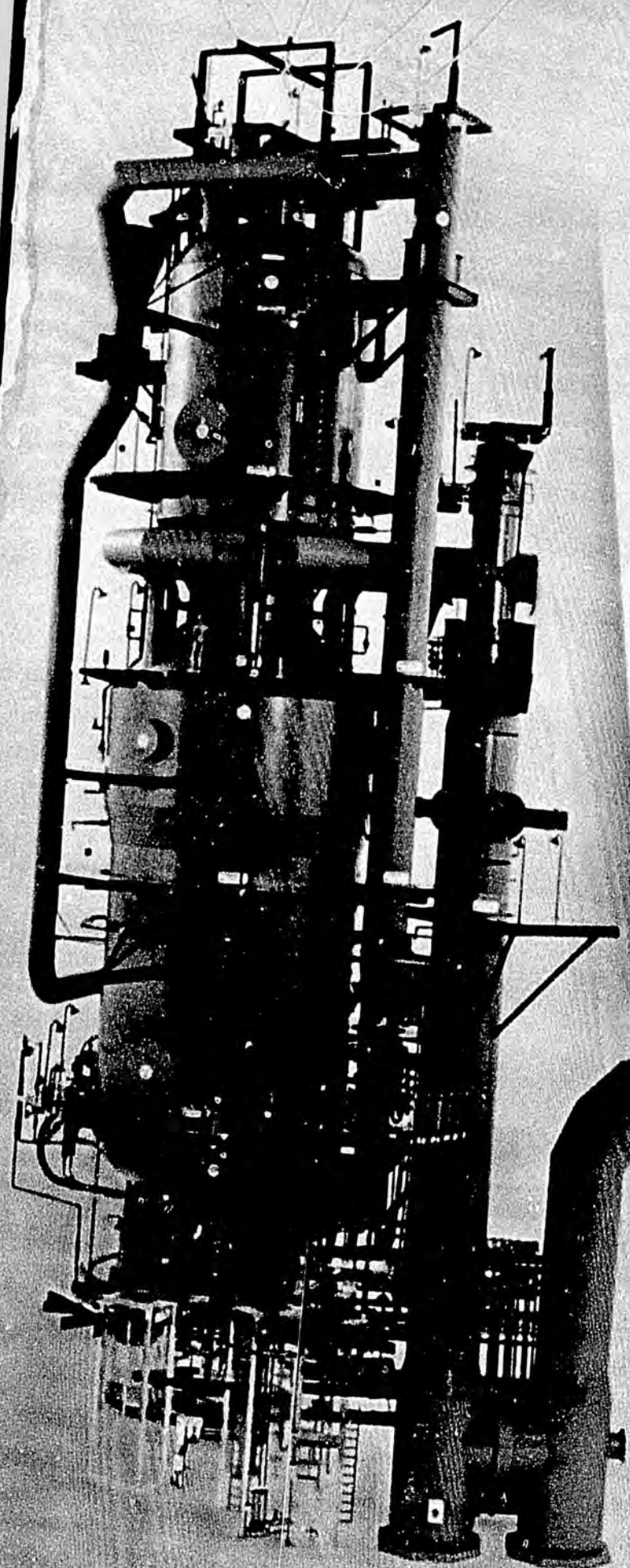
GEORGIA

Amoco Oil—Savannah	12,000	NR												8,000	
Young Refining Corp.—Douglasville	NR	2,500							1,200					1,300	
Total*	14,375	15,130	.....	.....	.....	.....	.....	.....	1,200	.....	.....	.....	.....	9,300	.....

*State total includes figures converted to stream day or calendar day basis.

HAWAII

Hawaiian Independent Refinery Inc.—Barber's Point	30,000	NR													
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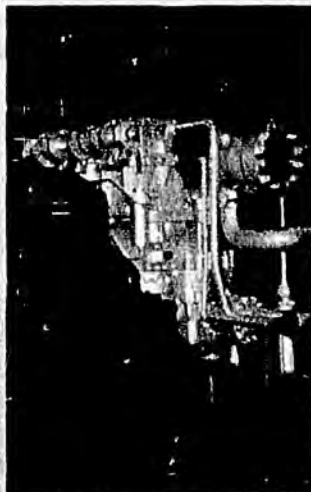
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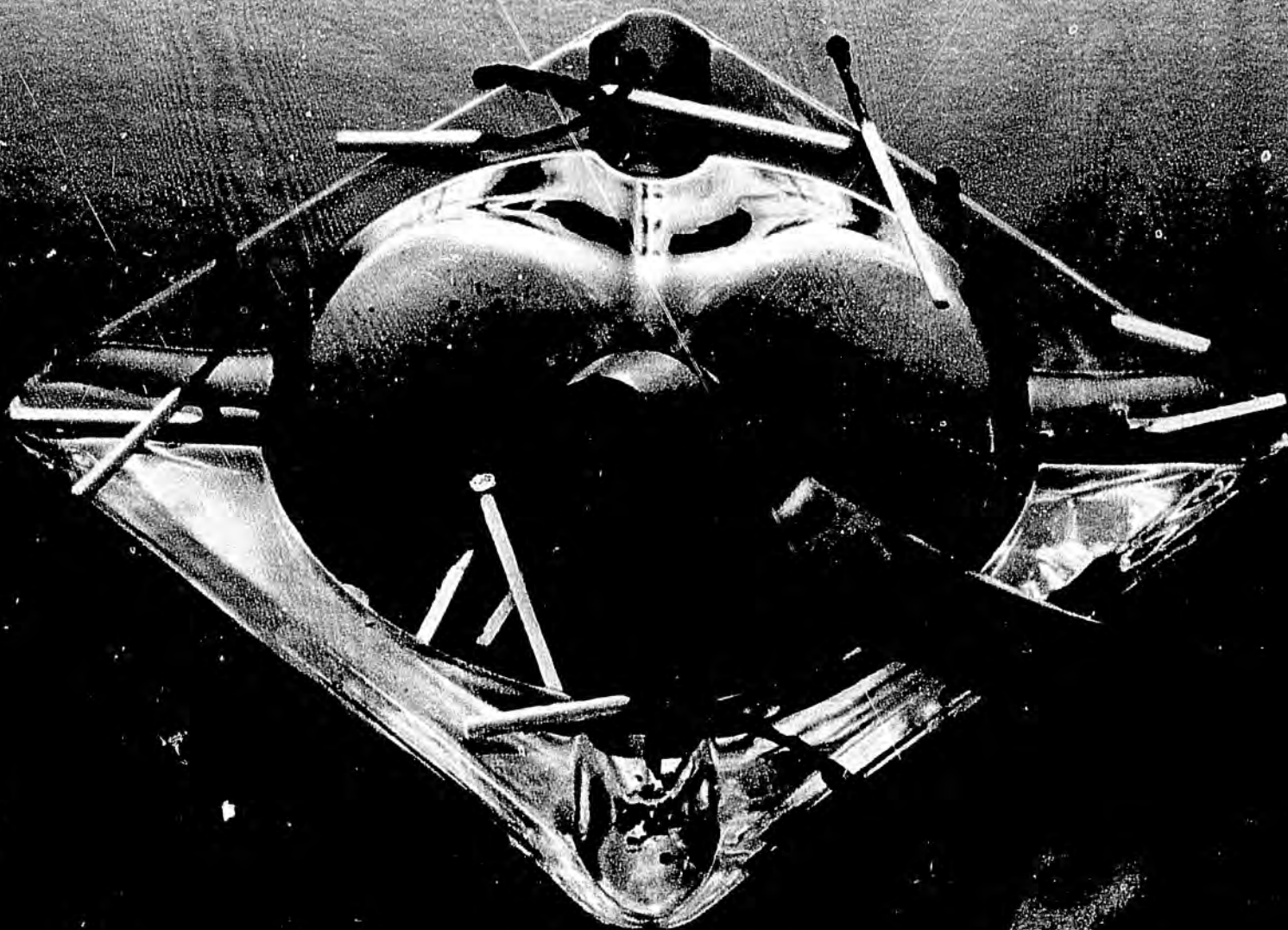
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Company and location	Crude capacity—b/cd		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Cat cracking—Fresh feed	Recycle					Alkyl-tion	Aromatics-isomerization	Lubes	Asphalt	
Standard Oil Company of Calif.—Barber's Point	40,000	NR	15,000		¹ 14,100	8,900				³ 1,400	² 4,130	⁴ 1,350		1,300	
Total*	70,000	73,689	15,000		14,100	8,900				1,400	4,130	1,350		1,300	
*State totals include figures converted to stream day basis.															
ILLINOIS															
Amoco Oil Co.—Wood River	107,000	NR	40,000		¹ 38,000	4,000	³ 12,300			¹ 15,600	¹ 5,500			10,800	
Clark Oil & Refining Corp.—Blue Island	68,000	70,000	27,000		¹ 24,000	1,000	³ 30,500	¹ 11,000		¹ 20,500	² 6,000			4,500	
Hartford	36,000	38,000	15,000	⁴ 13,000	¹ 26,000	1,000	³ 9,200			¹ 9,200	² 7,500				450
Marathon Oil Co.—Robinson	195,000	205,000	62,000	¹ 2,800	¹ 36,500	8,000	¹ 14,000	¹ 22,000	⁶ 6,000	¹ 22,000	² 7,600				900
Mobil Oil Corp.—Joliet	175,000	186,000	82,000	⁴ 19,000	¹ 66,000	NR	³ 33,300			¹ 67,000	² 22,000				1,700
Shell Oil Co.—Wood River	260,000	268,000	91,500	² 21,000	¹ 80,000	18,000	¹ 22,000	¹ 33,500	⁴ 32,000	² 64,000	¹ 19,400	² 2,900	5,600	22,500	
							³ 65,000			² 7,000		⁴ 4,000			
										⁶ 49,000					
										³ 34,000					
										¹ 6,000					
Texaco Inc.—Lawrenceville	84,000	NR	24,000	¹ 9,000	¹ 31,000	NR	¹ 24,000			¹ 24,000	¹ 3,000			2,700	
Lockport	72,000	NR	14,000	⁴ 27,000	¹ 30,000	NA	¹ 19,000			¹ 19,000	¹ 4,400				300
Union Oil Co. of California—Lemont	152,000	NR	55,000	⁴ 19,500	¹ 52,000	8,000	³ 32,000			¹ 32,000	¹ 12,800	¹ 3,300		2,000	1,000
										² 2,700					
										³ 4,500					
										⁴ 7,000					
										⁶ 34,500					
										⁵ 2,500					
Wireback Oil Co.—Plymouth	1,500	1,500													
Yetter Oil Co.—Colmar	1,000	NR	1,000												
Total†	1,151,500	1,206,390	415,730	143,200	390,270	81,240	312,280	66,500	107,000	435,280	89,020	10,200	5,600	42,800	4,380

*Turbine. †Special fuels. ‡All figures are calendar day. Stream-day figures not reported. §Benzene concentrate treater. ¶State totals include figures converted to stream-day basis. Cat-cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

INDIANA															
Amoco Oil—Whiting	315,000	NR	140,000	⁴ 14,500	¹ 118,000	28,000	⁴ 56,000			⁶ 4,500	¹ 104,000	¹ 23,000	⁴ 6,500	8,670	31,000
										⁴ 39,000					730
										² 18,000					
Atlantic Richfield Co.—East Chicago	126,000	140,000	70,000		¹ 48,300	2,000	¹ 20,300			² 25,000	¹ 20,000	¹ 6,000		10,400	
										² 2,000					
Gladieux Refinery Inc.—Fort Wayne	10,000	NR													
Indiana Farm Bureau Cooperative Association Inc.—Mt. Vernon	15,000	15,200	6,000		¹ 5,000	780	¹ 3,000			¹ 3,000	² 1,500				
Laketon Asphalt Refining Inc.—Laketon	8,500	NR	5,000											2,600	
Mobil Oil Corp.—East Chicago	47,000	50,800	8,000	¹ 3,500	² 20,500	1,500	² 11,000			¹ 14,500	¹ 3,200				
				² 4,500											
Rock Island Refining Corp.—Indianapolis	29,500	31,000	14,000		¹ 15,000	NR	² 8,000			¹ 12,500	² 2,000			3,000	
Total*	551,000	588,050	243,000	22,500	206,500	36,780	98,000		29,500	213,000	35,700	6,500	8,670	47,000	730

*State totals include figures converted from calendar day to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd				Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Cat cracking Fresh feed	Recycle	Cat reforming	Alkylolation				Aromatics-isomerization	Lubes	Asphalt		
KANSAS																
American Petrofina Inc.— El Dorado	25,000	NR			¹ 11,000	500	¹ 4,000			¹ 4,000	² 2,000				2,000	
Apco Oil Corp.—Arkansas City	25,000	26,000	5,000		¹ 9,000	3,000	² 6,300	¹ 2,950		¹ 6,800	¹ 2,500				1,400	
CRA Inc.—Coffeyville	35,000	36,000	12,500	⁴ 8,500	¹ 13,500	700	³ 8,600		³ 3,000	¹ 11,800	² 4,500			1,500		300
Phillipsburg	20,000	21,000	7,500		¹ 7,000	350	⁴ 3,500		¹ 4,500		² 1,570				2,000	
Derby Refining Co.—Wichita	25,873	27,000	8,800	⁴ 3,800	² 10,450	2,100	² 5,000			¹ 5,000	² 3,000					160
Mid America Refinery Co. Inc.— Chanute	3,100	3,300	1,800													
Mobil Oil Corp.—Augusta	50,000	52,000	17,700	¹ 4,100	² 20,700	2,800	⁴ 10,000			¹ 10,000	² 3,800				8,000	
National Cooperative Refinery Association—McPherson	54,150	57,000		⁴ 17,000	¹ 20,000	1,000	⁶ 7,000*			¹ 8,000	² 6,000	⁴ 2,000				350
North American Petroleum Corp.— Shallow Water	5,000	NR	2,500		² 2,250	2,250					² 1,200					
Phillips Petroleum Co.— Kansas City	85,000	NR	15,000		¹ 32,000	16,000	¹ 16,000			⁶ 27,500	² 7,500			2,500	3,000	
Skelly Oil Co.—El Dorado	73,700	75,000	23,000	⁴ 9,800	¹ 30,000	18,000	² 21,500			¹ 23,000 ³ 4,300	² 6,000	¹ 1,400				500
Total†	401,823	418,050	93,800	43,200	155,900	46,700	81,900	2,950	7,500	100,400	38,070	3,400	4,000	16,400	1,310	

*Nonregenerative. †Total includes figures converted from calendar-day to stream day.

KENTUCKY																
Ashland Petroleum—Catlettsburg	132,000	138,000	55,000	² 4,000	¹ 54,000	1,000	² 22,500				¹ 22,500 ² 9,000 ³ 3,000 ⁴ 1,500 ⁵ 3,500	¹ 6,000	¹ 4,000 ² 2,500 ³ 13,000 ⁴ 5 ⁵ 12,000		10,000	
Louisville	25,000	26,000	10,000		¹ 9,000	NR	² 3,000				² 3,000				3,500	
Somerset Refinery Inc.—Somerset	2,800	3,000														
Total	159,800	167,000	65,000	4,000	63,000	6,700	25,500				42,500	6,000	21,500		13,500	

*Coal-tar, light oil. †Cumene. Cat-cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

LOUISIANA																
Atlas Processing Co.—Shreveport	29,000	NR	600				10,000				¹ 10,000 ² 1,800 ³ 4,800	¹ 1,000				
Bayou State Oil Corp.—Hosston	3,500	NR	2,000	⁵ 1,500										1,250	500	
Calumet Refining Co.—Princeton	2,400	2,400	4,100								² 2,400			1,700	480	
Canal Refining Co.—Church Point, La.	2,500	2,600					¹ 1,500									
Cities Service Oil Co.—Lake Charles	268,000	NR	60,000	⁴ 28,000	¹ 125,000	20,000	² 46,000			¹ 6,000 ⁴ 30,000	¹ 46,000 ² 14,000 ¹ 19,000 ³ 3,000	¹ 33,000 ² 2,300 ¹ 4,600		7,000		1,000
Continental Oil Co.—Westlake	83,000	85,000	8,000	¹ 7,000 ⁴ 10,000	² 30,000	7,000	² 18,500									500
Cotton Valley Solvents Co.— Cotton Valley	7,750	8,000														
Evangeline Refining Co. Inc.— Jennings	4,300	4,000					600									
Exxon Co.—Baton Rouge	445,000	460,000	165,000	⁴ 45,000	¹ 160,000	NR	² 99,500	¹ 21,000			² 3,900 ⁵ 23,800 ⁶ 80,000 ⁷ 2,200	¹ 33,100		15,000	28,900	2,160

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Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Fresh feed	Recycle					Alkyl-ation	Aromatics-isomerization	Lubes	Asphalt	
Good Hope Refineries Inc.— Good Hope	29,450	NR					13,500			13,500					
Gulf Oil Co.—Alliance Refinery, Belle Chasse	180,400	186,000	55,000	16,000	78,000	NR	137,500		16,000	41,000	28,400	11,100			840
Venice	28,700	29,100					18,000	11,500	22,000	14,400		25,400			
Kerr McGee Corp.—Cotton Valley	7,500	8,000													
LaJet Inc.—St. James	NR	11,000													
Murphy Oil Corp.—Meraux	92,500	95,400	14,500		10,500	500	18,000			22,500	2,900				
Shell Oil Co.—Norco	240,000	250,000	90,000	18,000	95,000	2,000	18,000	28,000	25,000	26,000	14,100			6,000	900
Tenneco Oil Co.—Chalmette	NR	97,000	23,000	9,000	22,000	NR	23,500	18,000		24,000	5,000	7,000			350
Texaco Inc.—Convent	140,000	NR	35,000	12,000	70,000	NR	30,000			55,000	12,500				
Total†	1,666,600	1,733,180	461,090	147,830	598,280	130,830	362,930	78,500	99,000	403,410	138,290	23,500	48,450	35,880	5,250

*All figures are calendar day. Stream day figures not reported. †State totals include figures converted to calendar day or stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

MARYLAND

Amoco Oil Co.—Baltimore	10,000	NR													8,000
Chevron Asphalt Co.—Baltimore	13,500	NR	13,800												11,000
Total*	23,500	24,740	13,800												19,000

*State total includes figures converted to stream day basis.

MICHIGAN

Bay Refining-Dow Chemical USA—Bay City	17,000	NR			25,500	2,750					750				
Crystal Refining Co.—Carson City	6,200	NR	2,800												
Lakeside Refining Co.—Kalamazoo	6,000	NR					2,000								
Marathon Oil Co.—Detroit	58,000	64,000	25,000		21,500	3,900	16,000		12,500	16,500	3,500	2,000		8,650	
Osceola Refining Co.—West Branch	NR	9,500					1,350			2,200					
Total Leonard Inc.—Alma	40,850	43,000	17,000		11,000	NR	13,400		13,800	13,400	2,200			3,000	
							10,000		1,400						
Total*	137,080	147,230	44,800		38,000	9,950	32,750		17,700	31,100	5,450	2,000		11,650	

*State totals include figures converted to stream day or calendar day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

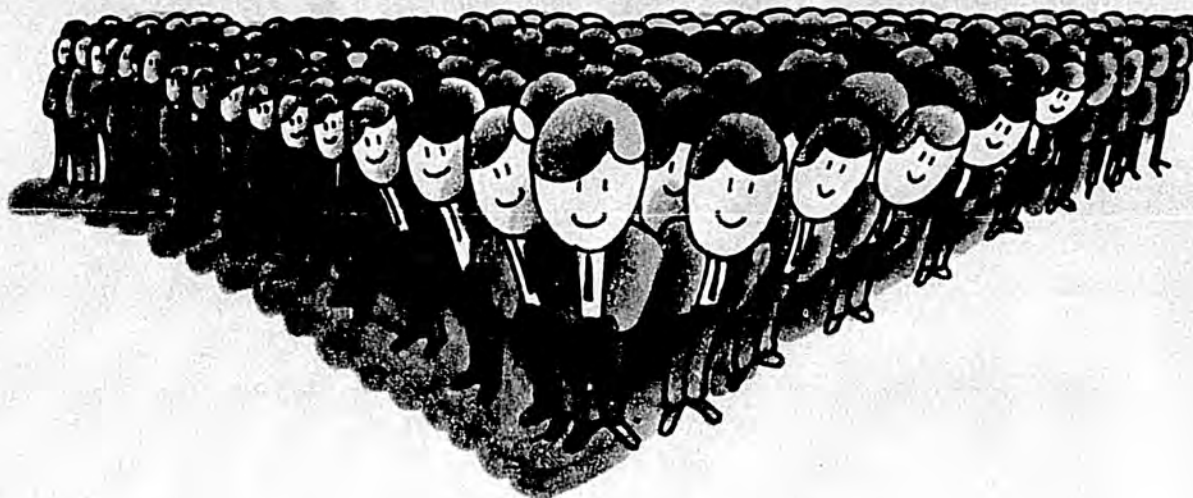
MINNESOTA

Continental Oil Co.—Wrenshall	23,500	24,000			18,500	1,000	23,600			13,600					
Koch Refining Co.—Pine Bend	106,920	110,000	40,000	23,000	22,500	500	16,500		7,000	16,500	18,500			20,000	1,300
					14,400	5,200				24,000					
										26,000					
Northwestern Refining Co., Division of Ashland Oil Inc.—St. Paul Park	60,000	64,000	38,000		20,000	1,500	10,000		20,000	10,000	3,000			22,000	
							5,000								
Total	190,420	198,990	78,000	23,000	65,400	8,200	30,100		27,000	65,100	11,500			42,000	1,300

MISSISSIPPI

Amerada-Hess Corp.—Furvis	28,500	30,000		6,700	14,500	NR	15,700	3,000		15,450					320
Southland Oil Co.—Crupp	4,200	3,200												1,440	

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Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Fresh feed	Recycle					Alkyl-tion	Aromatics-isomerization	Lubes	Asphalt	
Lumberton	6,000	4,263													
Sandersville	11,000	8,297	4,563												2,345
Standard Oil Co. of Kentucky*—Pascagoula	240,000	NR	148,000		156,000	2,000	265,000	159,000		136,000	19,200	16,000			3,485
Total	289,700	298,390	152,563	6,700	70,500	6,350	70,700	62,000		41,450	9,200	6,000		7,270	320

*Calendar day figure converted to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

MISSOURI

Amoco Oil Co.*—Sugar Creek	105,000	NR	40,000	11,000	138,000	12,000	14,000			118,000 27,000	15,000			6,500	450
Total	105,000	110,530	40,000	11,000	38,000	12,000	14,000			45,000	5,000			6,500	450

*Total includes figure converted from calendar day to stream day basis.

MONTANA

Big West Oil Co.—Kevin	5,123	5,500	750	1,200			1,000			1,000				325	
Cenex—Laurel	42,000	44,000	15,400		15,000	3,000	26,800			210,000 415,000	23,200	22,100			
Continental Oil Co.—Billings	52,500	56,000	12,200		14,000	7,000	25,500 10,500			39,000	23,800	22,600		3,500	
Exxon Co.—Billings	45,000	46,000	18,000	5,200	19,000	15,000	14,500	4,900		215,500 20,000	23,400			13,000	250
Jet Fuel Refinery—Mosby	1,000	NR													
Phillips Petroleum Co.—Great Falls	5,700	NR	2,000		1,800	1,200	2600			1700 1,000				800	
Tesoro Petroleum Corp.—Wolf Point	2,500	2,650													
Westco Refining Co.—Cut Bank	4,658	5,000		2,200			2950			11,200 1,000					
Total†	158,481	166,200	48,350	8,600	49,800	26,200	36,850	4,900		104,400	10,400	4,700		17,625	250

*Light oil. †State totals include calendar day figures converted to stream day basis.

NEBRASKA

CRA Inc.—Scottsbluff	5,000	5,500	2,000		2,000	600	1,000								
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NEW JERSEY

Amerada-Hess Corp.—Fort Reading	70,000	75,000	30,000		130,000	15,000	16,500			16,500	14,480				
Chevron Oil Co.—Perth Amboy	88,000	92,000	50,000		30,000	8,000	214,000			14,000	13,000			25,000	
Exxon Co.—Linden	275,000	286,000	143,000	2,200	120,000	20,000	42,000		50,000	20,000 14,000 39,000	18,500			46,000	
Mobil Oil Corp.—Paulsboro	98,000	100,500	62,600	23,700	25,000	NR	23,500			23,500 33,000	2,300		6,400		975
Texaco Inc.*—Westville	88,000	NR	29,500	13,000	40,000	NR	13,000			17,000 23,000	13,000				
Total†	619,000	646,131	318,380	40,340	249,440	63,830	100,440		50,000	236,450	21,610		6,400	71,000	975

*All figures are calendar day. Stream day figures not reported. †State total includes figures converted to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

Company and location	Crude capacity		Charge capacity—b/sd							Production capacity—b/sd				Coke (t/d)	
	b/cd	b/sd	Vacuum distillation	Thermal operations	Cat cracking		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkyl-ation	Aromatics-isomerization	Lubes		Asphalt
NEW MEXICO															
Caribou Four Corners Inc.—Kirtland	2,200	1,400													
Famariss Oil Corp.—Monument	5,000	NR					650								
Navajo Refining Co.—Artesia	20,930	NR	4,500	1,250	25,200	NR	1,870			12,200	2,400			1,400	
Plateau Inc.—Bloomfield	5,100	5,200					2,250			2,250					
Shell Oil Co.—Ciniza	20,000	21,000	8,000		17,000	3,500	17,000			27,000	2,700			840	
Thriftway Co.—Bloomfield	2,129	NR													
Total†	55,359	57,130	12,500	1,250	12,200	5,060	11,770			11,450	3,100			2,240	

†Total includes figures converted from calendar day to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

NEW YORK															
Ashland Petroleum Co.—Tonawanda	65,000	67,000	25,000	.....	20,000	NR	211,500	.....	20,000	12,000 *1,500	2,000	2,500	.....	10,000	.....
McBil Oil Corp.—Buffalo	42,600	44,000	18,000	.....	219,000	6,000	211,200	.....	.....	12,600	2,800	.....	.....	7,500	.....
Total	107,600	111,000	43,000	.....	39,000	12,000	22,700	.....	20,000	26,100	4,800	2,500	.....	17,500	.....

*Coal tar, light oil. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

NORTH DAKOTA															
Amoco Oil Co.—Mandan	48,000	NR	.....	.....	23,000	11,000	28,200	.....	.....	11,000	2,900	.....	.....	.....	.....
Westland Oil Co.—Williston	4,658	5,000	.....	1,100	.....	.....	2,000	.....	.....	1,600	.....	.....	.....	.....	.....
Total*	52,658	55,530	.....	1,100	23,000	11,000	10,200	.....	.....	12,600	2,900	.....	.....	.....	.....

*State total includes figure converted from calendar day to stream day basis.

OHIO															
Ashland Petroleum Co.—Canton	60,000	62,000	24,000	.....	22,000	NR	211,000	.....	20,000 *12,000	12,000	27,000	.....	.....	10,000	.....
Findlay (operated seasonally)	10,000	20,000	8,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,000	.....
Gulf Oil Co.—Cleveland	42,100	43,500	13,000	.....	18,000	9,000	10,000	.....	5,000	11,000	24,500	.....	.....	2,900	.....
Toledo	50,300	51,000	12,500	.....	20,000	2,000	11,000	.....	5,000	11,000	25,500	.....	.....	2,000	.....
Standard Oil Co. of Ohio—Lima	165,000	175,000	51,000	15,000	35,000	10,500	50,000	20,000	.....	59,000	.....	.....	2,100	.....	610
Toledo	120,000	125,000	43,000	12,800	55,000	16,500	47,700	36,000	.....	38,500	11,300	.....	.....	7,000	650
Sun Oil Co.—Toledo	125,000	130,000	22,000	.....	50,000	7,500	25,000	26,000	.....	27,500	17,000	.....	.....	.....	.....
							216,000	.....	.....	.....	.....	.....	.....	.....	.....
Total	572,000	606,500	173,500	27,800	200,000	52,100	170,700	82,000	42,000	159,000	35,300	.....	2,100	27,900	1,260

Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

OKLAHOMA															
Allied Materials Corp.—Stroud	5,500	5,800	2,800	.....	.....	.....	.....	.....	.....	1,000	2,350	.....	900	1,210	.....
Apco Oil Corp.—Cyril	12,000	12,500	5,000	.....	16,000	1,500	1,000	.....	.....	.....	.....	.....	.....	1,300	.....
Champlin Petroleum Co.—Enid	49,500	52,000	18,000	43,700	19,500	1,950	215,000	.....	.....	20,400	24,500	6,000	1,100	1,400	165
Continental Oil Co.—Ponca City	117,000	120,000	34,500	13,500	44,600	NR	231,300	.....	.....	32,800	29,700	45,000	2,300	3,000	500
				18,500	.....	.....	.....	.....	.....	27,700*	.....	.....	.....	.....	.....
Kerr-McGee Corp.—Wynnewood	32,000	34,000	10,000	.....	11,500	2,000	27,500	14,500	.....	17,500	.....	.....	.....	3,500	.....
									.....	24,000†	.....	.....	.....	.....	.....
Midland Cooperatives Inc.—Cushing	19,000	19,814	7,000	4,000	17,000	3,000	14,500			14,500	2,000				80
										22,000					
										31,000					
										41,000					

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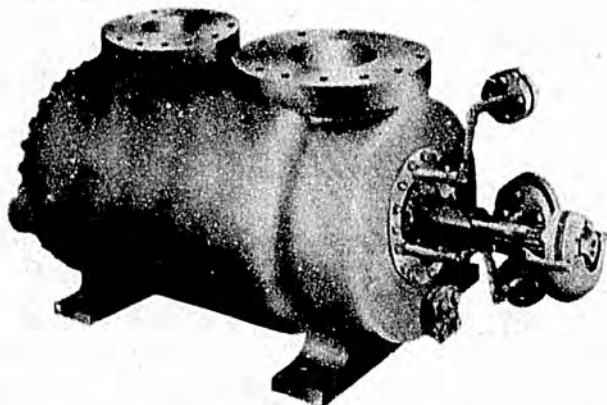
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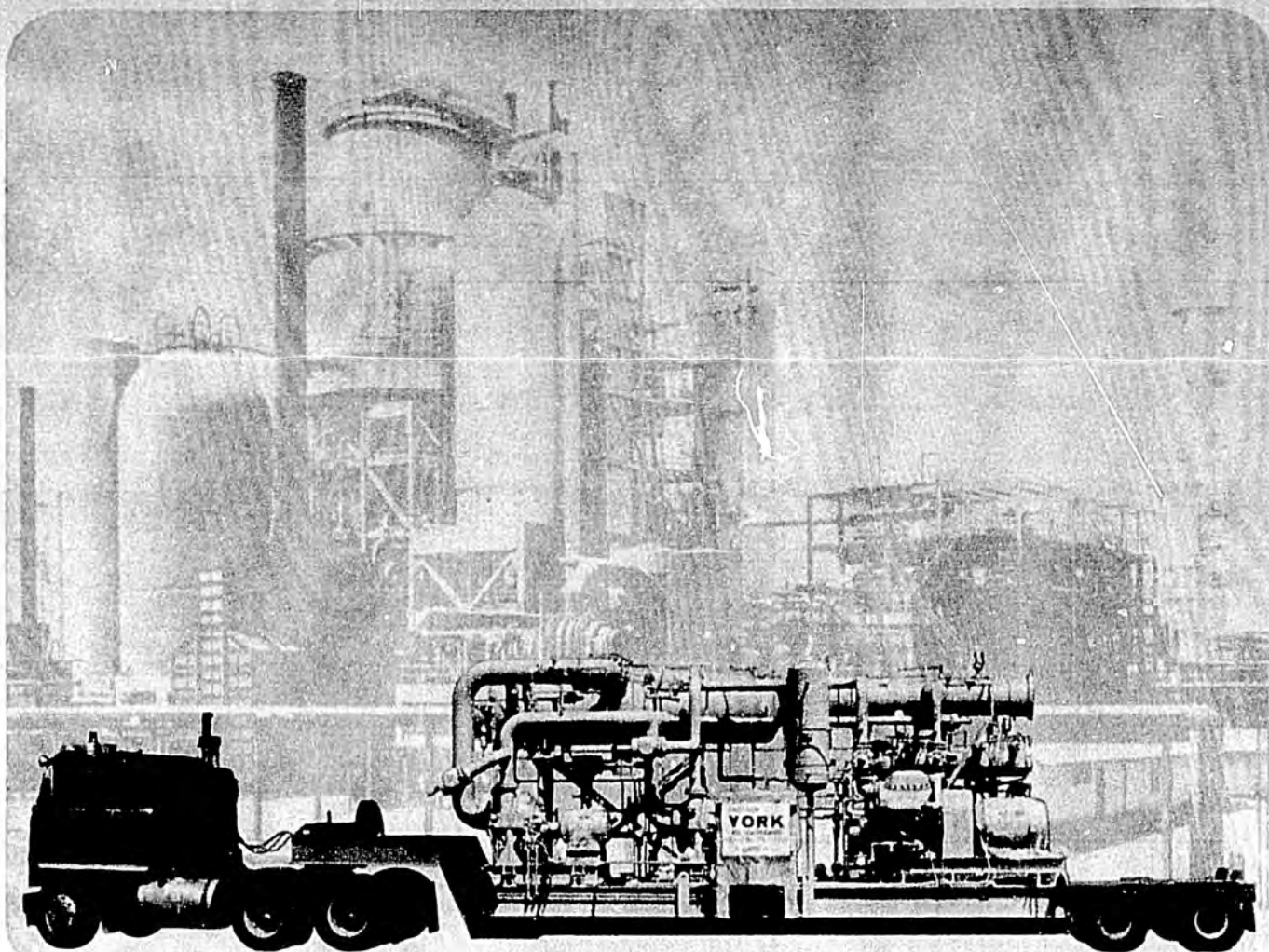
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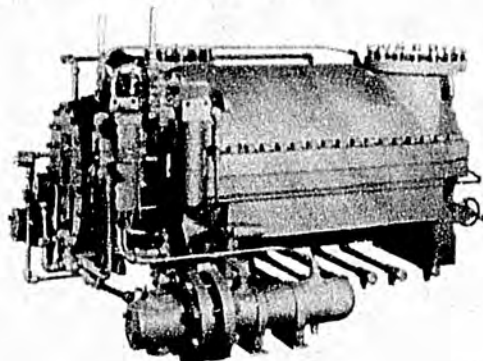


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YORK DIVISION OF BORG-WARNER CORPORATION
BORG WARNER

P. O. BOX 1592, YORK, PENNSYLVANIA 17405

Company and location	Crude capacity—b/sd		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Cat cracking Fresh feed	Recycle					Alkyl-ation	Aromatics-isomerization	Lubes	Asphalt	
OKC Refining Inc.—Okmulgee	21,500	NR	3,200		² 8,000	2,000					² 1,500			1,400	
Sun Oil Co.—Duncan	48,500	50,000	17,000	⁴ 12,000	¹ 25,000	10,500	² 7,800			¹ 7,800	² 5,800				400
Tulsa	88,500	90,000	31,500	⁴ 8,200	¹ 30,000	1,400	² 23,000			¹ 28,000	² 2,600	¹ 2,000	6,300	4,200	300
							² 7,000			² 6,500	² 6,000	² 950			
												⁴ 2,100			
Texaco Inc.†—West Tulsa	50,000	NR	14,500	¹ 6,000	¹ 18,000	NR	² 8,000			¹ 8,000	¹ 3,000	⁴ 500			
Tonkawa Refining Co.—Tonkawa	6,000	NR													
Vickers Petroleum Corp.—Ardmore	31,500	32,000	11,000	² 2,500	¹ 12,500	500	² 6,500			¹ 6,500	² 4,500			5,000	
Total††	481,000	497,695	156,110	69,070	184,100	42,230	112,490	4,500		136,590	41,280	16,610	10,600	21,010	1,445

*Cycle oil. †Cat charge. ‡All figures calendar day. Stream day figures not reported. \$Pitch. ††Total includes figures converted to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

OREGON

Standard Oil Co. of California*—Portland	14,000	NR	15,000											8,600	
Total	14,000	14,740	15,000											8,600	

*Calendar day figure converted to stream day basis.

PENNSYLVANIA

Atlantic Richfield Co.—Philadelphia	185,000	195,000	57,000				¹ 60,000	¹ 30,000	² 32,000	¹ 54,000				19,500	
									⁴ 41,000						
BP Oil Corp.—Marcus Hook	98,000	105,000	60,000	² 12,000	¹ 37,900	4,000	² 22,000			¹ 24,000	² 9,700				
										⁴ 16,000					
Bradford Petroleum Division, Witco Chemical Corp.—Bradford	7,000	7,800					² 5,500			¹ 2,000			3,100		
Gulf Oil Co.—Philadelphia	168,500	174,000	65,000		¹ 74,000	6,500	¹ 32,000		² 60,000	¹ 52,000	² 15,000	¹ 3,300			
												² 1,600			
Pennzoil Co.—Rouseville	10,000	10,400	3,328				¹ 3,600	² 2,700		¹ 4,500			3,528		
Quaker State Oil Refining Corp.—Emlenton	3,320	3,495	1,700	¹ 750			² 1,250			¹ 1,450			1,700		
				⁵ 600											
Farmers Valley	6,500	6,800	2,750	¹ 1,400			² 1,858			¹ 2,300			2,500		
Sun Oil Co.—Marcus Hook	165,000	180,900	48,000	² 12,000*	¹ 75,000	10,000	¹ 17,400			¹ 35,000	¹ 12,000	¹ 53,000	17,000	12,000	
							² 27,600			⁵ 10,000					
										¹ 10,000					
United Refining Co.—Warren	38,000	38,000	8,000		¹ 10,000	200	² 10,000			¹ 15,000	¹ 1,400			4,000	
										⁴ 1,500					
Valvoline Oil Co., Division of Ashland Oil Inc.—Freedom	¹ 6,200	6,500	2,000										1,300		
Wolf's Head Oil Refining Division of Pennzoil Co.—Reno	2,100	2,220											500		
Total	689,620	729,215	247,778	26,750	196,900	20,700	197,208	32,700	133,000	227,750	38,100	57,900	29,628	35,500	

*Naphtha standby. †Furnace oil.

TENNESSEE

Delta Refining Co.—Memphis	29,000	30,000			² 12,000	None					² 3,500			3,000	
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Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd				Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Cat cracking Fresh feed	Recycle	Cat reforming	Alkyla-tion				Aromatics-isomerization	Lubes	Asphalt		
TEXAS																
Adobe Refining Co. (subsidiary of Crystal Oil Co.)—LaBlanca	4,250	5,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
American Petrofina Inc.—Mt. Pleasant	26,000	NR	15,000	.....	² 9,600	2,200	¹ 3,000	.....	⁵ 6,000	² 3,500	² 2,200	.....	.....	8,000	.....	
Port Arthur	84,000	NR	28,000	² 10,000	¹ 26,000	2,000	¹ 12,500	.....	⁵ 30,000	¹ 15,000	¹ 2,500	¹ 3,000	.....	.....	.....	
Amoco Oil Co.—Texas City	333,000	NR	131,000	⁴ 22,500	¹ 128,500	56,500	³ 129,000	¹ 38,000	.....	¹ 130,000	¹ 26,700	¹ 34,000	.....	5,300	800	
Atlantic Richfield Co.—Houston	213,000	233,500	70,000	⁴ 27,000	¹ 69,000	5,000	¹ 100,000	³ 4,500	⁵ 35,000	¹ 100,000	¹ 9,000	¹ 10,400	6,500	.....	1,300	
										⁶ 6,000 ⁸ 8,000						
Champlin Petroleum Co.—Corpus Christi	62,000	63,000	9,200	.....	¹ 10,000	105	² 6,300 ⁶ 20,000*	.....	.....	¹ 27,000 ² 6,100	² 2,600	¹ 2,100 ² 1,600 ⁶ 7,510	.....	.....	.....	
Charter International Oil Co.—Houston	70,000	66,000	22,000	² 10,000	¹ 24,000	5,000	¹ 13,500	.....	⁵ 29,500	¹ 15,000	¹ 4,500	¹ 7,900	.....	4,000	.....	
Chevron Oil Co.—El Paso	71,000	NR	24,600	.....	¹ 22,000	8,000	² 25,000	.....	⁴ 14,000 ⁵ 4,000	¹ 25,000	¹ 5,000	⁴ 1,500	.....	5,000	.....	
Coastal States Petrochemical Co.—Corpus Christi	NR	135,000	33,000	⁴ 12,000	¹ 19,000	300	¹ 15,000 ⁶ 20,000*	.....	.....	¹ 30,000 ² 10,000† ⁷ 10,000† ² 25,000‡	² 2,500	¹ 5,500 ² 2,300	.....	500	500	
Cosden Oil & Chemical Co.—Big Spring	65,000	NR	25,000	¹ 10,000	¹ 24,000	1,000	² 20,000	.....	⁵ 8,000	¹ 25,000	² 6,000	¹ 4,500 ² 2,000 ³ 800	.....	8,000	.....	
Crown Central Petroleum Corp.—Houston	100,000	103,000	38,000	⁴ 9,500	¹ 43,000	9,000	¹ 8,000 ² 14,000	.....	.....	¹ 22,000	² 10,000	¹ 2,000 ² 2,000	.....	.....	300	
Diamond Shamrock Oil & Gas Co.—Sunray	47,000	49,000	14,500	¹ 2,500	² 11,500 ³ 11,500	2,000	² 14,000	.....	.....	¹ 14,000 ² 2,500 ³ 3,500†	¹ 7,600	⁴ 1,400	.....	2,500	.....	
Eddy Refining Co.—Houston	3,250	NR	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Exxon Co.—Baytown	400,000	420,000	180,000	.....	¹ 124,000	21,000	³ 88,000	¹ 20,000	² 48,000	¹ 90,000 ² 15,000 ⁵ 41,000 ⁶ 109,000 ⁷ 8,500††	¹ 26,000	.....	25,000	12,000	.....	
Flint Chemical Co.—San Antonio	1,200	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Gulf Oil Co.—Port Arthur	312,100	319,000	147,400	⁴ 30,000	¹ 120,000	6,000	¹ 65,000	¹ 15,000	⁵ 65,000	¹ 65,000 ³ 1,200 ⁵ 13,900	¹ 5,500 ² 14,500	¹ 2,700 ² 2,500 ⁵ 7,200	¹ 13,200	.....	1,390	
Howell Hydrocarbons—San Antonio	3,100	NR	.....	.....	.....	.....	¹ 500	.....	.....	.....	.....	.....	.....	.....	.....	
La Gloria Oil & Gas Co.—Tyler	28,000	29,000	.....	¹ 3,000 ⁴ 12,000	¹ 10,000	5,000	² 9,500	.....	.....	¹ 7,000	¹ 2,400	.....	.....	.....	80	
Longview Refining Co. (subsidiary of Crystal Oil Co.)—Longview	6,600	7,500	.....	.....	.....	.....	¹ 1,500	.....	.....	¹ 3,300	.....	.....	.....	.....	.....	
Marathon Oil Co.—Texas City	61,000	63,000	20,000	.....	¹ 28,500	4,500	¹ 8,000	.....	.....	.....	¹ 1,650	¹ 1,600	.....	.....	.....	
Mobil Oil Corp.—Beaumont	325,000	335,000	103,000	⁴ 33,000	¹ 55,000 ² 40,000	NR 12,000	¹ 45,000 ² 49,000	¹ 29,000	.....	¹ 83,000 ⁶ 42,000	¹ 16,500	.....	8,800	100	1,200	
Phillips Petroleum Co.—Borger	95,000	NR	.....	.....	¹ 55,000	15,000	¹ 26,000	.....	.....	¹ 25,000 ⁴ 26,000 ⁷ 12,000	¹ 14,500	² 2,900 ⁴ 8,000 ⁵ 12,000	.....	.....	.....	

Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd			Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Fresh feed	Cat cracking—Recycle	Cat reforming				Alkylation	Aromatics-isomerization	Lubes	Asphalt	
Sweeny	85,000	NR	17,000		¹ 30,000	5,000	¹ 32,000			¹ 26,000	² 9,000	¹ 1,900 ³ 3,600 ⁴ 9,000			
Pride Refining Inc.—Abilene	14,125	14,690													
Quintana-Howell—Corpus Christi	10,000	NR													
Shell Oil Co.—Deer Park	288,000	293,000	106,400	¹ 65,000 ⁴ 20,000	¹ 70,000	NR	¹ 35,000 ³ 42,000	¹ 25,000	⁴ 50,000	² 73,000 ⁵ 7,000 ⁶ 85,000 ² 9,700	¹ 6,800	¹ 13,500	6,000	3,800	
Odessa	32,000	34,000	10,000		¹ 10,500	5,000	¹ 9,700					¹ 2,800	¹ 450		
Southwestern Oil & Refining Co.—Corpus Christi	100,000	150,000	24,000		¹ 9,500	2,500	² 15,000			¹ 15,000	² 4,000	¹ 6,000			
Suntide Refining Co.—Corpus Christi	57,000	60,000	10,000	⁴ 7,700	¹ 20,000	6,500	¹ 13,000 ³ 11,000			¹ 15,500	³ 2,200	¹ 4,500 ² 1,300			235
Tesoro Petroleum Corp.—Carrizo Springs	13,000	13,500													
Texaco Inc.—Amarillo	20,000	NR		⁴ 4,000	¹ 8,000		² 5,000			¹ 5,000	¹ 1,500				100
El Paso	17,000	NR		⁴ 4,000	¹ 7,000	NR	² 3,500			¹ 3,500	¹ 1,500	⁴ 500			100
Port Arthur	406,000	NR	142,000	¹ 51,000	¹ 135,000	NR	¹ 20,000 ² 40,000	¹ 15,000		¹ 60,000 ² 37,000**	¹ 15,000		20,000		
Port Neches	47,000	NR	26,000											9,000	
Texas Asphalt & Refining Co.—Fort Worth	3,000	3,500													
Texas City Refining Inc.—Texas City	60,000	63,000	14,500	² 5,000	² 22,000	1,000	² 11,000			¹ 11,000	³ 3,500				
Three Rivers Refinery—Three Rivers	1,500	NR	800										800	120	
Union Oil Co. of California—Nederland	116,000	NR	44,000		¹ 36,700	4,000	³ 35,000			¹ 35,000 ² 6,500 ⁴ 6,700	¹ 4,000	¹ 2,500 ² 1,800	3,500	5,400	
Union Texas Petroleum, Division Allied Chemical Corp.—Winnie	9,500	10,000					¹ 6,200	² 3,000		² 270 ² 250†		¹ 300			
Winston Refining Co.—Ft Worth	15,000	15,500	3,500		¹ 3,400	2,600	¹ 1,700								
Total††	3,732,875	3,896,560	1,277,560	344,750	1,199,370	268,535	980,510	151,170	289,500	1,427,650	211,160	172,410	86,020	64,720	6,025

*Continuous. †Kerosine. ‡Diesel. §Gas oil. ¶Solvents. ||All figures are calendar day. Stream day figures not reported. **Jet fuel. ††State totals includes figures converted to stream day or calendar day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

UTAH

Amoco Oil Co.—Salt Lake City	39,000	NR			¹ 17,000	5,000	² 5,500					¹ 5,500	¹ 3,750	⁴ 1,800		2,500	
Arizona Fuels Corp.—Roosevelt	NR	11,000			¹ 6,000	None											
Caribou Four Corners Inc.—Woods Cross	4,200	5,000	1,000				¹ 2,000		¹ 1,000								
Chevron Oil Co.—Salt Lake City	45,000	NR	27,000		¹ 10,000 ³ 8,000	2,000 5,000	² 5,500			⁴ 5,500	¹ 5,500	² 4,300	⁴ 750				
Husky Oil Co.—North Salt Lake	11,500	12,000	3,800		² 4,400	2,500	¹ 1,000					¹ 1,000	² 800				
Phillips Petroleum Co.—Woods Cross	23,000	NR	3,000		² 8,000	2,500	¹ 4,500			⁴ 1,500	² 1,600					2,200	
Total*	133,150	140,620	34,800		53,400	17,000	18,500	1,000	7,000	13,600	8,850	2,550				4,700	

*State totals include figures converted to stream day or calendar day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

VIRGINIA

Amoco Oil Co.—Yorktown	53,000	NR	28,000	⁴ 14,000	¹ 26,500	4,000	³ 8,000					¹ 8,000 ⁴ 14,000					710
Total	53,000	55,790	28,000	14,000	26,500	4,000	8,000					22,000					710

Calendar day figure converted to stream day basis.

Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd					Production capacity—b/sd				Coke (t/d)	
	b/cd	b/sd			Cat cracking—Fresh feed	Recycle	Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Alkyl-ation	Aromatics-isomerization	Lubes		Asphalt
WASHINGTON															
Atlantic Richfield Co.—Ferndale	96,000	100,000	55,000	29,000			235,000	35,000	12,000	27,000					1,500
Mobil Oil Corp.—Ferndale	71,500	74,500	7,000	7,000	25,500	2,000	210,000			10,000	5,900				
										21,000					
Shell Oil Co.—Anacortes	91,000	94,000	33,000		36,000	17,000	20,000		8,500	24,000	12,100	2,900			
										21,000					
Sound Refining Inc.—Tacoma	4,500	4,700	4,500										1,900	2,600	
Standard Oil Co. of California— Richmond Beach	4,500	NR	5,000											4,000	
Texaco Inc.*—Anacortes	63,000	NR	22,500		25,000	NR	8,000			25,000	3,000				
U.S. Oil & Refining Co.—Tacoma	16,000	NR	3,200				3,000			3,000				3,000	
Total	346,500	361,100	132,700	36,000	89,280	27,330	76,890	35,000	20,500	133,780	21,330	2,900	1,900	9,600	1,500

*All figures are calendar day. Stream day figures not reported. †State totals include calendar day figures converted to stream day basis. Cat cracking recycle total includes figures not reported (with recycle estimated at 30% of fresh feed).

WEST VIRGINIA

Pennzoil Company, Elk Refining Division—Falling Rock	5,000	5,500	2,500				2,000			2,500			1,300		
										500					
Quaker State Oil Refining Corp.—Newell	9,700	10,000	4,000				2,860		4,440	3,060			3,600		
St. Mary's	4,850	5,000	2,175				1,300			1,450			1,700		
Total	19,550	20,500	8,675				6,160		4,440	7,510			6,600		

WISCONSIN

Murphy Oil Corp.—Superior	37,000	38,000	15,500		9,700	1,000	28,200		5,800	8,200	2,200			12,000	
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WYOMING

Amoco Oil Co.—Casper	43,000	NR	13,500		9,500	1,500	25,200			6,600	1,150		1,280	1,550	
Husky Oil Co.—Cheyenne	23,600	24,600	14,000		10,000	2,500	1,000			6,200	2,750	1,500		3,000	
							25,200			1,500					
										3,400					
Cody	10,700	11,200	6,500		3,300	1,000	1,200			1,800	800			4,000	
Little America Refining Co.—Casper	22,000	23,000	5,800		6,500	4,000	3,750			3,750				2,000	
										3,750					
Mountaineer Refining Co. Inc.—LaBarge	NR	500													
Pasco Inc.—Sinclair	40,000	42,000	14,200		12,000	840	9,700		11,000	9,700	2,200			2,300	
										11,400					
Sage Creek Refining Co.—Cowley	1,000	1,200					500								
Southwestern Refining Co.—LaBarge	330	NR													
Tesoro Petroleum Corp.—Newcastle	10,500	11,000			3,750	4,250					900				
Texaco Inc.*—Casper	21,000	NR	10,000	4,000†	7,000	NR	2,400		4,000	4,000				1,500	125
Total†	172,605	181,210	65,110	4,440	52,830	16,420	30,990		15,440	52,540	7,800	1,500	1,280	14,520	140

*All figures are calendar day. Stream-day figures not reported. †Pressure coke. ‡State totals include figures converted to calendar day or stream day basis. Cat cracking recycle total figures not reported (with recycle estimated at 30% of fresh feed).

Survey of Canadian operating refineries*

Province	No. plants	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd		Cat reforming	Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
		b/cd	b/sd			Fresh feed	Recycle					Alkylolation	Aromatics-isomerization	Lubes	Asphalt	
Alberta	8	176,850	190,600	67,280	9,400	56,330	25,807	28,290		6,000	64,740	14,560	3,000	3,220	10,680	1,613
British Columbia	7	133,900	141,200	53,530		40,170	15,350	27,410		19,450	49,450	2,510			8,250	
Manitoba	2	49,000	51,580	16,220		16,670	3,320	12,000	1,550		13,670	1,550			4,440	
New Brunswick	1	123,500	130,000	20,000		18,000	5,400	13,500		15,000	13,500				5,000	
Newfoundland	2	118,000	124,330	39,000	18,000			25,300	35,000		41,800					
Northwest Territories	1	2,900	3,050													
Nova Scotia	3	180,000	192,260	53,440		29,340	20,330	21,220			70,330				7,440	
Ontario	7	419,700	455,080	139,100	38,280	119,770	40,870	109,710	20,000	4,000	221,580	19,050	3,560	7,770	17,100	
Quebec	7	607,500	641,830	272,340	74,330	142,000	54,830	99,220	28,780	15,000	249,430	5,498	22,210	3,490	53,750	100
Saskatchewan	4	66,200	71,600	30,905	3,000	21,220	19,280	6,780			9,000				3,905	165
Total	42	1,877,550	2,001,530	691,815	143,010	443,500	185,187	343,430	85,330	59,450	733,500	43,168	28,770	14,480	110,565	1,878

*Province totals include figures converted to calendar day or stream day basis.

Company and location	Crude capacity		Vacuum distillation	Thermal operations	Charge capacity—b/sd				Cat hydro-cracking	Cat hydro-refining	Cat hydro-treating	Production capacity—b/sd				Coke (t/d)
	b/cd	b/sd			Fresh feed	Recycle	Cat reforming	Alkylolation				Aromatics-isomerization	Lubes	Asphalt		
ALBERTA																
Great Canadian Oil Sands Ltd.*— Fort McMurray	50,000	NR	.....	80,000	.....	.....	² 40,000 ² 14,000	² 16,000	.....	.....	.....	.....	.....	.....	2,800	
Gulf Oil Canada Ltd.—Calgary	6,750	7,500	2,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Edmonton	72,000	80,000	24,400	47,200	130,000	750	15,400 ² 10,000	.....	6,000	.....	45,000	² 10,000	3,000	.....	431	
Husky Oil Operations Ltd.— Lloydminster	10,600	11,000	6,500	.....	.....	.....	1,000	.....	.....	1,000	.....	.....	.....	5,200	.....	
Imperial Oil Enterprises Ltd.†— Calgary	22,600	NR	7,400	.....	17,000	11,600	2,500 ² 2,600	.....	.....	45,600 ² 2,900	1,700 ² 2,400	.....	.....	.....	1,000	
Edmonton	39,900	NR	15,600	.....	110,200	9,000	2,600 ² 2,600	.....	.....	2,900 ² 2,700	.....	.....	2,900	3,400	.....	
Shell Canada Ltd.†—Bowden	5,000	NR	.....	.....	.....	.....	2,600 ² 3,000	.....	.....	.....	.....	.....	.....	.....	.....	
Texaco Canada Ltd.†—Edmonton	20,000	NR	7,500	42,000	16,500	NR	3,000	.....	.....	3,000 ² 2,700	.....	.....	.....	.....	65	
Total	176,850	190,600	67,280	9,400	56,330	25,807	28,290	.....	6,000	64,740	14,560	3,000	3,220	10,680	1,613	

*Synthetic crude. Not included in totals. †All figures calendar day. Stream day figures not reported. ‡Province totals include figures converted to stream day basis.

BRITISH COLUMBIA																
Chevron Canada Ltd.—North Burnaby	20,000	21,000	8,400		15,000	4,000	² 3,400									
Gulf Oil Canada Ltd.—Kamloops	5,900	6,500	2,200		² 2,100	200	² 1,800			² 2,400					500	
Port Moody	30,000	32,000	12,500		² 9,000	2,300	² 1,000			² 2,250						
Imperial Oil Enterprises Ltd.—loco	36,800	NR	16,200		² 11,700	5,900	² 4,000			² 11,700	² 1,050				300	
Pacific Petroleum Ltd.—Taylor	11,700	12,000	1,100		² 4,400	300	² 2,200			² 4,500					2,800	
							² 6,400			² 2,200	² 1,460				560	
							² 2,400			² 2,400						
Shell Canada Ltd.—Shellburn	22,000	NR	7,500		² 6,000	NR	² 2,700		² 6,000	² 11,500					2,500	

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PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.

Total wells drilled in the United States*—May 1974†

Data compiled by the American Petroleum Institute

State-district	Total wells excluding service wells, stratigraphic, and core tests					Total wells all types, May 1974‡		Total exploratory wells§				
	Oil wells‡	Gas wells§	Dry holes	Wells	Footage	Wells	Footage	Oil wells‡	Gas wells§	Dry holes	Wells	Footage
Alabama	1	3	3	7	89,282	7	89,282	1	1	3	5	58,089
Arkansas	5	4	12	21	118,112	22	120,195			4	4	24,512
California	115	3	24	142	348,455	159	387,987	4	2	12	18	99,734
North	1	3	4	8	42,140	10	53,128		2	2	4	13,727
Central Coastal	13		4	17	80,487	19	69,854	2		3	5	21,170
East Central	91		13	104	216,470	114	230,571	2		7	9	59,837
South	7		3	10	25,540	12	31,645					
Offshore	3			3	1,818	4	2,789					
Colorado	23	13	38	74	402,991	74	402,991	1	4	23	28	143,916
Florida	3		6	9	117,025	9	117,025	1		4	5	54,711
Illinois	22		24	48	113,606	48	117,347			7	7	18,493
Indiana	4	1	22	27	38,086	30	44,361	1	1	15	17	23,892
Kansas	80	53	112	245	895,035	261	712,508	5	2	61	68	238,209
Kentucky	11	8	35	54	79,122	55	80,385	2	2	15	19	29,056
Louisiana	64	53	84	201	1,541,568	202	1,554,188	1	8	30	39	368,349
North	26	18	29	73	270,177	73	270,177	7	4	9	14	73,822
South	14	13	26	53	540,128	53	540,128		4	13	17	225,045
Offshore	24	22	29	75	731,263	76	743,883			8	8	69,482
Maryland		1		1	5,120	1	5,120		1		1	5,120
Michigan	3	2	10	15	70,720	16	74,858	1	1	6	8	36,695
Mississippi	4		28	32	266,574	32	266,574			25	25	204,221
Missouri			1	1	795	1	795			1	1	795
Montana	3	2	22	27	79,323	27	79,323		1	13	14	52,805
Nebraska		1	8	9	43,934	9	43,934		1	8	9	43,934
New Mexico	19	39	31	89	470,517	91	475,700	1	3	14	18	99,899
East	18	13	23	54	330,466	56	335,649	1	3	11	15	96,517
West	1	26	8	35	140,051	35	140,051			3	3	3,382
New York	12			12	12,935	12	12,935					
North Carolina			1	1	4,102	1	4,102			1	1	4,102
North Dakota	2		2	4	34,702	5	42,637			1	1	8,302
Ohio	52	88	9	149	662,048	149	662,048	6	13	3	22	109,399
Oklahoma	92	43	80	215	1,223,617	227	1,253,496	3	1	22	26	187,468
Pennsylvania	40	33	5	78	178,679	84	187,863		2	3	5	26,028
Tennessee	4	1	4	9	17,751	9	17,751		1	4	5	11,701
Texas	363	149	275	787	4,281,911	802	4,346,649	27	42	196	265	1,764,819
Dist. 1	28	4	18	50	170,716	50	170,716		1	15	16	73,283
Dist. 2	5	30	21	58	335,070	56	333,070	2	11	14	27	174,261
Dist. 3	29	19	36	84	562,994	84	562,994	4	13	28	45	377,829
Dist. 4	23	29	33	85	507,737	85	507,737		7	24	31	197,828
Dist. 5	2	1	6	9	45,137	12	54,038		1	6	7	35,523
Dist. 6	7	8	10	25	194,201	25	194,201	1		7	8	66,346
Dist. 7B	44	18	56	118	397,443	121	408,562	2		32	34	133,207
Dist. 7C	20	16	13	49	298,132	49	298,132		1	8	9	73,111
Dist. 8	93	6	9	108	720,807	112	743,724	3	1	7	11	115,161
Dist. 8A	55		20	75	409,555	80	431,356	7		15	22	148,431
Dist. 9	38	3	25	66	214,845	66	214,845	8	3	14	25	127,975
Dist. 10	19	10	7	36	216,140	36	216,140			5	5	37,380
Offshore		5	21	26	211,134	26	211,134		4	21	25	204,484
Utah	15		5	20	166,128	20	186,128			4	4	30,658
Virginia		1	1	2	10,320	2	10,320			1	1	5,170
West Virginia	5	18	4	27	86,163	27	86,163	1	1	3	5	22,474
Wyoming	15	4	24	43	282,974	43	282,974	3	3	16	22	176,320
Total—May 1974	357	520	870	2,347	11,459,595	2,425	11,665,639	58	90	495	643	3,848,877
Total—April 1974	947	700	945	2,592	13,349,007	2,681	13,554,973	64	94	523	681	4,154,125
Cum. 1974	4,504	3,035	4,437	11,976	60,204,842	12,383	61,175,662	295	451	2,589	3,335	20,007,441
Cum. 1973	3,936	2,293	3,997	10,226	54,149,907	10,623	55,192,960	294	284	2,255	2,783	—

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from Apr. 27, 1974 through May 24, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests, and outpost (extension) tests. ††Includes two strat tests and 76 service wells, 1,697 and 204,347 ft, respectively.

VENEZUELA

CREOLE Petroleum Corp. (Exxon Corp. subsidiary) has found oil below 15,000 ft in the Cretaceous in Urdaneta field in the western portion of Lake Maracaibo, Venezuela. The oil is 27° gravity, much lighter than the 11° gravity oil found in the field's shallower (about 10,000-ft) wells.

ALBERTA

A NEW wildcat gas discovery for West Central Alberta in Canada was reported recently by Sundance Oil Co.

The Dunvegan 10-18-82-5w6 well flowed 5,488 Mcfd through 1/2-in. choke in the Cadomin formation at 3,028-59 ft. Flow was 1,500 Mcfd in the Galata formation at 4,732-54 ft. Production casing was run to total plug-back depth of 4,953 ft for completion.

This step-out success is 175 miles northwest of Edmonton and 2 1/4 miles from Sundance's Dunvegan 6-6-82-5w6, a December 1973 strike.

ARKANSAS

FLOW of 120 b/d is reported at a new deep discovery in South Arkansas' Troy field.

C. G. Davis 1 Christopher et al., SW SW 2-24s-20w, Nevada County, flowed from perforations at 4,688-96 ft. This well is 1 3/4 miles southeast of Young and 1/4 mile northwest of the deep discovery at Troy. Other development is under way here.

In Lafayette County, Amerada Hess Corp. will drill to 11,500 ft, 2 1/2 miles southwest of Bradley. The 1 Charles G. Allen will drill in SW SW 21-19s-25w, 1 3/4 miles southwest of shallow production.

KANSAS

A REVIVAL well in McPherson County, Kan., opened Mississippian production in dry Bitkofer North field, 2 1/2 miles southeast of Canton.

Mid-America Petroleum Co. 1 Sinclair, NW NW SW 25-19s-1w, flowed 240 b/d on 1/2-in. choke from perforations at 2,946-54 ft.

OKLAHOMA

ARKLA Exploration Co. is busy developing gas reserves in the deep Anadarko basin of western Oklahoma.

The 1-3 Klein in Anthon field, Custer County, flowed 2,800 Mcfd from

Morrow Pennsylvanian through perforations at 12,971-78 ft. In Ellis County, the 1-2 Jones flowed 1,600 Mcfd from Morrow at 8,968-80 ft. The 1-34 Hutton in Taloga field, Dewey County, flowed 336 bbl oil daily from Morrow at 9,505-11 and 9,521-25 ft.

ANOTHER deep wildcat well dug in western Oklahoma's Anadarko basin.

Target for Forest Oil Corp. 1 Bobwhite unit is 23,000 ft. Well is 3 1/2 miles north of Northeast Gotebo gas field and 6 miles from 400-ft Hunton pay in ultrashallow Komalty District field, Kiowa County. The Washita County test is in NW SW NE SW 16-8n-16w. This site is at the "front door" of the deep trough of the basin.

DISCOVERIES

NEW MEXICO

Eddy County:

Samedan Oil Corp. 1 Amoco Federal, 16s-28e. Section 19. IPCAOF 3,935 Mcfd, GOR 51,099:1, Morrow Pennsylvanian 9,326-36 ft. SIWHP 2,528 psi, SIBHP 5,217 psi. TD 9,390 ft. Elev. 3,556 ft. GRD. Comp. 4-2-74. Contractor Capitan. New gas discovery.

NORTH DAKOTA

Stark County:

Farmer Union Exchange 6-30 William Tomchuck, SE NW 30-140n-98w. IPF 176 b/d, 18/64-in. choke, natural, Tyler 8,114-26 ft. TD 8,325 ft. Elev. 2,560 ft. KB. Comp. 4-25-74. Contractor Bomac. Tyler discovery, new field.

OKLAHOMA

Blaine County:

Southeast Longdale discovery. Universal Resources 1-20 Boston, C NE 20-19n-12w. IPF 25 b/d, 14/64-in. choke, 4,768 Mcfd, Mississippi and Chester 8,072-8,107 and 8,874-9,089 ft. Comp. 3-13-74.

Dewey County:

Southeast Huemac field. Wessely Energy 1 Blaine unit, C NE NE 11-17n-15w. IPF 42 b/d, 62,000 cfd, Morrow 9,632-42 ft. Comp. 3-25-74.

East Huemac field. Woods Petroleum Co. 1 Chain Ranch trust, C N 1/2 SW 6-18n-14w. IPF 379 b/d, 14/64-in. choke, 1,316 Mcfd, Morrow open hole 9,066-92 ft. Comp. 3-21-74.

Oklahoma County:

Northeast Marion discovery. An-Son Corp. 1 Choctaw, C NW NW 4-11n-1w. IPCOF 2,300 Mcf, Misener 6,219-24 ft. Comp. 3-16-74.

Texas County:

National Oil and Amarex Inc. 1 Jackson, C NE SW 6-3n-15eCM. IPF 59,109 Mcfd, COF 71,158,000 cfd. Upper Morrow 6,120-26 ft. Comp. 2-14-74. Opens North Guymon field.

TEXAS GULF COAST

Chambers County:

McMoran 1 State Tract 64, 17 miles northeast of Texas City in St. Tr. 64, Trinity Bay. IPAOF 10,300 Mcfd, Frio Oligocene 9,781-83 ft, SITP 6,220 psi, GCR 25,365:1, 45.6°. TD 11,890 ft. Elev. 20 ft KB. Comp. 5-1-74. Contractor Marine Drilling Co. New gas discovery.

SOUTH TEXAS

Pee County:

Laura Thompson South. Exxon 14 Laura T. Barrow, 11 miles east of Skidmore in Fat Downey Sur., A-20. IPAOF 10,000 Vicksburg Oligocene 5,162-73 ft. SICP 2,014 psi, GCR 119,870, 60.5°, BHSIP 2,318 psi. TD 6,050 ft. Elev. 83 ft GRD. Comp. 2-17-74. Reported May 1974. Contractor Field Drilling Co. New gas discovery.

Webb County:

Midwest Oil Corp. 1 Dan M. Sanchez, Jr., 4 miles southwest of Encinal in S&M Sur. 397, A-2076. IPAOF 190 Mcfd, dry, Escondido Cretaceous 5,983-6,013 ft, SITP 2,414 psi, BHSIP 2,798 psi. TD 8,077 ft. Elev. 540 ft GRD. Comp. 2-14-74. Reported May 1974. New gas discovery. Contractor Baggett. Shar-Alan Oil Corp. et al. 1 Gates Ranch, 50 miles north-northwest of Laredo in C. C. Ramsey 1726, A-2860, W. Brown Sur. 1726-A-2165. IPAOF 1,400 Mcfd, Olmos Cretaceous N-4 sand, 5,615-20 ft. TD 5,750 ft. Elev. 666 ft GRD. Comp. 11-23-73. Reported May 1974. New gas discovery. Contractor Dixon.

San Patricio County:

North Portland discovery. Edwin L. Cox 1 City of Portland Gas Unit "C," north side of Portland in T. T. Williamson Sur., A-248. IPAOF 24,000 Mcfd, Frio Anderson 11,190-11,220 ft. GCR 7,214:1, 57.4°, SITP 6,955 psi, BHSIP 8,970 psi. TD 11,320 ft. Elev. 34 ft GRD. Comp. 1-27-74. New gas discovery. Contractor Flournoy.

Mary Iris discovery. Goldston Oil Corp. 2 Miller, 3 miles southwest of Sinton in M. McAuley Sur., A-13. IPAOF 10,200 Mcfd, Frio 5,510-12 ft. SITP 1,515 psi, BHSIP 1,725 psi. Dry. TD 8,327 ft. Comp. 2-20-74. Elev. 55 ft GRD. New gas discovery. Contractor BDK Drilling Co.

WEST TEXAS

Crane County:

Texas Oil & Gas Corp. 1 Reed-Butler, 19 1/2 miles west and 1 1/2 miles south of Crane in Sec. 10, Blk. 4, H&TC Survey. IPCAOF 8,250 Mcfd, dry, Wichita Albany Permian 5,458-5,538 ft. TD 6,180 ft. PB 6,124 ft. Elev. 2,418 ft GRD. Comp. 4-1-74. New gas discovery. SIWHP 2,368 psi, SIBHP 2,706 psi. Contractor Rod-Ric Drilling Co.

Edwards County:

W. B. Osborn 1 Shanklin "10," 8 miles north and 7 miles west of Rocksprings in J. H. Bunton Sur. 10, A-1862. IPCAOF 1,900 Mcfd, Canyon Pennsylvanian 4,498-4,510 ft, GOR 2,123,000:1, 53.7°, SIWHP 1,181 psi, SIBHP 1,344 psi. TD 6,050 ft. PB 4,688 ft. Elev. 2,177 ft GRD. Comp. 3-21-74. Contractor Tucker.

Irion County:

Amoco Production Co. 1 Sugg, A. A. "D," 2 miles north and 2 miles west of Mertzon in Sec. 20, Blk. 1, H&TC Sur. IPF 194 b/d, 2 bw/d, 5,605-5,723 ft. TD 7,800 ft. 16/64-in. choke, 37.2°, CP 875 psi, TP 285 psi, GOR 464:1, PBTD 6,100 ft. Comp. 4-10-74. Elev. 2,327 ft GRD. New oil discovery. Contractor Tom Brown.

Kimble County:

A. N. Norwood Inc. 1 Weisenburg, 12 miles south-southwest of Junction in Sec. 49, TW&NG Sur. A-638. IPCAOF 4,000 Mcfd, Canyon 1,733-40 ft. TD 2,411 ft. Elev. 2,153 ft GRD. Comp. 4-8-74. New gas discovery.

Total wells drilled in the United States*—July 1974†

Data compiled by the American Petroleum Institute												
State-district	Total completions					Total wells all types		Total exploratory wells				
	Oil wells†	Gas wells‡	Dry holes	Total wells excluding service wells, stratigraphic, and core tests		March 1974		Oil wells†	Gas wells‡	Dry holes	Total	
				wells	Footage	Wells	Footage				Wells	Footage
Alabama	1	1	6	8	76,032	8	76,032	...	...	3	3	24,214
Alaska	12	3	2	17	126,133	17	126,133	1	2	2	5	35,919
Onshore	6	3	2	11	73,347	11	73,347	1	2	2	5	35,919
Offshore	6	...	...	6	52,786	6	52,786	...	...	...	...	...
Arkansas	8	1	15	24	98,565	24	98,565	...	...	5	5	29,219
California	116	2	19	137	327,143	141	343,886	2	...	10	12	71,405
North	...	1	11	12	72,007	12	72,007	...	...	7	7	48,158
Central Coastal	15	...	4	19	60,064	21	69,192	2	...	2	4	14,897
East Central	94	1	3	98	181,177	98	181,177	...	...	1	1	8,350
South	3	...	1	4	7,681	6	15,296	...	...	...	...	...
Offshore	4	...	...	4	6,214	4	6,214	...	...	...	...	...
Colorado	18	19	28	65	417,970	65	417,970	4	1	22	27	172,706
Florida	2	...	1	3	35,547	3	35,547	...	...	1	1	11,740
Illinois	13	1	30	44	129,356	44	129,356	2	1	13	16	46,591
Indiana	17	4	14	35	39,895	35	39,895	2	...	10	12	20,485
Kansas	63	18	95	182	525,147	186	528,059	10	3	56	69	208,930
Kentucky	14	9	30	53	90,051	55	92,590	1	4	14	19	26,868
Louisiana	71	52	124	247	1,893,142	248	1,895,403	3	7	62	72	700,502
North	33	19	55	107	443,984	108	446,245	2	...	25	27	169,791
South	27	26	40	93	1,044,916	93	1,044,916	1	7	25	33	456,077
Offshore	11	7	29	47	404,242	47	404,242	...	...	12	12	74,634
Michigan	13	5	24	42	214,762	44	222,674	6	4	19	29	146,886
Mississippi	13	1	37	51	445,162	51	445,162	1	...	29	30	278,230
Montana	3	11	35	49	125,706	49	125,706	...	5	25	30	85,829
Nebraska	7	...	24	31	154,163	31	154,163	3	...	18	21	105,748
New Mexico	24	49	28	101	555,305	103	564,235	...	5	14	19	115,928
East	18	14	24	56	385,955	58	394,885	...	5	12	17	111,967
West	6	35	4	45	169,350	45	169,350	...	...	2	2	3,961
New York	3	...	...	3	4,113	3	4,113	...	...	...	...	...
North Dakota	5	...	6	11	97,355	11	97,355	1	...	5	6	51,751
Ohio	44	60	10	114	495,299	114	495,299	2	6	2	10	41,230
Oklahoma	63	48	66	177	1,043,674	187	1,062,244	2	5	9	16	181,182
Pennsylvania	45	26	3	74	159,854	74	159,854	2	6	2	11	43,252
South Dakota	...	...	1	1	8,730	1	8,730	...	...	1	1	8,730
Tennessee	3	...	5	8	10,526	8	10,526	1	...	4	5	5,915
Texas	394	122	242	758	4,005,635	769	4,037,095	26	41	164	231	1,604,414
Dist. 1	13	3	14	30	118,415	30	118,415	...	2	11	13	59,135
Dist. 2	2	19	34	59	356,626	59	356,626	2	9	26	37	241,101
Dist. 3	44	18	40	102	665,034	104	666,003	6	13	27	46	414,234
Dist. 4	22	30	18	70	478,254	70	478,254	3	8	10	21	151,997
Dist. 5	...	1	2	3	22,817	3	22,817	...	1	2	3	22,817
Dist. 6	3	5	9	17	134,522	18	135,087	1	1	9	11	94,445
Dist. 7B	32	6	35	73	240,743	73	240,743	...	2	22	24	99,522
Dist. 7C	33	12	16	61	346,239	62	350,239	4	2	9	15	107,210
Dist. 8	114	9	14	137	709,023	139	712,016	4	...	11	15	113,827
Dist. 8A	44	...	11	55	307,610	55	328,760	3	...	8	11	80,707
Dist. 9	56	5	29	90	248,650	91	249,433	2	...	13	15	67,226
Dist. 10	27	14	7	48	267,541	48	267,541	1	3	3	7	41,032
Offshore	...	...	13	13	111,161	13	111,161	...	...	13	13	111,161
Utah	7	1	2	10	91,398	10	91,398	1	...	2	3	26,760
Virginia	...	1	...	1	5,216	1	5,216	...	...	...	...	...
West Virginia	...	24	2	26	70,593	26	70,593	...	...	...	...	...
Wyoming	43	3	35	81	554,305	82	565,454	3	1	29	33	254,627
Total—July 1974	1,008	461	884	2,353	11,801,777	2,380	11,903,253	73	91	522	686	4,299,061
Total—June 1974	1,238	586	982	2,806	12,976,388	2,933	13,258,441	81	111	540	732	4,142,122
Cum. 1974	6,750	4,082	6,303	16,676	84,983,007	17,705	86,337,356	49	653	3,651	4,753	28,448,624
Cum. 1973	5,615	3,229	5,632	14,476	72,960,446	19,031	74,393,319	34	469	3,219	3,971	...

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from June 29, 1974, through July 26, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests, and outpost (extension) tests. ||Includes one strat test and 35 service wells, 750 ft and 100,726 ft, respectively.

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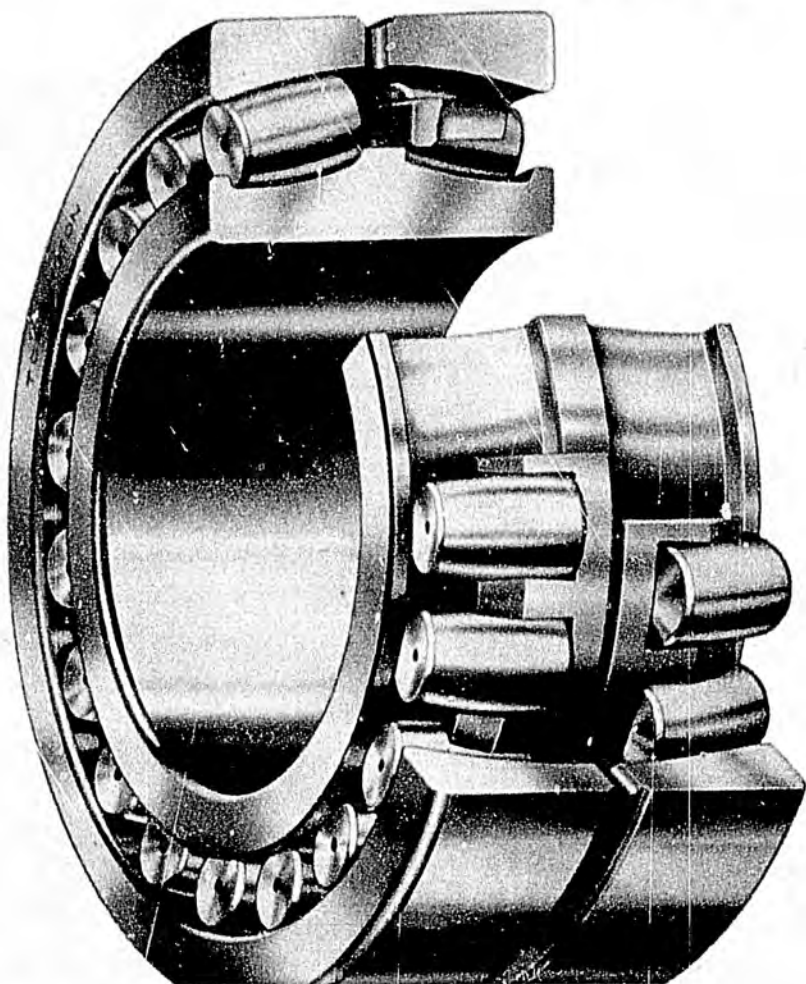


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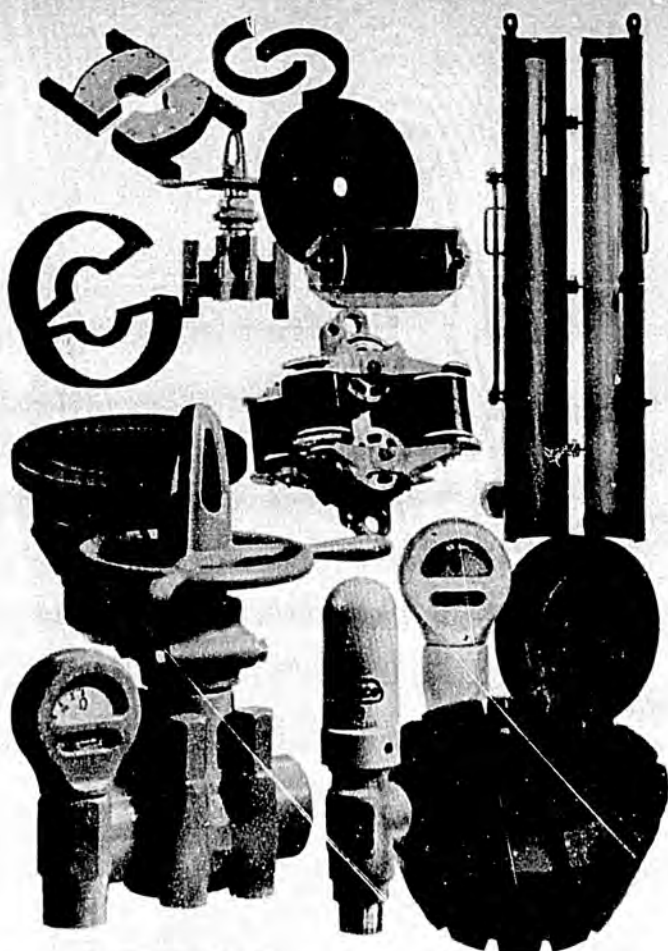


Total wells drilled in the United States*—June 1974†

Data compiled by the American Petroleum Institute.

State-district	Total wells excluding service wells, stratigraphic, and core tests					Total wells all types, June, 1974‡		Total exploratory wells*				
	Oil wells†	Gas wells§	Dry holes	Wells	Footage	Wells	Footage	Wells†	Oil wells§	Gas holes	Dry Wells	Footage
Alabama	1	....	4	5	30,522	5	30,522	....	....	3	3	26,895
Arizona	1	....	....	1	4,009	1	4,009	....	....	....	....	....
Arkansas	16	4	16	36	186,015	36	186,015	3	1	8	12	68,397
California	186	8	26	220	529,057	252	588,351	2	1	19	22	105,408
North	....	8	10	18	90,684	18	90,684	....	1	7	8	39,998
Central Coastal	24	....	9	33	126,344	33	126,344	1	....	9	10	42,059
East Central	148	....	5	153	249,394	179	284,206	1	....	1	2	9,125
South	5	....	2	7	30,473	13	54,955	....	....	2	2	14,226
Offshore	9	....	....	9	32,162	9	32,162	....	....	....	....	....
Colorado	16	12	45	73	469,201	73	469,201	3	1	30	34	205,730
Florida	3	....	4	7	91,142	7	91,142	....	....	3	3	28,419
Illinois	27	....	34	61	163,911	63	166,895	2	....	18	20	53,096
Indiana	12	2	21	35	47,237	35	47,237	1	....	17	18	22,791
Kansas	99	32	133	264	781,900	276	793,668	12	3	55	70	258,531
Kentucky	22	11	22	55	82,699	59	87,353	6	1	7	14	25,413
Louisiana	62	41	77	180	1,357,616	181	1,360,226	....	3	29	32	264,370
North	26	22	26	74	289,054	75	291,664	....	1	14	15	92,466
South	9	11	18	38	407,024	38	407,024	....	1	5	6	74,547
Offshore	27	8	33	68	661,538	68	661,538	....	1	10	11	97,357
Michigan	6	6	24	36	178,249	36	178,249	2	3	20	25	140,472
Mississippi	6	4	30	40	313,030	40	313,030	3	2	22	27	215,552
Missouri	....	....	1	1	2,375	1	2,375	....	....	1	1	2,375
Montana	3	9	27	39	102,276	39	102,276	1	2	20	23	64,834
Nebraska	1	....	16	17	89,337	17	89,337	....	....	11	11	57,290
New Mexico	52	23	37	112	619,389	118	637,226	1	5	19	25	135,169
East	45	16	28	89	516,031	95	533,868	1	4	15	20	120,740
West	7	7	9	23	103,358	23	103,358	....	1	4	5	14,429
New York	9	....	....	9	11,395	23	33,303	....	....	....	....	....
North Dakota	1	....	5	6	57,192	6	57,192	....	....	2	2	18,939
Ohio	49	83	9	141	545,947	141	545,947	1	11	1	13	61,103
Oklahoma	132	56	109	297	1,589,640	316	1,641,525	8	5	33	46	242,623
Pennsylvania	87	74	8	169	414,830	183	434,740	1	8	6	15	78,707
South Dakota	....	....	1	1	1,989	1	1,989	....	....	1	1	1,989
Tennessee	10	3	5	18	29,984	18	29,984	3	3	5	11	19,521
Texas	372	135	262	769	4,143,519	792	4,232,722	26	49	163	238	1,575,053
Dist. 1	16	8	13	37	141,850	37	141,850	....	4	7	11	59,086
Dist. 2	5	31	21	57	324,853	57	324,853	2	12	13	27	166,592
Dist. 3	20	13	20	53	378,272	53	378,272	2	8	13	23	228,154
Dist. 4	14	7	16	37	255,140	38	259,448	2	2	10	14	96,357
Dist. 5	3	2	4	9	59,196	9	59,196	....	1	4	5	50,340
Dist. 6	7	7	9	23	176,007	27	188,681	....	1	7	8	64,717
Dist. 7B	25	10	67	102	356,933	106	369,283	1	2	37	40	161,141
Dist. 7C	46	19	15	80	434,029	80	434,029	3	4	12	19	98,211
Dist. 8	95	15	20	130	932,152	130	932,152	4	8	11	23	224,995
Dist. 8A	64	6	15	85	477,291	96	529,449	1	....	11	12	81,256
Dist. 9	68	10	39	117	336,134	120	343,847	10	6	18	34	159,240
Dist. 10	9	7	7	23	141,018	23	141,018	1	1	4	6	54,320
Offshore	....	....	16	16	130,644	16	130,644	....	....	16	16	130,644
Utah	13	3	6	22	148,711	22	148,711	....	2	3	5	39,298
West Virginia	4	74	15	93	285,789	93	285,789	....	7	8	15	60,665
Wyoming	48	6	45	99	699,427	99	699,427	6	4	36	46	369,478
Total -- June, 1974	1,238	586	982	2,805	12,976,308	2,933	13,258,441	81	111	540	732	4,142,122
Total May 1974	957	520	870	2,347	16,459,595	2,425	11,665,639	58	90	495	643	3,848,877
Cum. 1974	5,742	3,621	5,419	14,323	73,181,230	15,316	74,434,103	376	562	3,129	4,067	24,149,563
Cum. 1973	4,703	2,725	4,792	12,220	61,964,507	12,679	63,193,436	291	341	2,735	3,367	....

*Does not include miscellaneous drilling not related to oil and gas exploration and production. †Covers reports of completed or abandoned wells received by the API during the period from May 25, 1974 through June 28, 1974. ‡Includes multiple completion wells which produce gas from one or more zones but oil from at least one zone. A multiple completion well is counted as one well. §Includes multiple completion wells that produce gas from all zones. A multiple completion well is counted as one well. Gas wells also include so-called condensate wells. ¶Exploratory wells include: new-field wildcats, new-pool wildcats, deeper-pool tests, shallower-pool tests, and outpost (extension) tests. ||Includes one strat test and 126 service wells, 2,026 and 280,027 ft, respectively.



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FEA reports gasoline-market breakout

REFINERS' gasoline sales to independent marketers—both branded and unbranded—decreased to 82.7% of total national gasoline sales for the first 5 months of 1974, compared with 83.4% for the first 5 months of 1972, the Federal Energy Administration reports.

FEA's definition of an independent marketer includes major-company jobbers and branded dealers as well as private-brand marketers.

Refiners' sales to their own operated retail outlets, however, increased from 7.9% of all gasoline sold in the first 5 months of 1972 to 9% during the same months of 1974.

These figures come from an FEA report on petroleum market shares, compiled by the agency itself. The study is the third in 2 months, and differs with the conclusions found in the earlier ones.

A study made by the Independent Gasoline Marketers Council showed that unbranded marketers' share of the market declined from 3.59% in February 1972 to 3.28% in 1974, a 17.1% loss.

But a study conducted by Lundberg Survey Inc. showed that this market share increased from 9.5% in February 1972 to 11.53% in February 1974, a 21% gain.

While FEA's figures may not be comparable to the previous studies, they do add more statistics to the debate over whether the independent share has declined.

FEA findings. FEA's survey of 88 refiners, accounting for 92% of U.S. refinery capacity, and 13 importers also shows that market shares of independent marketers and wholesale purchaser-resellers during 1972 amounted to 80.3 billion gal, or 83.6% of all sales. Sales to such independent marketers in 1973 were larger—84.1 billion gal. But the proportion of total sales was fractionally smaller—83.2%.

In the first 5 months of 1974, the proportion of total sales to independent marketers was smaller than in the corresponding period of either 1972 or 1973—82.7% compared with 83.4% in 1972 and 83.7% in 1973. Gallonage, however, was slightly higher in the first 5 months of 1974—32.1 billion gal compared with 31.9 billion for the same time period in 1972. But it was lower than the 34 billion gal sold dur-

Total adjusted sales: distribution and market share

Month	Total sales, Thous. gal	Share %	Market shares		
			Sales through company-operated outlets, %	Other direct sales, %	Sales to independent marketers %
Jan. 72	7,153,584	100	8.17	8.43	83.40
Feb. 72	7,078,174	100	7.81	8.65	83.55
Mar. 72	7,927,928	100	7.91	8.66	83.43
Apr. 72	7,567,110	100	8.09	8.33	83.57
May 72	8,483,729	100	7.65	9.12	83.23
Jun. 72	8,604,395	100	7.74	8.37	83.88
Jul. 72	8,421,584	100	8.22	6.62	85.16
Aug. 72	8,960,411	100	7.88	8.26	83.87
Sep. 72	8,029,019	100	7.96	8.23	83.81
Oct. 72	8,312,020	100	7.89	8.87	83.23
Nov. 72	8,031,043	100	8.02	8.41	83.58
Dec. 72	7,435,256	100	9.20	8.02	82.77
Jan. 73	7,853,849	100	8.33	8.08	83.59
Feb. 73	7,305,134	100	8.26	8.03	83.71
Mar. 73	8,405,866	100	8.12	8.02	83.86
Apr. 73	8,123,784	100	8.00	7.99	84.01
May 73	8,871,328	100	8.09	8.55	83.36
Jun. 73	8,662,211	100	8.75	7.93	83.32
Jul. 73	9,017,404	100	8.96	7.29	83.74
Aug. 73	9,398,401	100	8.80	7.69	83.52
Sep. 73	8,262,041	100	9.37	7.65	82.98
Oct. 73	8,809,817	100	9.40	8.28	82.32
Nov. 73	8,403,644	100	9.69	8.32	81.98
Dec. 73	7,907,231	100	9.81	7.73	82.46
Jan. 74	7,397,829	100	10.06	8.37	81.57
Feb. 74	6,857,549	100	9.16	8.40	82.45
Mar. 74	7,699,049	100	8.83	8.51	82.66
Apr. 74	8,052,991	100	8.54	8.24	83.22
May 74	8,797,424	100	8.32	8.38	83.30

Source: Federal Energy Administration (FEA's system of classification groups major-company jobbers and branded dealers with private-brand marketers as independent marketers).

ing the first 5 months of 1973.

The market share of total direct sales rose slightly from 1972 to 1973—16.4% to 16.8%. For the first 5 months of 1974, the share was 17.2% of all sales, compared with 16.3% for the same time period in 1973 and 16.5% for the first 5 months in 1972.

The large integrated refiners sold 71.1 billion gal of the total 96 billion in 1972, or 74.1% of the total. In 1973 the volume increased to 75.3 billion gal, and so did the proportion to 74.5%.

In the first 5 months of 1973 the volume sold by integrated refiners was 30.1 billion gal, compared with 28.6 billion in the similar period in 1972. The proportion, however, declined slightly from 74.8% to 74.1%. For the first 5 months of 1974, 28.6 billion gal were sold, accounting for 73.7% of the total.

Gasoline sales of large independent refiners, defined by FEA as controlling less than 30% of the domestic crude they refine, was 72.76% at the

end of the first 5 months of 1974, compared with 73.96% for the same time period in 1972 and 69.56% in 1973.

Sales of small refiners, defined as having less than 175,000-b/d refining capacity, also decreased from 82.4% at the end of the first 5 months in 1972 to 82% for the same period in 1974.

Sales of importers changed little in either gallonage or percentage market shares.

FEA considers these figures of great significance in the battle over whether the allocation program should be continued. The program was adopted to ensure, in part, that the independent sector of the oil industry was protected and that it retained its market share.

API survey. Meantime, the American Petroleum Institute has released a report showing that only 3.5% of U.S. service stations are directly operated by 22 of the country's largest oil companies.

The companies surveyed reported

Transworld field in U.K. North Sea called commercial

TEST results released by the Transworld exploration group indicate its wildcat has tapped a commercial oil field in Block 21/1-1 of the British North Sea.

Tests were of three Jurassic sand intervals between 9,498 ft and 9,950 ft. One, on a 24/64-in. choke, flowed 1,345 b/d. Another, on a 24/64-in. choke, flowed 890 b/d and a third, on 40/64-in. choke, made 2,177 b/d, for an aggregate of 4,412 b/d.

The unnamed discovery is the closest to shore yet in British waters, lying only about 90 miles off Peterhead, Scotland.

The group will drill its first appraisal well in first-quarter 1975.

Transworld group includes: Apexco Inc. 14%, Candel Oil Ltd. 14%, St. Joe Minerals Corp. 14%, City Investing Service 28%, C.C.P. North Sea Associates 21-1/6%, GOAL (Oil and Gas Acreage) 7 1/2%, and Petromin 1 1/3%.

Sunoco to drill deep tests in Arctic waters

SUNOCO E&P Ltd. has received drilling permits for a pair of previously announced 15,000-ft wildcats in northern Canada's Mackenzie Bay.

Contract has been let to Adeco Drilling & Engineering Co. Ltd. for both of the tests in shallow waters off the Mackenzie Delta, where the exploration pace is picking up speed (OGJ, July 22, p. 24). Both tests are to start late this month under a farm-out agreement with Bow Valley Industries Ltd., Arctic Coast Petroleums Ltd., and Numac Oil & Gas Ltd.

Sunoco's F-34 Unark is at 69° 33' 24" N. Lat., 134° 38' 48" W. Long., 8 miles west-southwest of Imperial Oil Ltd.'s J-26 Ivik oil discovery and 16 miles north-northeast of Taglu gas field, both onshore. Proposed drill site is on exploration Permit W-947.

The company's C-35 Pelly is at 69° 34' 14" N. Lat., 135° 23' 45" W. Long., 16 miles north-northwest of Taglu gas field and 14 miles east-northeast of

Imperial F-28 Adgo, drilled last March as the first offshore oil and gas discovery in the North American Arctic. Proposed site is on Permit W-948.

Both Sunoco tests are on man-made islands.

Grand Banks wildcat. Elsewhere in Canadian waters, the Amoco Canada Petroleum Co. Ltd. group scheduled a new test on the Grand Banks off the east coast. It is E-41 Skua at 45° 20'

27" N. Lat., 48° 52' 22" W. Long., 176 miles southeast of St. John's, Newf., and 75 miles south of the group's 0-46 Egret, recently abandoned at 9,000 ft.

The Skua, apparently the next to last test to be drilled in the group's Grand Banks drilling program, will be drilled by the Sedco I semisubmersible. The group plans to halt its Grand Banks campaign at year-end.

Bad petrochemical scarcity seen to worsen, Senate says

A SERIOUS shortage of petrochemicals, now being experienced by nearly 200 major corporations, is expected to get much worse, according to a study done by the Senate subcommittee on investigations.

There is "little chance of a reversal" of the shortage during the next 5 years, the report says, predicting a shortfall of 10-15% by the end of this year, a 17% shortage in 1975 and 18% in 1976.

The subcommittee sent out questionnaires to 500 major corporations, and received 258 replies. Of those, 181 companies cited a serious short supply of petrochemicals, due to the limited availability of petroleum feedstocks.

Other products listed in short supply

include steel and steel products, paper and plastics. The subcommittee will study these material shortages in hearings to be held later this month.

"Part of the shortage of some resins is due to the shift by producers of feedstocks to the most profitable products, leaving the others in very short supply," the study says.

Another reason is environmental regulations, which has created many uncertainties. The rules might change, or new ones could be imposed, after new plants are completed.

"The closing of older, marginal plants because of the expense of complying with environmental laws has reduced the capacity of the industry and intensified the petrochemical shortage," the study says.

U.S. seismic activity dips

THE COUNT of seismic crews working U.S. areas dropped slightly last month, the Society of Exploration Geophysicists reports.

Active crews numbered 321, off 13 from July.

The decrease of 12 land crews is due to three crews reported on standby in Alaska, three idle because of lack of personnel in the Lower 48, three analog crews shut down after short-term reactivation in the summer, and three included by error in previous counts. Although several marine vessels reportedly left the U.S. for foreign assignments, reactivation of vessels idle in July resulted in a net loss of only one vessel in August.

The August count of active crews is made up of 247 land crews and 27

marine vessels operated by 41 contractors and 40 land crews and 7 marine vessels operated by 12 oil companies.

Respondents to the monthly survey told SEG that the exodus of Canadian equipment and personnel to the U.S. is being followed by Canadian oil operators, who are buying seismic and velocity data in preparation for entry into U.S. exploration. Fifty-one Canadian seismic crews have halted operations since last March, leaving only 18 conventional crews at work.

Personnel and equipment shortages continue in the U.S., with drillers and shot-hole rigs heading the list. Some truck deliveries scheduled in 6-8 months are being delayed for 10 months to 1 year.

that as of June 30 they directly operated 7,375 of the country's estimated 212,000 service stations. The survey covered all stations — branded, unbranded, and secondary branded—operated by the reporting companies.

The study also shows that during the past 3 years the ratio of directly operated stations to the total of all service station has stayed essentially constant. The number of directly operated stations totaled 7,239 as of Dec. 31, 1973, and 7,641 as of Dec. 31, 1972.

Additionally, there were more conversions of company-operated station to lessee dealer operations than there were conversions from dealer operations to company stations, the survey shows.

TransCanada gets NEB approval for expansion project

CANADA'S National Energy Board has approved a \$16-million pipeline-expansion project to boost gas deliveries to eastern Canada.

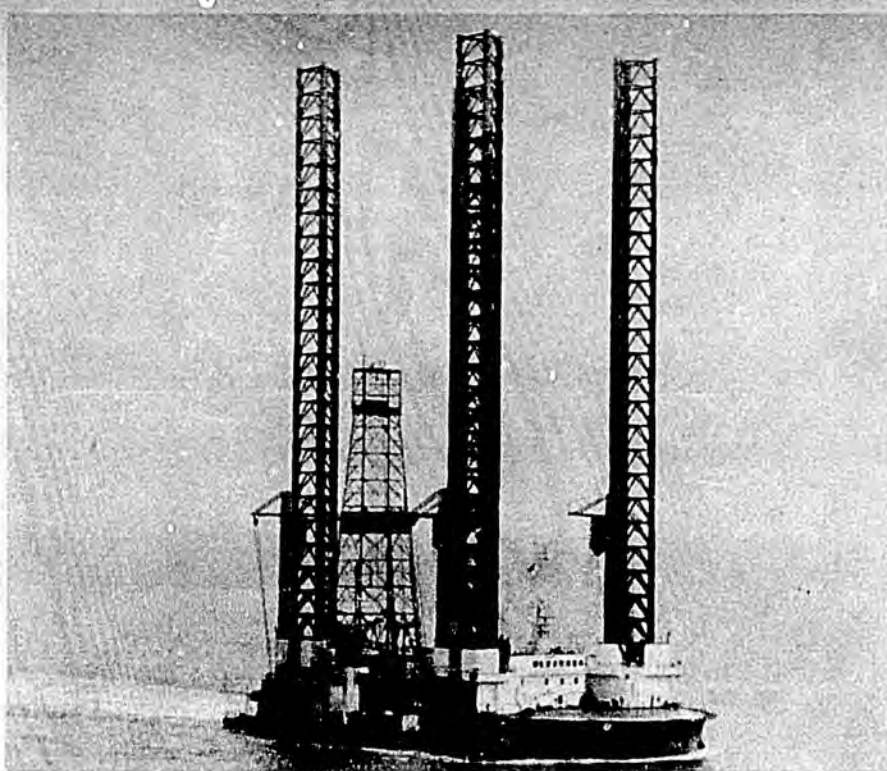
The NEB action allows TransCanada PipeLines Ltd. to lay 58½ miles of loop on its existing system in three provinces—15½ miles of 42-in. line at three locations in Saskatchewan and Manitoba and 43 miles of 24-in. line at four locations in Ontario. The project, scheduled for completion by Nov. 1, will add 45.5 MMcf/d to system capacity.

Delivery of 35.5 MMcf/d is scheduled to Gaz Metropolitan Inc., Montreal, under its first direct purchase from Pan-Alberta Gas Ltd. Greater Winnipeg Gas Co. will receive 10 MMcf/d via direct purchase from Provident Resources Ltd.

Westcoast link. Meantime, Pan-Alberta has agreed to supply up to 58 MMcf/d of gas to Westcoast Transmission Co. Ltd., Vancouver. Deliveries are to begin early in 1975, subject to regulatory approval.

The contract calls for the first direct link between the systems of Westcoast and Alberta Gas Trunk Line Co. Ltd. AGTL plans about 40 miles of line to join the two systems.

Price and terms of the agreement between Pan-Alberta and Westcoast are not disclosed, but the contract covers a period of less than 3 years.



DRILLSHIP Offshore Mercury moves through the English Channel en route to the Irish Sea.

Self-propelled jack-up rig to drill Irish Sea wells

OFFSHORE MERCURY, one of only three self-propelled jack-up drillships operating worldwide, is now on location in the Irish Sea working for Hydrocarbons Great Britain Ltd., a wholly owned subsidiary of British Gas.

The firm plans to drill two wells, the first in the northern part of its Block 110/2, 26 miles off Blackpool.

The drillship maneuvered under its own power through the English Channel from the North Sea. It was guided into position by a survey ship,

the Decca Recorder. The Decca Recorder had previously scanned the seabed to map an area where the rig could be jacked up and the legs lowered without meeting any obstruction.

Offshore Mercury, designed and owned by Offshore Co., was the first self-propelled jack up built. It worked in Argentine and Mozambique waters prior to the North Sea.

The vessel is 276 ft long and 130 ft wide. It is capable of working in waters up to 250 ft deep and can drill to 20,000 ft.

CRA to buy Cayman assets in Colombia

CRA INC. has agreed to buy Cayman Corp.'s holdings in Colombia for \$4.5 million.

CRA, in an agreement subject to approval by Cayman shareholders and the Colombian Government, would acquire about 8,000 b/d of oil production and an interest in the trans-Andean pipeline from Cayman International Exploration Co. The latter holds a 20% interest in the pipeline and in a 615,000-acre concession in the Putumayo basin.

In addition, Cayman International owns a 25% interest in two contracts of association covering a total of 440,000 acres and a seismic option on another 2.5 million acres, both in the Putumayo region of Colombia.

Cayman's operations in Ecuador wouldn't be affected by the transaction.

CRA is a subsidiary of Farmland Industries Inc., Kansas City, and Cayman International is 90% owned by Cayman Corp.

INTERNATIONAL BRIEFS

DRILLING

JAPAN Petroleum Co. (Nigeria) Ltd., says it plans to begin a 12-well drilling program next year in its six Off-shore Nigerian blocks and aims for initial production by 1976.

The company, which has found oil in four of eight wells drilled, is drilling its ninth well now and may drill another before the end of the year.

► **The Woodside Burmah group's** 1 Troubadour wildcat in permit NT-P 12 in the Bonaparte Gulf basin 275 miles northwest of Darwin, Australia, tested a combined rate of 9.84 MMcf/d of gas and 233 b/d of condensate through a 3/4-in. choke. The test intervals were between 7,307-24 ft and 7,341-60 ft. The well is in 289 ft of water and is projected to a total depth of 11,152 ft.

► **Venezuela's state-owned CVP** has launched a program to drill 32 stratigraphic holes in the 375-mile-long Orinoco heavy oil belt in Venezuela. The Mines and Hydrocarbons Ministry has budgeted \$13.2 million for the program, which is aimed at verifying the different qualities of crude in the belt. The belt has been estimated to have over 700 billion bbl of heavy oil reserves.

► **After 14 years,** drilling has been resumed in the rugged Mand Mountains of southern Iran, near the Persian Gulf shore. The Iranian consortium drilled the 1 Mand in 1960 and abandoned it at 13,541 ft. Now Oil Service Co. of Iran has drilled to about 12,500 ft in the 2 Mand and will carry the hole to about 15,000 ft in search of oil or gas in the Permian Khuff formation. Santa Fe's rig 98 is drilling the well.

TRANSPORTATION

WORK on the Moomba-Sydney gas pipeline in Australia has been held up since July by a strike of construction employees, who last week were to meet to discuss terms of a settlement with the contractors and the National Pipeline Authority.

It is estimated now that the pipeline will cost more than \$362 million, compared with an estimate of \$232 million made 2 years ago.

► **The Indian Oil Corp.** has an-

nounced plans to build an offshore crude-oil terminal in the Gulf of Kutch, northwestern India. The terminal would accommodate very large crude carriers that would off-load at sea via submarine pipelines to onshore storage tanks.

AGREEMENTS

TEXAS Gulf has signed an exploration agreement with the government of Pakistan covering 11,000 sq miles in the provinces of Sind, Baluchistan, and Punjab.

The company is to put up all the risk capital for exploration.

The government has an option to acquire up to a 40% working interest in event of commercial oil or gas production.

► **The Norwegian company of A/S Fred Olsen,** a shipowning concern, is reported by the Norwegian Information Service to have applied for an exploration license from the Government of Guatemala. Location and other details of the application were not disclosed.

EXPLORATION

AMOCO Thailand Petroleum Co., subsidiary of Standard Oil Co. of Indiana and operator for itself and partner, says it tested "a few hundred b/d of crude oil" from its first wildcat drilled in the Gulf of Thailand.

The hole, spudded last July 10 some 280 miles south of Bangkok in Block 6, had a planned depth of 10,000 ft. Actual completed depth of the well and other details of the well weren't disclosed. The company, which described the test as "encouraging," has plugged and abandoned the well and moved the drillship Investigator to another site on the block to spud a second well.

Amoco is in equal partnership with Idemitsu Exploration Co. (Thailand) Ltd. in exploration rights to Blocks 5 and 6, covering about 9,400 sq miles off the east coast of Thailand.

GOVERNMENT

JAPAN Petroleum Development Corp. and Peru's state-owned Petroperu

have signed a formal agreement under which the Japanese company will lend Peru \$330 million for oil and gas exploration and development and construction of a trans-Andean crude-oil pipeline (OGJ, June 10, p. 31).

The newly created Japan Peru Oil will be permitted to buy crude and petroleum product supplies from Petroperu as part repayment for the loan.

The 511-mile, 250,000-b/d crude pipeline itself is expected to cost \$500 million.

PROCESSING

PHILLIPS Puerto Rico Core Inc. will have Procon Inc. build its 470-million-lb/year paraxylene expansion at Guayama, Puerto Rico. Completion of the project is expected in early 1977.

The plant will be built adjacent to an existing facility. Total cost is expected to exceed \$34 million.

► **Mobil Technical Services Co.** has let a contract to Kellogg International Corp. to design its 2,740 b/d grass-roots lube-oil plant at Jeddah, Saudi Arabia. The project is a joint venture of Mobil and Petromin. Plant will consist of a vacuum unit, propane deasphalting, furfural unit, and MEK dewaxing.

► **East African Oil Refineries** has put its Mombasa, Kenya, refinery expansion on stream raising capacity to 80,000 b/d from 55,000 b/d. The Mombasa refinery is owned 50% by the government and 50% by BP, Caltex, Esso, and Shell.

► **South African Coal, Oil & Gas Corp.** is expanding capacity an undisclosed amount at its oil-from-coal plant at Sasolburg, South Africa, by the addition of two steam-generating units.

► **Petroleos del Norte** plans a 450,000-ton/year ethylene plant and refinery expansion to 240,000 b/d from 120,000 b/d at Somorostro near Bilbao, Spain. Government approval has been requested. Completion is planned for 1980.

► **Petroquimica-Dow S.A.** will double the capacity of its low-density polyethylene plant at Concepcion, Chile, to 40,000 metric tons/year from 20,000 tons/year by late 1975.

The top 10 U.S. oil companies: Their record on profits and rate of return

	Sales (billions of dollars)	Net income (millions of dollars)	Capital expenditures (millions of dollars)	Invested capital (millions of dollars)	Return on invested capital (percent)
1. EXXON					
1964	\$10.8	\$1,050.6	\$1,046.5	\$9,630	12.2%
1965	11.5	1,035.7	971.3	10,054	11.5
1966	12.2	1,090.9	1,204.8	10,482	11.6
1967	13.3	1,192.3	1,618.6	11,361	11.9
1968	14.1	1,276.7	1,944.1	12,803	11.8
1969	14.9	1,242.6	1,690.7	13,207	10.9
1970	16.6	1,309.5	1,793.6	14,418	10.8
1971	18.7	1,516.6	1,810.8	15,360	11.5
1972	20.3	1,531.8	1,984.0	16,173	10.9
1973 est.	28.5*	2,440.0	2,252.0	17,706**	14.0**

2. MOBIL					
1964	\$ 4.5	\$ 294.2	\$ 460.2	\$3,812	8.3%
1965	4.9	320.1	557.3	3,999	8.7
1966	5.3	356.1	682.2	4,147	9.3
1967	5.8	385.4	678.5	4,568	9.4
1968	6.2	430.7	713.2	5,027	9.8
1969	6.6	456.5	800.0	5,274	9.6
1970	7.3	482.7	879.5	5,729	9.5
1971	8.2	540.8	1,037.6	6,183	9.7
1972	9.2	574.2	1,180.0	6,482	9.6
1973 est.	12.7*	842.8	1,340.0	6,958**	11.7**

3. TEXACO					
1964	\$ 3.6	\$ 577.4	604.8	\$4,300	14.4%
1965	3.8	636.7	718.9	4,591	14.8
1966	4.4	709.9	737.4	5,265	14.9
1967	5.1	754.4	893.7	5,945	14.2
1968	5.5	835.5	1,065.3	7,358	13.4
1969	5.9	769.8	791.9	7,928	10.9
1970	6.3	822.0	906.1	8,363	10.9
1971	7.5	903.9	1,162.2	9,219	11.0
1972	8.7	889.0	1,192.9	9,798	10.2
1973 est.	11.8	1,292.4	1,600.0	10,734**	12.1**

4. GULF					
1964	\$ 3.2	\$ 395.1	781.8	\$4,038	10.5%
1965	3.4	427.2	783.5	4,408	10.7
1966	3.8	504.8	1,035.2	4,923	11.5
1967	4.2	568.3	873.0	5,349	11.7
1968	4.6	626.3	1,182.9	6,305	11.3
1969	5.0	610.6	1,551.7	6,786	10.4
1970	5.4	550.0	989.8	7,325	8.9
1971	5.9	561.4	891.0	8,016	8.3
1972	6.2	447.0	959.9	7,738	6.6
1973 est.	NA	775.0	1,632.0	NA	NA

5. STANDARD OIL OF CALIFORNIA					
1964	\$ 2.3	\$ 345.3	570.0	\$3,299	11.1%
1965	2.4	391.2	654.0	3,513	11.8
1966	2.7	401.2	557.0	4,029	11.0
1967	3.3	421.7	643.0	4,477	10.4
1968	3.6	451.8	651.0	4,830	10.3
1969	3.8	453.8	775.0	5,143	9.7
1970	4.2	454.8	788.0	5,391	9.2
1971	5.1	511.1	857.0	5,974	9.7
1972	5.8	547.1	789.0	6,253	9.6
1973 est.	8.9*	843.8	1,200.0	6,986**	11.4**

NA, not available. NM, not meaningful.

*Includes excise taxes and other income.

**First nine months of 1973.

Data: Investors Management Sciences, BW est.

	Sales (billions of dollars)	Net income (millions of dollars)	Capital expenditures (millions of dollars)	Invested capital (millions of dollars)	Return on invested capital (percent)
6. STANDARD OIL (INDIANA)					
1964	\$ 2.3	\$ 194.8	487.8	\$2,978	7.3%
1965	2.5	219.3	475.5	3,087	7.9
1966	2.7	255.9	569.5	3,364	8.6
1967	2.9	282.3	638.7	3,513	9.0
1968	3.2	309.5	796.9	4,102	9.1
1969	3.5	321.0	857.2	4,334	9.0
1970	3.7	314.0	713.3	4,478	8.5
1971	4.1	341.7	720.4	4,838	8.6
1972	4.5	374.7	940.6	5,138	8.6
1973 est.	6.5*	511.2	1,000.0	5,826**	9.5**

7. SHELL					
1964	\$ 2.3	\$ 198.2	\$432.0	\$1,880	11.4%
1965	2.6	234.0	530.7	2,166	12.2
1966	2.8	255.2	564.0	2,451	11.9
1967	3.1	284.8	618.4	2,786	11.9
1968	3.3	312.1	554.1	3,473	10.9
1969	3.5	291.1	628.8	3,632	9.0
1970	3.6	237.2	634.8	3,854	7.2
1971	3.9	244.5	450.5	3,944	7.3
1972	4.1	260.5	590.9	4,243	7.5
1973 est.	5.8*	332.7	NA	4,342**	8.8**

8. CONTINENTAL					
1964	\$ 1.3	\$ 100.1	\$225.0	\$1,278	9.7%
1965	1.4	96.1	199.8	1,356	8.7
1966	1.7	115.6	282.4	1,561	9.2
1967	2.1	136.1	383.5	1,904	9.2
1968	2.3	150.0	389.0	2,025	9.2
1969	2.4	146.4	337.3	2,327	8.4
1970	2.7	160.5	366.2	2,377	8.4
1971	3.1	140.1	387.5	2,425	7.4
1972	3.4	170.2	458.1	2,534	8.4
1973 est.	NA	225.0	375.0	NA	NA

9. ATLANTIC RICHFIELD					
1964	\$ 0.6	\$ 47.1	NM	\$ 825	6.5%
1965	0.7	66.2	NM	866	8.4
1966	1.1	113.5	NM	1,370	10.8
1967	1.3	130.0	NM	1,541	10.0
1968	1.4	148.9	NM	1,999	9.6
1969	2.7	230.1	\$418.4	3,324	10.5
1970	2.7	205.6	466.6	3,699	7.0
1971	3.1	210.5	543.9	3,800	6.7
1972	3.3	192.5	363.5	3,777	6.1
1973 est.	4.5*	270.2	NA	NA	NA

10. PHILLIPS					
1964	\$ 1.3	\$ 115.0	\$195.0	\$1,607	7.9%
1965	1.5	127.7	232.4	1,740	8.3
1966	1.8	138.4	271.1	2,083	8.4
1967	2.0	164.0	279.8	2,269	9.0
1968	2.1	129.9	289.2	2,351	6.9
1969	2.2	127.8	316.6	2,526	6.8
1970	2.3	117.1	239.4	2,433	6.3
1971	2.4	132.3	225.0	2,610	7.0
1972	2.5	148.4	264.7	2,678	7.2
1973 est.	3.1	230.4	NA	NA	NA

Sales: Revenues minus other income and consumer excise taxes.

Net income: Income after taxes and before extraordinary items.

Invested capital: Sum of long-term debt, minority interest, preferred stock, deferred taxes and investment tax credit, and common equity.

Return on invested capital: Sum of net income, income of minority interest, and fixed charges (minus tax on fixed charges) divided by average invested capital.

Now the investment balance has shifted in favor of developing domestic oil

duction now free from controls, the average price of domestic oil has reached \$7, twice the average of a year ago. As a result, oilmen say, profits on domestic oil operations could rise by at least one-third. Declares James P. Murphy, president of Houston's Inexco Oil Co.: "The romance of finding great riches has returned to oil."

That is not exactly the way executives of the oil giants view it. They concede that U.S. profits could be up sharply this year. But they see many uncertainties abroad. They say foreign earnings could drop partly because of the strengthening of the dollar. Their margins in Europe may also fall, they say, as governments use price controls to ease the blow of high-priced Middle East crude. "The industry might be doing very well this year to equal its performance of last year," says Harold H. Hammer, senior vice-president of Gulf Oil Corp.

Plenty of money to spend

The oilmen staunchly insist on their need for higher profits. The far higher profits that the industry earned last year provided a higher rate of return for most companies than any year since 1968. As a result, the industry's biggest problem of a year ago—raising enough capital to find new supplies of oil and gas—may well have been solved. Oil executives say that until last year the industry's poor performance was leading it into a period of no growth. From 1968 through 1972, its return on investment dropped steadily from 12.4% to 8.7%, putting it 2.4 percentage points below other manufacturing.

Meanwhile, capital requirements of the business were growing rapidly as oilmen sought to replace dwindling reserves with vastly more expensive oil from the North Sea, the Gulf of Mexico, and Alaska. As a result, the industry's ratio of debt to capital climbed in the last decade from 16% to 24%—close to what many believe is the practical limit for a high-risk industry.

Now that picture has changed, too. Oil returns last year equaled those of other industries. "A year ago we were cutting each other's throats in price wars while crude prices were being held down by cheap foreign oil," says Harry Bridges, president of Shell Oil Co. "It's incredible that in one year those pressures are turned all the way around. Our financial concerns have evaporated."

Capital problems also may be eased because less capital may be needed. Says oil consultant Richard J. Gonzalez: "All the forecasts about the huge capital needs of the oil industry are

worthless now because, at these high prices, we are going to consume a lot less energy, so the financial requirements will not be nearly as great." Gonzalez believes that the growth rate in energy consumption may be cut in half, to 3% a year.

Still, not all oilmen agree that their financial troubles are over. They insist that in the years ahead oil will require much more capital than other industries, so its return must also be better than average—perhaps around 16% instead of 12%. Mobil's Warner argues: "If we're going to do the job, even these [1973's] prices and profits fall short." This kind of talk infuriates the industry's many critics. "Those guys are like horses that don't know how to stop when the race is over," declares Lee C. White, former chairman of the Federal Power Commission.

While oil executives may disagree on the adequacy of returns, they are not hesitating to apply their higher profits to huge increases in their capital budgets. Capital spending by the nation's oil companies is likely to jump 20% this year, and many companies' capital budgets, which include projects that extend over more than one year, are up an estimated 50% from a year ago.

Even more important is the direction that the spending is taking. For years, investment in foreign operations boomed while that in domestic operations stagnated. In the last 10 years, corporate investment in oil abroad rose from \$6-billion to \$16-billion while oil investment in the U.S. edged up only from \$6-billion to \$10-billion. Now the balance has shifted in favor of U.S. projects. "There now is improved financial attraction for us in this country and greater risk outside," says Mobil's Warner. "So the money will begin to flow back here." That is precisely where the Nixon Administration wants it to flow, as a step toward energy self-sufficiency. "The tilt has definitely come back to this side of the Atlantic," says federal energy chief William E. Simon.

Richer prospects at home

The shift in spending is encouraged, too, by the domestic oil prospects that higher prices have opened up. There were poor oil prospects at \$3.50 a bbl., but there should be hordes of them at \$10. Says Edward B. Walker, executive vice-president of Gulf: "This could be the biggest boom in oil exploration that this country has seen."

Drilling has already been stepped up. Late last year, the number of rigs in operation in the U.S. rose to more than 1,400—the highest since the mid-1960s.

There could be another 25% increase in domestic drilling this year, reversing a 15-year decline that cut by half the number of wells drilled each year. "With these prices," says Shell's Bridges, "everyone is taking risks that three years ago they never would have



'We are embarking on the oil industry's version of Project Candor'

—J. Kenneth Jamieson, chairman, Exxon.

taken." The revival of drilling also gives new life to domestic independent oil producers, whose numbers have dropped in 20 years from 20,000 to fewer than 8,000. "The Arabs gave us an oil price that our own Congress would never have given, and we're no longer dying on the vine," beams Joseph C. Walter, Jr., president of Houston Oil & Minerals Corp.

Oilmen are also trying to revitalize old wells because increased production from them can be sold at the \$10 price. By water flooding as a secondary recovery technique, oilmen ordinarily can recover about 34% of the oil in the ground. With chemical treatment, they can boost recovery to 40%, but this expensive tertiary production technique is not economical for \$3.50 oil. With \$10 oil, it is. Shell, Gulf, and many others are rapidly stepping up tertiary recovery. The potential gain is enormous because an increase of six percentage points in oil recovery would produce an additional 25-billion bbl., roughly 70% of the nation's current reserves.

Still, most oilmen insist that President Nixon's 1980 target for U. S. self-sufficiency in fuel is completely unrealistic. They say 1985 is more likely, and some question even that. "I don't think we'll ever be independent in oil supplies," says Exxon's Jamieson. "And the time lag in shifting to new oil sources, such as shale, is inherently there. Even at these prices there isn't much you can do to speed it up." Jamieson says that the first oil from shale plants will not flow until around 1980 and that to rely on them for a significant part of the nation's energy needs would require massive investments in time and money. Just to make up 10% of the nation's oil production by utiliz-

ing shale, he says, would require setting up a mining operation as large as that of the present U. S. coal industry.

Even more uncertain is how Europe and Japan are going to pay for their oil. Total payments to OPEC countries for oil could hit \$90-billion a year, compared with the \$25-billion projected before the two latest price increases.

This quick turn of events puts the majors' foreign earnings in serious jeopardy. Last year, the companies' profits on Eastern Hemisphere operations were roughly double the depressed 27¢ per bbl. they got in 1972. But these profits could drop this year. The majors will not find it easy to pass along the \$3.95 cost increase when they sell the refined products from Middle East crude to European countries, many of which have price controls. "There's a serious question whether we'll be able to maintain our margins on that oil and also whether Europe will continue to buy as much," says Bob R. Dorsey, Gulf's chairman. "These prices could put Japan and Europe into a tailspin, so how can we say we're go-

will levy high taxes on the oil; just as the Arabs do. Dorsey expects that oil from the North Sea and other non-OPEC areas soon will be hit by such high local taxes that profits will be cut to the same low levels as those on Middle East crude. "That's why the only safe and profitable place to invest in oil is in the U. S.," he says.

An even greater threat to the U. S. international oil giants is the possible loss of their dominant role as suppliers of oil to Europe and Japan. To begin with, they face the prospect that OPEC will claim a bigger share of the oil production for itself. More than a year ago, some OPEC countries negotiated a minimum of 25% participation with the oil companies, to rise to 51% by 1982. But already a few have nationalized a bigger portion; the largest oil producer, Saudi Arabia, is demanding equity control of more than 50%.

While the oil companies have arrangements to buy back the equity oil from the Arabs, OPEC increasingly is selling directly to the consuming nations, cutting the majors out of the deal. By selling directly, the Arabs can claim the oil companies' brokerage profits. And the consuming countries can buy oil in exchange for goods and



Richard A. Walters

'There is more financial attraction in this country and greater risk outside'

—Rawleigh Warner, Jr., chairman, Mobil.

ing shale, he says, would require setting up a mining operation as large as that of the present U. S. coal industry.

Troubles multiply abroad

While the prospects for domestic oil brighten, it is hard to imagine how the outlook for the majors' foreign operations could be more threatening. Last month, the Organization of Petroleum Exporting Countries raised the f.o.b. cost of oil to \$7 a bbl. That is more than twice the \$3.05 price in October, and more than four times the price of a year ago. Moreover, OPEC is giving clear signs that it will not increase oil shipments as fast as the concession-holders would like. The majors had



Clyde Hare

'The only safe and profitable place to invest in oil is the U. S.'

—Bob R. Dorsey, chairman, Gulf.

ing to invest more money over there under these conditions?"

Dorsey believes that the new Arab prices also threaten the profits that the majors had expected to get from foreign oil production outside the OPEC countries. Oil-importing nations are making such big payments for Arab oil that they are not likely to permit companies to make big profits on oil discovered in areas that they control. They



Lee Baker Johnson-BW

'It's incredible that in one year, the pressures turned all the way around'

—Harry Bridges, president, Shell.

services to the Arabs, reducing the drain on their treasuries.

The deals already made are only the beginning. Britain, for example, hopes to obtain 1-million bbl. of oil a day, half

The Arab countries are selling directly to consuming countries, cutting out the majors

its consumption, through deals with Iran, Saudi Arabia, Kuwait, and others. Last week it signed the first of these deals, a \$242-million barter with Iran under which it will get 100,000 bbl. of oil a day in exchange for British products.

This pattern, Jamieson warns, "could create chaos because the Arabs can play one country against another and drive the price up even more." But despite such warnings and despite a meeting of oil-consuming nations planned in Washington next week, most European oil experts expect the deals to continue. In fact, they say that the consuming countries will ultimately take over from the oil companies as the direct contact with OPEC,

other 80% into their own refineries abroad. "Wholesaling of Middle East oil is a role we'll no longer play," Mobil's Warner admits. "The producing countries will move into that market."

Still, the majors control about half the refineries in Europe, and they hope to use this trump card to retain their strong marketing position there even if direct deals between governments grow. "The majors still have big transportation and refining systems in Europe," says Jamieson. "For the consuming countries to shut them down and replace them with higher-cost facilities wouldn't make economic sense." Now that the Arabs are grabbing more of the oil companies' profits on crude, the companies will be looking to those big refineries for more of their foreign profits.

"For a long time," says Warner, "our foreign profits were on crude oil because our taxes in the Middle East were so low. Now those profits are going to have to shift downstream for the simple reason that the Middle East governments now control prices and our profits on crude."

An excess profits tax?

Just as foreign governments may put a rein on U.S. oil companies' profits abroad, so may Congress stand in the way of the majors' attempts to capitalize on their new domestic opportunities. Congress has become a hotbed of oil critics, each of them with a proposal to curb the power and profits of the oil companies.

The mood plainly frightens oil executives. "No other industry has served this country better," argues C. Howard Hardesty, Jr., executive vice-president of Continental Oil Co., "but in the space of three months everyone has forgotten our record, and people are trying to discard the very foundation of the industry." John Winger, head of Chase Manhattan's energy economics division, says flatly: "There just has never been a greater chance than now of the oil industry in this country being nationalized."

The initial threat from Congress is an added tax on oil company profits. "I'm for reasonable increases in profits for the

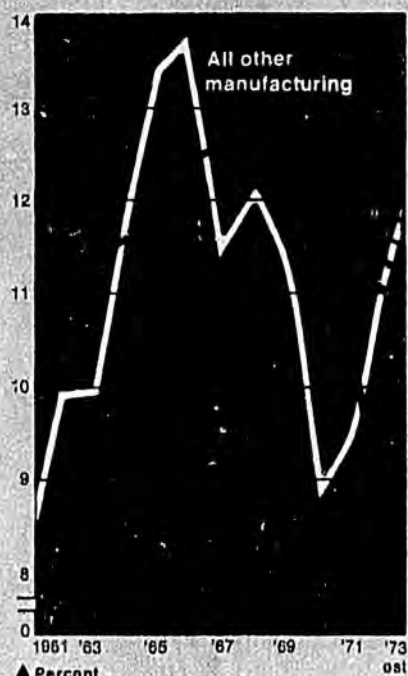
oil companies," says Senator Walter F. Mondale (D-Minn.), "but they are taking advantage of this shortage, and their profits have gone beyond reasonable incentive." There is now little doubt that an excess profits tax will be passed; the only question is what form it will take.

Oil executives fear most the windfall profits provision included in the Energy Emergency bill that was re-committed to a conference committee by the Senate this week. That provision would hold oil company profits to the average level from 1967 through 1971. Oilmen insist that such a base period is unfair because it includes years in which the industry had some of the lowest returns in its history. "That bill would have clobbered us," says Jamieson.

Oil executives maintain that any excess profits tax that reduces oil company returns below last year's levels will prompt the companies to cut the big capital spending budgets that they have just approved. "If they are going to put the screws to us, the development work we are planning won't be done," fumes Continental's Hardesty. "That's not a threat—it's economic realism."

This furor has helped to produce several alternative proposals that would exempt from an excess profits tax any earnings that a company reinvests in producing domestic energy. "I want to be sure that the tax will not limit investment in developing reserves," says

Oil's rate of return makes a sudden leap



Data: Federal Trade Commission

leaving the oil giants in the role of hired agents to produce oil for OPEC and to ship and refine the oil for the consuming countries.

Cut out of a business

Initially, the trend threatens to push the oil companies out of wholesaling crude between the Middle East and the state-owned oil companies, independent refiners, and other bulk purchasers. This business accounts for about 20% of the oil that the companies take out of the Middle East; they feed the

The dramatic jump in Middle East crude prices

Period	Posted price*	Arab tax	Total cost (production cost plus tax)
1960-65	\$1.80	\$0.82	\$0.92
1966-67	1.80	0.85	0.95
1968-69	1.80	0.88	0.98
Jan. 1—Nov. 14, 1970	1.80	0.91	1.01
Nov. 15, 1970—Feb. 4, 1971	1.80	0.99	1.10
Feb. 15—May 31, 1971	2.18	1.26	1.37
June 1, 1971—Jan. 19, 1972	2.28	1.32	1.43
Jan. 20, 1972—Jan. 1, 1973	2.48	1.44	1.55
Jan. 1—Mar. 31, 1973	2.59	1.51	1.62
Apr. 1—May 31, 1973	2.75	1.61	1.71
June, 1973	2.90	1.70	1.80
July, 1973	2.95	1.74	1.84
Aug., 1973	3.07	1.80	1.90
Oct. 1—Oct. 15, 1973	3.01	1.77	1.87
Oct. 16—Dec. 31, 1973	5.12	3.05	3.15
Jan. 1, 1974	11.56	7.00	7.10

*Posted price is the base on which OPEC countries figure their tax; it bears little relationship to the producers' selling price.

Data: International Crude Oil & Product Review

AGO 530068

• **Representative Wilbur Mills (D-Ark.)**, chairman of the House Ways & Means Committee. "If they increase spending, they should avoid the tax." But some critics see a major flaw in this so-called plowback provision. A Congressional aide observes: "It virtually mandates that they spend their profits to avoid the tax, and it could mean plowing money into more corporate jets and other wasteful things."

While many oilmen say they could live with a tax that included a plowback provision, some are still leery of it. Says Maurice F. Granville, chairman of Texaco, Inc.: "We're not naive enough to think that a plowback provision would be flexible enough to allow us to counter the excess profits tax with a reasonable capital investment program." The plowback provision, he says, is sure to be restricted to certain types of investment.

Many oil executives protest that there is no reason for an excess profits tax at all. "Our returns are just pulling even with the rest of American industry," Gulf's Dorsey argues. "If that's an excess profit, I'll eat my hat."

Rougher tax treatment?

There is also mounting pressure in Congress to grasp this moment to make broad-based reforms in the tax treatment of oil, the least taxed of all industries. Senator Henry Jackson (D-Wash.) has in mind a major reform package that would deal with oil's three major tax breaks: deduction of drilling costs, the foreign tax credit, and the 22% depletion allowance. Some argue that, rather than imposing an excess profits tax, depletion and drilling deductions should be dropped entirely. These tax breaks, they say, are no longer needed as an incentive for drilling.

Indeed, the industry's own attachment to the depletion allowance may be weakening. Last December, Thornton F. Bradshaw, president of Atlantic Richfield Co., recommended that the allowance be scrapped in exchange for free-market pricing. "It's an albatross around our neck, and far more trouble than it's worth," Bradshaw said. Critics retort that this is hardly a concession, because free-market oil prices would be high enough to more than compensate oilmen for the 50¢ a bbl. that the depletion allowance is worth to them.

Some independent oilmen, however, were furious at Bradshaw for making the proposal. Unlike major oil companies, the independents attract much of their drilling capital from wealthy outside investors. Without the quick depletion write-off, they say, much of that money would dry up. "A higher price for crude oil doesn't shelter an outside investor who is taking a flier in

oil to get a tax write-off," declares Houston independent George Mitchell. And elimination of the drilling deduction, he claims, would lead independents to cancel at least half of their drilling plans for this year.

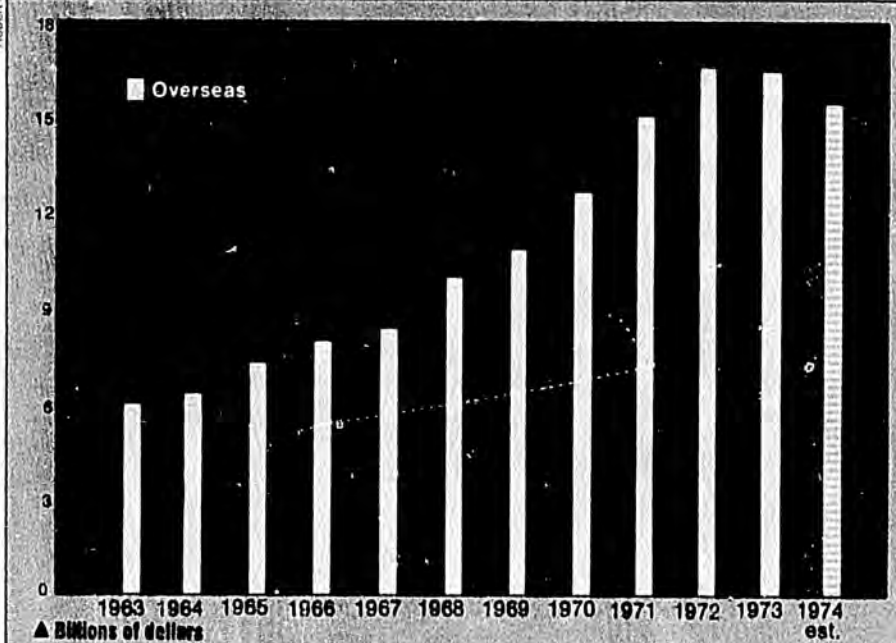
Also under attack is the foreign tax credit under which U.S. taxes due on foreign earnings can be offset by tax payments to OPEC countries for crude oil. All industries receive credits for taxes paid abroad, but critics argue that, with tax payments to OPEC running four times what they were last year, the tax credit will more than wipe out oil's U.S. tax liability on foreign income.

The industry's response to such reform proposals has a common theme. "If they take away a tax benefit and decrease our profits, then we can't raise enough capital," declares Exxon's

box and talk about going back to a free market," Shell's Bridges concedes, "would be political suicide—the surest way to be nationalized."

Increased regulation will probably also force oil companies to provide the government with much more information about their operations. That process has already begun. A dozen Congressional committees are investigating the industry, including Jackson's permanent investigations subcommittee. Last week's fiery session was only the beginning of a much deeper probe that committee staffers hope will rival some of the committee's hearings on labor racketeering. To some oilmen, the accusatory manner of questioning last week bore a resemblance to the rackets hearings. "For God's sake," cries Mobil's Warner, "we're being treated like criminals."

Oil's capital spending: First signs of a shift to the U.S.



Data: Chase Manhattan Bank; BW est.

Jamieson. "Do they want an oil industry that is profitable enough to do the job, or not?"

Surely more regulation

Already, in the present oil shortage, the federal government is advising refineries what products to make. And it is possible that when the shortage eases, the oil companies will face even more government regulation.

For openers, Jackson last week proposed a rollback in the soaring prices of domestic crude oil. Surprisingly, some oilmen are talking about the need for controls to keep oil prices from going too high. "For us to stand on our soap-

The committee investigations will probably lead to more formal reporting systems. Jackson and Senator Gaylord Nelson (D-Wis.) are co-authors of a bill calling for creation of a Bureau of Energy Information, which would collect and verify the profits, costs, reserves, production figures, and inventories of energy companies.

Some congressmen are even demanding that oil be regulated much like a utility. Under a major bill to be introduced by Jackson soon, all large oil companies would be chartered by a federal agency. This body would not regulate prices but would prescribe certain principles of operation, put one public member on the board of each



company, and possibly require prior clearance of major oil company actions, such as acquisitions and any withdrawal from markets. Jamieson says of the bill: "It would produce a rigid system of operation in our business and eliminate the benefit of individual companies testing different ideas."

The most extreme Congressional threats to oil are the measures designed to make the industry more competitive by changing its structure. Only a few months ago, oil executives believed such action was very remote, but the anti-oil mood in Congress has them taking the proposals seriously now. According to the critics, total integration of the major oil companies—their involvement in crude oil production, pipelines, refining, and marketing—has produced an anti-competitive structure. Critics point to product exchange agreements and joint exploration efforts as anti-competitive practices, and they charge that the majors have the power to set artificially high prices on crude oil, where their control is greatest. That allows them, the argument goes, to take most of their profits in that segment of the business while maintaining very low margins in refining and marketing to restrain competition there.

Some members of Congress put enough stock in such charges to push harder for bills that would promote competition in the oil industry. One such bill, sponsored by Senator Adlai E. Stevenson III (D-Ill.), would set up a federal oil and gas corporation that would get free leases to explore federal acreage that had the best prospects. The oil that it produced would go to independent refiners, few of which have their own sources of crude. Says Stevenson: "Most of our oil—about 70%—is located under public lands, and I want to see it developed to benefit the public, not just the oil industry."

Stevenson believes that in the angry mood of Congress his bill's chances have gone from zero to very good in the last few months. Says he: "If the oil industry had any sense, it would support the bill—and head off utility regulation." But the industry is not about to take that kind of advice. Oilmen argue that a federal oil company would be inefficient and would be guided by political consideration. Says Continental's Hardesty: "Unmask the idea for what it is—the first step toward nationalization of oil."

Breaking up the majors

Meanwhile, a far more serious threat is taking shape: a plan to break the majors up into separate producing, refin-

ing, transporting, and marketing companies. Already the states of Florida and Connecticut have filed antitrust suits against the majors, charging that they used their control over all segments of the business to squeeze out the independents. The two states seek court orders breaking up the giants. Colorado, Minnesota, and several others are considering similar suits. And last summer the Federal Trade Commission brought suit against eight majors, making much the same charges; FTC staffers suggest one objective is to seek some form of divestiture.

Antitrust law holds a precedent for such a move: the antitrust cases of 1948 that split apart the production and distribution segments of the movie industry. But litigation of this issue could take upward of seven years, and many in Congress are seeking faster action against the oil majors. Four different bills have been introduced that call for the oil giants to divest themselves of one or more parts of their business in order to stimulate more competition in the oil industry.

"If you broke the majors into separate segments, it would introduce an arm's-length bargaining between different levels that does not exist at the present time," says Charles Bangert, general counsel of the Senate antitrust and monopoly subcommittee. "There would be competitive bidding for crude oil by refiners, and for refined products by marketers."

"Right now," he adds, "people are so mad at the oil companies that the chances of such divorce legislation are pretty good."

To fend off such legislative challenges, the oil companies are working fast to improve what has overnight become the worst image in American business. A Gallup poll taken last month indicated that more Americans (25% of the sample) blame the oil companies for the shortages than any other possible cause, including the Arabs.

In dealing with their image problem, the companies are having second thoughts about the industry's deep-rooted secrecy. Oilmen in the past may have talked freely to an uncritical trade press, but they seldom were willing to discuss their business with the general press and the public.

"We became members of an introspective group and talked only to each other," confesses Murphy of Inxco Oil. "We made the serious mistake of agreeing that the real villains had to be guys like Senator Proxmire and that if he and others would not appreciate the great job we were doing, then to hell with them."

A public-be-damned attitude was

fostered by the industry's close ties with such one-time powers in Congress as Sam Rayburn, Lyndon Johnson, and Robert Kerr, all from oil-producing states. "We were lulled into a false security in those days," Continental's Hardesty explains, "because we knew that the leaders in Congress understood our business. We reacted far too slowly when Congress changed and all of a sudden we had to deal with people who didn't understand us." The chairman of another major adds: "Whenever we got into trouble, we always went to Sam and Lyndon to get us out. We never prepared for the day when the liberals would be in charge in Congress. That day has come."

Wooling public opinion

Ironically, despite the charge of conspiratorial togetherness, one of the industry's big public-image problems has been its internal divisiveness. Oilmen lately have not only debated such things as Arco's stand on depletion allowances but have also sharply disagreed on the wisdom of making unleaded gasoline and the merits of trying to make the U.S. self-sufficient in energy. And because their companies have different status in oil reserves, they have argued the relative merits of coal gasification, importing LNG, and developing oil shale. "We have a wide divergence of views and lack a common voice," says Jamieson. "It confuses Congress and the public about what we want."

Today, the industry can no longer be accused of being secretive. For the first time ever, the majors are revealing inventory statistics that once were guarded as competitive secrets. Last week they held press conferences for the first time to explain their earnings. In fact, much of an oil executive's time these days is spent in interviews with the media.

Oilmen are now convinced that, more than ever, they must win the public's favor. Energy shortages have a major impact on the lives of people, and it is already clear that how Congress handles the industry depends on the views of the constituents back home. If oil is to retain its big profits and avert government interference with its effort to cash in on new opportunities, it must first convince people that today's shortages are real and not contrived. Then it must show that the way to solve the shortages is to protect the incentives that have now developed. Even this year's profit increase, they must show, is a better price to pay than the alternative cost of a long-range energy drought.

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The new shape of the U.S. oil industry

The good profit news coming out of the headquarters of U.S. oil companies this week is turning into a monumental problem for oil executives almost as fast as they issue it. Last year's profits for the top 10 companies in the industry were the best in half a decade—up 51.2% over 1972 to a total of \$7.8-billion. But the good performance has triggered a massive storm of criticism from consumers and Congress, and the storm is generating demands for stringent legislation to curb the oil companies' operations.

The exhortations for regulation, for tax reform, for splitting up of the companies, and even for establishment of a national oil company could not come at a worse time for the oil industry. For oil is already caught up in a violent revolution that is changing not only the way that the companies do business but also the structure of the industry and its economics.

"The Arab oil embargo has produced a revolutionary change," declares Rawleigh Warner, Jr., chairman of Mobil Oil Co. "It is questionable whether we'll get the ever-increasing volume of oil out of the Middle East that we were counting on. And suddenly we're having to pay prices we didn't think we would have to pay until the 1980s."

One conclusion that the public jumped to was that oil's sudden wealth resulted from the Nixon Administration's decision to permit big oil price rises as a way to alleviate fuel shortages. But that accounts for only a small part of oil's huge profits jump in 1973. In fact, the bulk of the rise stemmed from strengthening prices in Europe, where U.S.-based international oil companies have a big share of the market. This was a sudden turn. As recently as 1971 there was an oil glut on the Continent, and over-supply drove prices to profitless levels.

A far smaller part of the profit increase can be traced to the gains that U.S.-based oil companies were able to make, on an accounting basis, for the

devaluation of the dollar. Increased profits made in marks in West Germany, for example, were further fattened when they were transferred into dollars, because the value of the mark rose from 31¢ in 1972 to as much as 42¢ last summer. Exxon Corp., for one, estimates that \$120-million of its \$2.4-billion profit came from this source.

The critical problems

The swing that took place in Europe last year and helped produce the big jump in profits is only the start of the radical changes in store for U.S. oil producers. These changes look different to different companies, because each company has its own strengths and weaknesses and its own strategy. The major internationals have one set of problems, the domestics have another. Those internationals that have a high percentage of their crude oil coming from the Middle East, such as Gulf Oil Corp. and Standard Oil Co. of California, have a different set of problems from those of Exxon, which gets a far lower percentage of its oil from that area. But there are some critical problems that everyone in the U.S. oil business has to cope with:

- Finding huge sums of money needed to explore for new sources of oil, build synthetic oil plants that process shale or tar sands, construct coal gasification and liquefaction plants, build new pipelines, and expand refining capacity. The industry figures it needs to raise \$800-billion for capital spending from 1970 through 1985, four times its capital outlay during the previous 15 years.

- Responding to a dual threat that promises to end the dominance of the U.S.-based majors in the overseas oil business. The oil-producing countries are accelerating the pace at which they are determined to become majority owners of their resources. And the oil-consuming countries, frantic to secure their supplies, are making govern-

ment-to-government deals with the Arab states, which may undercut the U.S. oil giants' role as suppliers to Europe and Japan.

- Warding off punitive legislation in the U.S. that would cut profits, end the depletion allowance, bring oil companies under regulation, split up the major companies, establish a national oil company. Today, the oil industry is facing the greatest threat from Washington since the breakup of the Standard Oil monopoly 63 years ago.

Polishing a public image

To counter the legislative threats, the oil companies are making adjustments on still another front: their approach to the public and the press. To improve their battered public image they are mounting a massive public relations effort that promises to open up what has been one of the most secretive of all industries. Says J. Kenneth Jamieson, chairman of Exxon: "We are embarking on the oil industry's version of Project Candor."

The first order of business will be to justify the huge increase in 1973 earnings. For 30 oil companies whose performance is charted by the Chase Manhattan Bank, earnings on foreign operations nearly doubled from \$3.2-billion in 1972 to an estimated \$6.1-billion last year, while domestic oil earnings merely crept up from \$3.6-billion to about \$4.4-billion.

By contrast, this year the companies will get their big profits from the U.S., and this will add to the furor in Congress. The price of domestic oil from established wells has risen in the last year from \$3.50 to \$5.25 a bbl., and the profit on it has jumped from around 75¢ to \$2.25. Oil from newly discovered wells was freed from controls last August, and oil from marginal stripper wells was decontrolled last December. Last month, the price of this oil soared to \$10 a bbl., producing profits as high as \$6.50. With about 30% of U.S. pro-

The ideo of January

The premise of the January indicator is simple: If the stock market rises in January, it will be up for the year; if it goes down in January, it will be down for the year. Unfortunately, January's trend at mid-week was still unclear. So here is a handy do-it-yourself kit for forecasting the 1974 stock market:

The Dow finished 1973 at 850.86. The S&P 500 closed at 97.35. This year will be an up year (according to the theory) if the averages finish the month higher. It will be a down year if they close lower. If one ends up lower and the other ends up higher—well, you can flip a coin.

On target. The January indicator has had an extraordinary record of accuracy. Last year, the Dow dropped 2.1% in January—and the market finished 1973 down 16.6%. Since 1950, in fact, the indicator has missed only four times. The Dow was down 3.6% in January, 1956, but finished up 2.6% after a seesaw year. It was up 0.5% in the first month of 1966 but then plunged and closed off 13.1%. January, 1968, was down more than 4%, but the market later boomed. The year 1970 was an ambiguous case: The Dow fell 7.6% in January, and the market collapsed through May. But by yearend it had recovered and closed virtually even.

The 'lame duck' theory. No one has any clear explanation why the indicator works. But Yale Hirsch, who publishes both the *Stock Trader's Almanac* and an investment letter called *Smart Money*, offers an interesting notion. Hirsch studied the S&P 500 going back to 1901 and found that during the first third of the century, January prefigured the rest of the year 16 times, but failed 17 times, a random pattern. Since 1934, though, the January indicator has been right 32 out of 40 years—or 80% of the time, a record that other indicators would be hard pressed to beat.

The difference, Hirsch suggests, was the 20th Amendment—the so-called "Lame Duck" Amendment—ratified in 1933. Before then, new members of the Senate and House, elected in November, did not take office until December of the following year, which meant that "lame duck" congressmen re-

mained in office another 13 months. In 1934, Congress—and its new members—began convening, and setting goals and priorities, early in January. Then, too, Hirsch points out, "the President gives his State of the Union message and presents the budget in January." And since the 1930s, of course, federal spending has had an enormous influence over the U. S. economy.

"It seems likely," Hirsch judges, "that if these events were switched to another month or occurred at different times each year, the January indicator would lose its effectiveness." This year, the State of the Union address was scheduled for Jan. 30—which may be one reason why the stock market has been so trendless the past month. Indeed, 1974 may see the advent of the February indicator.

The energy in Dynalelectron

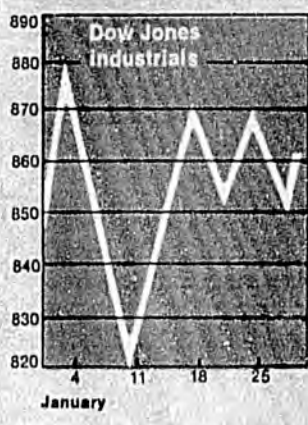
Dynalelectron was once dynamite. Speculators in 1967 hypoed the stock nearly 1,000% on the Amex, from 3½ to 34½. The shares have languished since. In December they traded as low as 2½. But last week the stock popped up on the Amex's most-active list and leaped to 6½—a sign that money is moving into Dynalelectron again.

Investors are discovering that the company is no longer largely a military aircraft and missile maintenance operation. Rather, they see it as a capital-spending play, with an energy angle thrown in. Says Ivy Fund's Paul Fenton, who bought 240,000 shares for the fund last year: "That makes an interesting package in today's market environment."

Dynalelectron's sales of some \$100-million are double what they were in 1967, and defense contracts now contribute only a third. The company has been buying up electrical contractors for civilian projects from office buildings to power plants, and this is now half of Dynalelectron's business. Further, its Hydrocarbon Research subsidiary holds slews of patents on hydrocarbon processes. Two are of special interest. A desulphurization process called H-Oil, jointly owned with Cities Service, is now used in three refineries (a fourth, run by Exxon, blew up in 1970; Exxon is now suing Dynalelectron). Another is a coal liquefaction process called H-Coal. The company is asking the Office of Coal Research for money to start a pilot plant.

Still, the stock isn't likely to repeat its 1967 performance. The hydrocarbon processes, less than 5% of revenues, have yet to show a profit, and other profit margins, though rising, are none too hot: Return on sales last year was running 1.7%, up from 1% the year before. But backlog was a healthy \$71-million. Fenton expects the company to report earnings of 25¢ to 30¢ a share for 1973, up from 12¢ in 1972, and to earn 40¢ a share this year.

The January indicator hangs in the balance



Data: Dow Jones & Co.

Citibank sees money, supply problems for oil

THE WORLD'S major oil companies are improving their earnings position and their degree of self-sufficiency in crude supply, but still face some stiff financial and supply problems, according to New York's First National City Bank.

Citibank says oil-company earnings in the U.S. rose sharply in 1972 (see table), but says an analysis of the 10 years ending in 1972 shows domestic oil companies earned a return of only 11.8% based on after-tax net worth compared to 12.3% for other manufacturing industries.

"Any attempt to anchor profitability to that level during a period when the need for increased investment is paramount should be unthinkable," the bank says in its latest quarterly energy memo.

Long-term problems. The bank

points out industry must look beyond the current earning picture to the years ahead when the amount of money oil companies must spend will be "drastically increased."

A study completed just before the 1973 oil embargo showed petroleum companies in the non-Communist world will have to invest annually \$125 billion by the end of the 70's to meet supply requirements. But this figure is outdated "both because of the accelerating pace of inflation and because of the urgent need to develop new sources of energy at much higher costs," Citibank says.

Supply shaky. Citibank warns against complacency in supply even though the embargo has ended. The bank says gasoline shortages this summer are "inevitable," adding that "winters may not be so kind as they

were this year in both Europe and North America."

Government support will be needed in the years ahead if importing countries are to reduce "the perils of energy starvation."

The bank says a new yardstick for measuring self-sufficiency will have to be developed due to the participation agreements being hammered out in the Middle East.

"The progressive breakdown of the former worldwide patterns of integrated production and refining will make it more necessary than ever to establish new hydrocarbon sources in each major consuming region and to resist the temptation to assume that the recent easing of supplies will allow consuming countries to return to the earlier era of plentiful, low-cost petroleum imports," the bank says.

Income and crude sufficiency figures for 30 integrated firms

Companies	Net income				Production as percent of runs							
	\$ Million		% change 1972/1973	U.S.		Other West.		East.		Total		
	1962	1972		1962	1972	1962	1972	1962	1972	1962	1972	
FIVE LARGEST INTERNATIONAL COMPANIES												
Exxon	822	1,532	2,440	59.3	65.2	94.3	97.7	106.4	73.2	93.8	81.1	97.3
Texaco	472	889	1,292	45.3	77.8	78.3	60.6	57.0	177.3	199.8	100.5	127.9
Gulf	340	447	800	79.0	70.7	73.1	108.9	69.5	510.7	327.1	175.5	165.2
California Standard	291	547	844	54.3	73.3	56.7	204.5	68.3	176.1	249.5	121.2	154.3
Mobil	242	574	843	46.9	36.8	46.0	225.0	197.4	90.0	102.0	67.9	85.5
Subtotal	2,167	3,989	6,219	55.9	64.4	71.0	98.0	90.4	142.9	161.4	99.2	119.2
FIVE OTHER LARGE INTERNATIONAL COMPANIES												
British Petroleum	194	176	760	331.8			215.0	36.3	145.2	196.6	146.6	191.3
Royal Dutch/Shell (excl. U.S.A.)	470	525	1,550	195.2			112.5	86.4	47.7	82.1	69.9	83.1
Cie. Francaise des Pétroles	45	113	155	37.2				200.0	144.2	133.8	144.8	132.4
Ente Nazionale Idrocarburi	5	39	64	64.1					55.3	53.9	55.3	53.9
Petrolina (excl. U.S.A.)	17	58	71	22.4			34.5	32.8	5.3	8.5	9.1	12.6
Subtotal	731	911	2,600	185.4			112.5	80.5	89.0	120.7	93.8	115.0
TWENTY OTHER INTEGRATED U.S. COMPANIES												
Indiana Standard	162	375	511	36.3	45.8	50.9				164.2	54.9	78.6
Atlantic Richfield	113	193	270	39.9	63.7	56.2	661.9	435.5	150.0	1,450.0	89.8	86.6
Shell	158	260	333	28.1	65.0	63.7					65.0	63.7
Continental	73	170	243	42.9	85.5	64.9			575.0	171.2	113.7	115.5
Sun	89	155	230	48.4	51.7	69.0		123.6	250.0	300.0	74.2	85.4
Occidental	26	20	80	300.0						400.0		407.5
Marathon	38	80	129	61.3	86.5	78.4				280.7	107.5	135.0
Union	77	122	180	47.5	49.6	72.4		716.7			56.5	86.5
Phillips	107	148	230	55.4	58.2	49.2	1,050.0	480.0	163.6	87.0	73.6	59.6
Getty (excl. Skelly)	29	39	91	133.3	56.7	258.9			174.6	313.9	83.7	280.7
Amerada Hess	39	46	246	434.8	120.6	131.9		5.4			160.3	52.0
Cities Service	65	99	136	37.4	49.0	83.4	64.7				50.0	87.6
Tenneco	56	203	230	13.3	117.2	95.6					151.7	110.0
Skelly	22	38	44	15.8	122.8	110.0					124.6	111.3
Ohio Standard	24	60	74	23.3	19.1	7.5			600.0	900.0	28.2	12.4
Murphy	3	14	49	250.0	26.5	23.6		45.0		69.7	42.1	39.2
Ashland	17	68	85	25.0	10.9	7.3			250.0		22.8	12.8
Pennzoil	34	59	84	42.4	380.0	127.3					380.0	127.3
Kerr-McGee	22	51	63	23.5	31.3	105.0					40.6	110.8
American Petrofina	1	18	37	105.6	20.5	20.6					20.5	20.6
Subtotal	1,155	2,218	3,345	50.8	57.5	59.1	1,119.0	131.6	205.1	268.4	71.6	81.4
GRAND TOTAL	4,053	7,118	12,164	70.9	60.5	64.0	117.2	93.0	114.6	145.8	90.4	108.8

769 bbl from Tunisia, and 1,227,058 bbl from Libya.

Imports from Saudi Arabia peaked in October at 23 million bbl, and started downward immediately after the embargo was announced.

Other shipments. During the same period, Iran shipped greater volumes, ranging from 11 million bbl in November to 9.8 million in December, 13.5 million in January, and 11.8 million in February. During October, Iran supplied only 7.5 million bbl to the U.S.

Venezuela also helped to take up the slack, supplying 15.5 million bbl in November, 19 million in December, 17 million in January, and 11.8 million in February. This didn't count Venezuelan-source crude refined in the Caribbean and shipped as products to the U.S.

During the embargo Indonesia also stepped up shipments to the U.S., as exports from that country rose from 4.8 million bbl in October to a peak of 9.9 million bbl in February.

Venezuela cuts crude production by 160,000 b/d

THE Venezuelan Government last week imposed a 5% cutback on crude-oil production, due, it said, to lack of facilities to process associated-gas production.

The cutback amounts to about 160,000 b/d.

Creole Petroleum Corp., affiliate of Exxon Corp., which produces about 1.6 million b/d, says its foreign oil sales will be cut by about 100,000 b/d.

Royal Dutch/Shell's Shell de Venezuela produces about 800,000 b/d of Venezuela's total output of about 3.3 million b/d.

In addition, the government's state-owned CVP was slated Apr. 8 to begin taking about 100,000 b/d of royalty crude in kind.

Of this amount, Creole and Shell will be turning over an aggregate of about 70,000 b/d to CVP, which intends to market the crude to its own customers.

CVP has not disclosed its potential customers but has previously said it would sell oil to other Latin American countries. Mexico and Peru are believed to be among potential customers.

Qaddafi's status change seen improving Libyan oil situation

THE changes in the Libyan Revolutionary Council had oil observers puzzled last week, but overall it was felt that the relieving of Col. Qaddafi of his policy-making role will prove a step toward improved Libyan foreign relations and economic policy.

Qaddafi remains as head of state and commander-in-chief of the armed forces, but reports from Tripoli say he will devote his time to matters of "ideology and organization."

The command council is reportedly unhappy over the way Qaddafi has isolated Libya from the rest of the Arab world by his actions and threats to more conservative Arab regimes.

His abortive wooing of Egypt and Tunisia to merge with Libya did not help his public image.

Prime Minister Major Abdesalam Jallud now assumes all responsibilities for policy making. Jallud is known as a much more practical and liberal politician than his chief of state. He

has played a major role in Libyan oil negotiations over the past few years.

Beirut newspaper An Nahar disclosed that Qaddafi's colleagues on the command council had been openly critical of his policies, calling them "moody" and dictated by emotion. They are concerned over his estrangement of Libya on both Arab and international levels, the paper said.

That estrangement worsened last February, when Qaddafi called on the Arab "masses" of every African and Middle Eastern state to declare a "bloody revolution."

Libyan Minister of Information Abu Zeid Dordeh said the changes are "mere formalities."

"The appointment of Jallud to undertake administrative and political functions was the result of a decision taken by Qaddafi himself," Dordeh said, "Because he wanted to devote himself to the armed forces and matters of ideology."

Simon opposes rollback of stripper-well crude prices

FREE-MARKET prices for stripper-well production shouldn't be rolled back or otherwise controlled, Energy Czar William E. Simon says.

His support should go a long way in preserving existing price treatment for leases whose average daily production for the preceding calendar year doesn't exceed 10 b/d per well. In a letter to Sen. Paul J. Fannin (R-Ariz.), ranking Republican on the Senate interior committee, Simon noted that Congress has twice voted legislation exempting stripper wells from price controls.

Simon says market prices for stripper oil are preventing premature abandonment among the 360,000 stripper wells producing an average of 3.5 b/d and are "paying additional dividends." Remedial work could add another 200,000 b/d or more to U.S. crude supplies, he said.

His strong support for the stripper exemption was in contrast to congressional testimony by Charles Owens,

deputy FEO administrator who has had a key role in oil-pricing policy—first at CLC and now FEO. Owens referred to "the supply depressing potential of the stripper-well exemption."

The gap between the price of old and new oil is "an inducement to non-stripper well operators to reduce their production of 'old' crude from wells that are only marginally above the stripper level of production," Owens said. He suggested there is a large potential for this kind of "gamesmanship," in order to get leases down into the stripper category to qualify for higher prices.

But that's impossible under current FEO regulations, Sen. Dewey F. Bartlett (R-Okla.) declared in a stiff letter to Owens. In order to do what Owens suggested, Bartlett said, an operator would have to reduce his lease output for the entire year of 1974 in hopes that in 1975 the current rules would still apply.

PLEASE NOTE: THE PRECEDING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.

PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
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Top oil firms' 1973 profits jump 52.7%

Leading 25 companies report earnings of more than \$9.4 billion. Big percentage gains follow a year when profitability hit a 10-year low. Profits from abroad are a major contributor to the companies' coffers.

TO THE SURPRISE of no one, the larger American oil companies dramatically turned around their profit performance in 1973 following a lackluster showing the year before.

When Gulf Oil Corp. finally came in with its report last week, the completed Oil and Gas Journal survey showed that the leading companies earned more than \$9.4 billion in 1973, an increase of 52.7% over 1972 when profits of the same companies had dropped.

The final showing for the year had been signaled earlier by excellent first half and third-quarter earnings. The fourth-quarter performance was even better with an increase of nearly 70%.

Politicians and consumer advocates had anticipated the big jump in earnings and early greeted scattered announcements of individual companies with an outburst of demands before Congress for new tough regulations on industry operations.

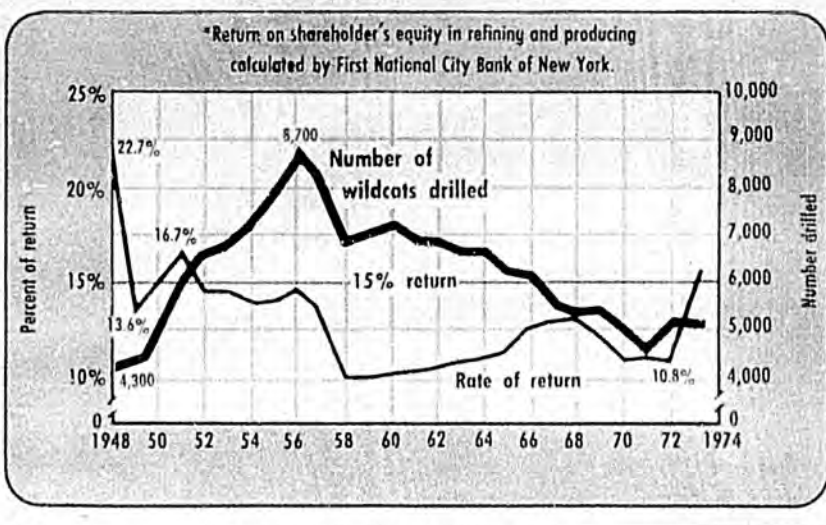
As the accompanying table clearly shows, the profits gains were spread throughout the list. The so-called five international giants performed slightly better than the predominantly domestic firms.

Led by Exxon with earnings of \$2.4 billion and Texaco at \$1.29 billion, the five pushed profits up 55% to a total of \$6.21 billion. The other three were closely grouped with California Standard at \$843 million, Mobil \$842 million, and Gulf \$800 million. The domestic-oriented companies, many of whom also have foreign holdings, averaged increasing earnings by 47.9% for a total of \$3.26 billion.

Behind the earnings. The charges of price gouging and excess profits directed at oil companies, however, ignore the many factors that contributed to improved earnings, the past years of relatively low earnings, and the relation of oil profits to those of other industries.

Large percentage gains for oil company 1973 profits are due to comparison with depressed earnings the year before when profitability of U.S. oil firms hit a 10-year low. Federal Trade Commission statistics show that earn-

How wildcatting follows profits*



ings of all oil companies in 1972 were down 10% following a profits dip of 2% in 1971 and practically no change in 1970. This 4-year performance is the basis of claims by oil executives that 1973 earnings represent "catch up."

The First National City Bank of New York reports that the profits of oil corporations showed an average annual gain of 10.5% during the period 1968-72 while those of all manufacturing companies averaged 10.7%. The gains of both have been about 50% over the 1971-73 period.

The return on net assets also has been relatively close. In 1972, oil companies earned 10.8% on net assets while other manufacturing earned 12.5%. In 1973, the return for oil companies is expected slightly to exceed 15%, while those of other manufacturers will top 14%. (For details on Treasury Department study of returns on equity in oil, see p. 38.)

A major feature of 1973 earnings for the larger companies was the heavy contribution of profits from abroad while domestic profits failed to keep pace. Exxon reported U.S. earnings rose 16% last year while those in the Eastern Hemisphere were up 86%. Texaco showed an increase of 86% abroad and 3.6% in this country, and

Mobil a 70% increase abroad and 15% in the U.S. In at least one instance—Marathon—domestic earnings dipped slightly with all the increase attributable to foreign operations. And Sun's domestic marketing and refinery profits declined. Preliminary reports indicate that foreign earnings of the major internationals will be up 75% with domestic earnings up only 12%.

Dollar devaluation figures in. The foreign earnings may be deceiving, however. An important factor in the increase was devaluation of the dollar in 1973. Since U.S. companies keep their books in dollars, high earnings in foreign currency translate into more dollars.

The chief reason for the jump in foreign profits was stepped up production worldwide, near-capacity refinery operations, and product sales at better margins. This was a sharp switch from the last few years which have been characterized by depressed markets and low profitability, especially in Western Europe. The Arab embargo came too late in the year and was not immediately effective enough to change the profits trends.

Companies with predominately domestic operations also shared in the upswing of industry profits, although perhaps not as much as those with

which jumped from \$2.12/bbl for a sale of Arabian light crude cargo last September to more than \$15 last November, only to slip to \$10-11 by the end of January. A continuation of prices at these levels is unlikely, in Simon's view. Considering efforts to reduce consumption around the world, "the potential clearly exists for spot market prices to continue to decline."

Simon's advisers expect 1974 non-Communist consumption to be around 46.4 million b/d, if world prices are consistent with \$8.50/bbl for Arabian light, rather than the 51.4 million b/d forecast before the October 1973 Arab-Israeli war. If prices fall to \$4.50, the forecast consumption rises to 50.3 million b/d, plus 200 million bbl in inventory buildup.

At either of these illustrative prices, U.S. energy experts believe productive capacity will not be fully employed. Whether some producing countries will choose to keep capacity idle, losing revenue, is an open question.

The message Simon is trying to sell to producing nations is this: produce more now, at lower prices, invest the surplus revenues, and reap the dividends.

Project Independence. Simon lifted the veil from still more of the goals of domestic energy development.

Conservation has a high priority, with projected savings of up to 7 million b/d by cutting demand growth in half.

Expansion of oil and gas production, with emphasis on the Outer Continental Shelf and the North Slope of Alaska, is another major thrust. The trebling of OCS leasing has the potential for boosting offshore production to 10 billion bbl of oil and 28 trillion cu ft of natural gas by 1986, the Interior Department estimates. The OCS is assigned 42%—160 billion bbl of oil equivalent—of the remaining discoverable oil and gas in the U.S.

The North Slope will be producing 2 million b/d by 1980, with the trans-Alaska pipeline operating at capacity. Simon places the North Slope potential at 80 billion bbl, capable of producing 5-6 million b/d.

Coal production may be trebled to 1,500-1,800 million tons annually by 1985, "emerging as a very central element in our energy picture." Simon sees savings of 6 million b/d of oil equivalent by 1985 through direct substitution of coal for oil and gas—2 million b/d by replacement of oil under utility boilers, 1 million b/d in



FEO's Simon
U.S. won't need the 10-12 million b/d
of imports projected for 1980.

residential and commercial space heating (primarily through heat pumps), and 3 million b/d in industry. Also, 3 million b/d of oil may be replaced by synthetic fuels—liquid and gaseous—from coal. Production of low-BTU gas from coal, rated marginal in the short range, is given a larger role in the longer-range future.

Simon is "especially encouraged by recent progress in the in situ processes for extracting shale oil at much less than the current cost of Persian Gulf crude." But no projections are given for this vast resource, which has not yet become commercial.

Nuclear power "could easily provide 10%" of U.S. energy needs by 1985.

Seven-point program. Access to nuclear and other U.S. energy technologies features the program offered by Kissinger to the major oil-consuming nations.

Kissinger advanced these seven points for coordination of energy policies among consumers:

Consumer-producer relations. "We must work toward the objective of preventing coercion of the weak by the strong—or of the strong by the weak; the producing nations must be given a secure stake in an expanding world economy, and the consuming nations a secure source of supply."

International financial cooperation. Producing nations will be called upon to help finance the higher oil-import bills of the developing consumer nations. There must also be new mechanisms to distribute international capital flows from oil-revenue surpluses, plus means for producers and

consumers to cooperate in building confidence in investment policies and the integrity of investments.

Less-developed countries. "The wealth of the producer nations opens up a potential new source of large-scale capital assistance for development." Also, urgent measures must be taken to assure adequate fertilizer supplies for the coming year, requiring "oil at a price that will allow existing fertilizer production capacity to be fully utilized."

Emergency sharing. "The United States declares its willingness to share available energy in times of emergency or prolonged shortages."

"We would be prepared to allocate an agreed portion of our total petroleum supply provided other consuming countries with indigenous production do likewise. As we move toward self-sufficiency, our ability for sharing would of course increase."

The formula should include criteria to determine when a shortage exists, a mechanism to implement and terminate sharing, and complementary programs such as stockpiling and standby rationing schemes.

Research and development. The U.S. plans to spend more than \$11 billion in federal funds in the next 5 years, with \$12.5 billion more in private funds to be invested in the same period. The U.S. is prepared to make a major contribution of its most advanced energy R&D to a broad program of international cooperation.

Alternate sources. The U.S. favors consumer cooperation in international programs to reduce vulnerability of major industrial nations to interruption and manipulation of supply—such as the orderly conversion of key sectors away from petroleum; collective commitment to develop fossil-fuel resources within our respective borders; coordinated policies to encourage the flow of private capital into new higher-cost energy industries such as synthetic oils and gas from coal and shale; and governmental arrangements to accelerate the global search for new sources such as offshore oil.

Conservation. The U.S. recognizes that it is "the world's most profligate energy consumer" and pledges a sustained effort to cut waste.

At the moment, the Kissinger program of cooperation, like Project Independence, is more rhetoric than action. But if both are pursued, they will mark turning points in U.S. and world energy policies.

interests abroad. Profit contributions were made by price increases in natural gas, crude oil, and products. Markets enjoyed stability as price wars faded and marketing costs dropped. Companies also benefitted from heavy production in both the field and plants until the effects of mid-October Arab embargo was felt late in the year.

Oil company executives in announcing 1973 earnings gave a more careful analysis of their operations than usual, and their comments are revealing. For example:

Texaco's Maurice F. Granville: "This strong upswing, especially in the latter part of 1973, followed a period of 4 years in which the company's returns on both gross income and total assets had been lagging behind the average returns of the past 10 years."

Mobil's Rawleigh Warner, Jr.: "The improvement . . . reflected recovery from the relatively low earnings from U.S. operations that characterized 1972 . . . reflected higher U.S. crude oil and natural-gas prices as well as a significant reduction in U.S. marketing expenses."

Union Oil's Fred L. Hartley: "Earnings increases were largely the result of increased foreign crude oil production, essentially 100% refinery throughput, increased sales of petroleum products, and stable prices—as compared to extensive price wars in prior years."

Atlantic Richfield's Robert O. Anderson: "Despite the improvement in 1973, after 3 years of depressed results, return on capital remained below the 8.6% earned in 1969."

Pennzoil's William C. Liedtke, Jr.: "The 1973 return on investment did not even equal the amount paid on insured savings and was less than half the prime lending rate."

Several executives equated their earnings on crude and products sales to a gallon, revealing that Exxon's earnings equalled 1.9¢/gal, Indiana Standard 2.5¢, Texaco and Atlantic Richfield 1.7¢, Gulf 1.5¢ and Continental 0.13¢.

The outlook. Executives throughout the industry are counting on 1974 being another profitable year and on that basis have budgeted a record total of capital funds for new facilities to expand supply.

Political uncertainties, however, may change this picture drastically. The outlook will depend on what happens to proposals for price rollbacks,

How 25 U.S. oil firms fared in 1973

Company	Thousands of dollars					
	Net profit*	Annual % change from 1972	% change 1972 vs. 1971	Net profit*	4th quarter % change from 1972	% change 1972 vs. 1971
Exxon	2,440,000	+ 59.3	+ 0.9	784,000	+ 59.0	+ 13.2
Texaco	1,292,403	+ 45.4	- 1.6	453,486	+ 70.1	+ 8.7
California Standard	843,600	+ 54.2	+ 7.0	283,100	+ 94.2	+ 12.8
Mobil	842,800	+ 46.8	+ 6.2	271,600	+ 68.2	+ 7.9
Gulf	800,000	+ 79.1	- 15.9	230,000	+ 98.3	+ 8.4
Subtotal	6,218,803	+ 55.0	- 0.5	2,022,186	+ 71.3	+ 10.9
Indiana Standard	511,200	+ 36.4	+ 10.0	121,400	+ 52.7	+ 14.0
Shell	332,694	+ 27.7	+ 6.5	79,394	- 1.5	- 9.3
Atlantic Richfield	270,185	+ 40.3	- 8.6	91,697	+ 47.4	+ 11.2
Continental	242,700	+ 42.6	+ 21.5	89,300	+ 91.6	+ 63.5
Phillips	230,400	+ 55.3	+ 12.2	86,700	+ 127.6	+ 5.2
Tenneco	230,212	+ 13.4	+ 9.9	80,920	+ 14.4	0
Sun	230,000	+ 48.4	+ 2.0	75,000	+ 59.6	+ 14.6
Amerada Hess	218,364	+ 177.3	- 65.3	104,490	+ 471.9	- 19.4
Union	180,200	+ 47.8	+ 6.3	51,000	+ 55.5	+ 7.5
Cities Service	135,600	+ 36.8	- 5.2	42,100	+ 49.8	+ 23.2
Getty†	135,032	+ 77.4	- 36.6	52,612	+ 115.0	- 13.6
Marathon	129,405	+ 62.2	- 10.1	46,946	+ 92.8	+ 17.8
Ashland§	85,219	+ 25.7	+ 64.5	34,400	+ 52.2	+ 15.3
Pennzoil	80,412	+ 37.1	+ 24.3	24,103	+ 68.4	+ 20.6
Ohio Standard	74,100	+ 24.1	+ 1.4	11,600	- 39.9	+ 4.9
Murphy	48,533	+ 239.9	+ 28.9	13,935	+ 181.0	+ 48.3
Skelly	43,983	+ 17.0	- 1.8	16,812	+ 31.3	+ 18.5
American Petrofina†	36,951	+ 104.6	+ 38.0	16,729	+ 218.2	+ 44.1
Clark	30,500	+ 265.6	+ 132.6	8,087	+ 140.8	+ 183.6
Tesoro§	19,874	+ 52.3	+ 70.1	12,580	+ 183.5	+ 37.3
Subtotal	3,265,564	+ 47.9	+ 0.4	1,059,805	+ 65.1	+ 12.9
TOTAL	9,484,367	+ 52.7	- 0.2	3,081,991	+ 69.9	+ 11.5

*Excludes nonrecurring gains and losses. †Includes Getty's share of Mission Corp. and Skelly Oil Co. §Includes revenue of Standard (Ohio) assets acquired July 1, 1973. §Fiscal year and first quarter.

excess profits taxes, ending percentage depletion, wiping out foreign-tax credits, and the workings of the allocation program.

Many analysts expect domestic operations to contribute more to company earnings this year. The full impact of higher crude-oil prices should be felt, especially for the independents and the larger companies with a good domestic production position. Foreign earnings should contribute relatively less, because of the rising strength of the dollar abroad. This will reverse the dollar-transfer gains enjoyed last year. If the Arab embargo continues for much of the year, this will limit production abroad and affect the downstream profits from refining and marketing. World production also could be depressed by skyrocketing oil prices which eventually are bound to curtail increases in demand.

A continued Arab embargo also will affect domestic operations. With refineries operating at only three-fourths capacity under crude allocations, unit costs will be much higher than at full

capacity. The same trend will be felt on distribution costs with products allocated or rationed.

The industry's 1974 preliminary capital-spending budget of more than \$19.5 billion for domestic projects (OGJ, Feb. 4, p. 29) was based on the high earnings of 1973 and cannot be sustained if earnings are restricted. Even though capital spending routinely exceeds earnings, the reinvested profits represent a sizable part of greater available capital funds. Indiana Standard and Sun, for example, reported 1974 capital-spending plans call for investing \$3 for every \$1 earned in 1973. Atlantic Richfield will invest \$1.78 for each \$1 of profit.

Exxon plans to spend \$16 billion on capital items over the next 4 years with about \$6 billion ticketed for 1974 alone. Texaco and Gulf have jumped their spending to \$2 billion, California Standard \$1.6 billion, Indiana Standard \$1.4 billion, Continental \$700 million, Union \$490 million, Phillips \$650 million, and Cities Service \$466 million. All represent substantial increases.

Bulk of the funds will be channeled into increasing exploration and production in this country or into projects seeking alternate energy sources.

Union President Hartley expressed the feelings of most company executives when he said "these earnings are not being salted away nor can they be considered a windfall for anyone. They—and more—are being plowed back into the business of exploring for and developing more and new energy sources . . . We are making this commitment in spite of the uncertainties of today's economic and political climate."

And Pennzoil President Liedtke observed that "actual results of 1974, as well as those for future years, will depend significantly upon the resolution of various governmental policy issues now being considered by the adminis-

tration and the Congress."

H. A. True, Jr., Wyoming independent operator and chairman of the National Petroleum Council, recently told the House ways and means committee that "the economic stage is set for successful expansion of the conventional and nonconventional domestic oil and gas industries."

Crude-oil and gas prices, he pointed out, have broken out of their postwar stagnation. Profitability is increasing to attractive levels. First generation synthetics plans are announced.

True declared he could not overestimate the significance of the industry's rate of return reaching the 15% level. It should be higher, he said. "The domestic oil industry's expansion after World War II began in earnest in 1948 when the rate of return was 22.7%. Thereafter, during the ex-

pansion years through 1956, rates of return ranged from 13.6% to 16.7% with an average of 14.6% (see chart).

"It was no coincidence that those years were a time of expansion. The number of new-field wildcats drilled rose from 4,300 in 1948 to 8,700 in 1956. Then, the rate of return fell off; and the number of wildcats drilled declined to a low of 4,500 in 1971. Hopefully, that decline has been arrested.

"We should be optimistic over the prospects of achieving ultimate energy independence. Yet the U.S. petroleum industry is being accused of profiteering and is being subjected to threats of price rollbacks and higher taxes—especially taxation of so-called 'excess' profits.

"Nothing could be better calculated to destroy the new economic environment."

U.S. drilling funds raise 10% less money in 1973

MONEY raised by U.S. public drilling funds dropped by a little more than 10% last year.

Resource Programs Inc. (RPI), New York research and advisory firm, reports that 70 funds raised \$346 million in 1973, off \$39 million from the previous year.

The 1973 total includes \$38 million raised under income programs that purchase producing properties rather than drill.

RPI attributes the decrease in 1973 funds to a growing trend toward privately sold programs. A number of firms responding to PRI's annual survey said they raised considerably more money privately than publicly last year.

In addition, fund raising was hurt by the absence of 200% write-off offerings.

Funds in 1973 were far short of the record \$419 million public offerings accounted for in 1969.

PRI's survey shows a considerable decline over the past few years in the number of firms which sold public programs. And fund raising by new sponsors has fallen sharply both in amount and as a percent of total sales.

Four companies sold \$20 million or more in public offerings last year.

Canadian-American Resources Fund Inc. took the top spot with sales of \$47.5 million, more than double its

Breakout of fund raisings by size in 1973

Size of fund raising†	Amount*				Percent			
	1970	1971	1972	1973	1970	1971	1972	1973
Up to \$1 million	27	23	23	14	9	7	6	4
\$1-3 million	76	64	66	76	26	19	17	22
\$3-5 million	41	62	50	64	14	18	13	18
\$5-10 million	40	101	106	65	14	29	28	19
\$10-25 million	107	64	140	79	37	19	36	23
Over \$25 million	—	29	—	48	—	8	—	14
Total	\$291	\$343	\$385	\$346	100	100	100	100
	1970	1971	1972	1973				
Number of firms raising totals shown	89	87	80	70				
Amount raised by new sponsors (millions)	\$52	\$49	\$46	\$17				
Percent of total	19	14	12	5				
Number of programs unsubscribed‡	36	22	16	7				
Number of programs filed	162	93	131	106				
Number of firms filing programs	126	73	88	76				

*Figures are original subscriptions and exclude assessments. Covers all programs registered with the SEC during the 1970-73 period. †Funds raised under multiple partnerships or ventures in one calendar year are considered a single fund raising. ‡Excludes programs withdrawn before becoming effective.

Source: Resource Programs Inc.

1972 sales of \$22.7 million. Conoco Management Co. sold \$25 million, the same as in 1972, and Sunoco Operations Inc. sold \$20 million, off \$5 million from 1972.

Petro-Lewis Funds Inc. sold \$18.2 million in oil-income programs and \$1.8 million in drilling programs, compared with \$17.6 million and \$6.2 million, respectively, in 1972.

McCulloch Oil Corp. - IDS Oil Programs Inc., which topped the \$20-million mark by \$4.4 million in 1972, fell to \$17.9 million in 1973.

All sales figures include company subscriptions to their own programs.

Total programs filed with the Securities & Exchange Commission amounted to \$896.7 million in 1973, off \$173.2 million from 1972.

East vs. West*—oil earnings, production

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Gross production (MM bbl)											
West	1,243	1,288	1,355	1,402	1,389	1,483	1,517	1,505	1,565	1,536	1,494
East	2,310	2,540	2,882	3,235	3,627	3,919	4,386	5,016	5,711	6,563	7,058
Net earnings (\$MM)											
West	588	590	647	619	670	785	843	849	825	1,002	769
East	1,227	1,429	1,245	1,353	1,490	1,451	1,782	1,818	1,917	2,236	1,995
Net worth on Jan. 1 (\$MM)											
West	5,078	5,027	5,075	5,529	5,672	5,923	5,542	5,795	5,966	6,274	7,210
East	9,353	10,115	11,232	12,027	12,929	13,542	14,245	15,446	16,249	17,370	19,882
Return on net worth (%)											
West	11.6	11.7	12.7	11.2	11.8	13.3	15.2	14.7	13.8	16.0	10.7
East	13.1	14.1	11.1	11.2	11.5	10.7	12.5	11.8	11.8	12.9	10.0
Earnings (¢/bbl)											
West	47.3	45.8	47.7	44.2	48.2	52.9	55.6	56.4	52.7	65.2	51.5
East	53.1	56.3	43.2	41.8	41.1	37.0	40.6	36.2	33.6	34.1	28.3

*Based on operations of British Petroleum Co., Exxon Corp., Gulf Oil Corp., Mobil Oil Corp., Royal Dutch/Shell Group, Standard Oil Co. of California, and Texaco Inc. in Eastern and Western Hemisphere, excluding U.S.

Bank sees new emphasis on western oil

North, South American petroleum offers most-immediate relief in energy crisis. Soaring wellhead prices, proximity of reserves to huge U.S. market signal shift of attention from Eastern Hemisphere supplies.

A NEW emphasis on Western Hemisphere oil supplies promises to cut back the shift toward the Eastern Hemisphere that was so marked in the 1960's.

The petroleum potential of North and South America is far from exhausted and offers most immediate means of narrowing hemisphere's energy gap, First National City Bank says in its January energy memo.

Exotic new energy sources—from garbage oil to solar power—are being urgently examined. But at best they represent slow-moving solutions to fast-moving problems, the bank says.

In recent years, the Western Hemisphere outside the U.S. has often been downplayed because of its relatively unfavorable oil reserves, ranging from some 10 years at the current production rate in Canada to under 12 years in Venezuela and the U.S.

A large part of the Western Hemisphere's production derives from sustained investment and technical input of the seven largest international oil companies—British Petroleum Co., Exxon Corp., Gulf Oil Corp., Mobil Oil Corp., Royal Dutch/Shell Group, Standard Oil Co. of California, and Texaco Inc.—the bank says.

Over the past 10 years, gross production of the seven companies in

the Western Hemisphere outside the U.S. has been rising at less than 2% annually, significantly slower than soaring world demand.

The bank's 10-year summary shows gross production of 1.494 billion bbl in 1972 (4.1 million b/d), a 5-year low. Gross production of the same companies in the Eastern Hemisphere in 1972 amounted to 7.058 billion bbl.

The bank says the time appears ripe to reverse the recent sluggishness of production in the Western Hemisphere with increased exploration. Unparalleled high wellhead prices mean production and pipeline investments can now be justified by discoveries much smaller than hitherto. Deepwater structures have a new glitter, the bank says.

Eastward shift. Although the outlook for increased Western Hemisphere oil exports is changing for the better, the U.S. has continued to shift toward sources in the Eastern Hemisphere.

At the beginning of the 1960's crude imports from the East were only about half as large as those from the West. In 1973, crude supplies from the East for the first time moved ahead of those from the West.

Although U.S. product imports from the West outstrip the East five to one,

product as well as crude imports from the Eastern Hemisphere have begun to rise rapidly in the 1970's. And nearly half the products from Western Hemisphere sources are manufactured from Eastern Hemisphere crudes, the bank estimates.

Western advantage. Western Hemisphere production has an obvious advantage in that it is nearer the North American market, which consumes more energy per head than any other region and represents some 35% of world demand, the bank says.

Caribbean terminals are less than 2,000 miles from the U.S. East Coast, against 12,000 miles from the Middle East. Higher freight rates have strengthened this advantage dramatically in recent years.

Tanker rates rose steeply in the first half of 1973, after a decline from the 1970 peak. The Arab embargo since has triggered a reduction, and inability to buy bunker fuel has further depressed the tanker market.

Profit recovery. Rates of return earned by the seven largest international oil companies in the Western Hemisphere in the early 1960's ranged between 11.2% and 12.7%, the bank says.

From 1967 to 1971, rates of return improved, ranging from 13.3% to

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16%. But profitability declined sharply in 1972 to 10.7% in the Western Hemisphere and 10% in the East. In 1972, oil company earnings in the West outside the U.S. were some 2% below those of manufacturing companies.

There were signs in 1973 that in spite of the sharp increase in tax-paid costs, profitability of petroleum operations moved up strongly in the West as well as the East. In Venezuela, where 1972 earnings were ex-

tremely disappointing, advances were achieved by major oil affiliates, the bank says.

The five largest affiliates earned a discouraging 11.1% return in Canada in 1972.

Comparing the first three quarters of 1973 to the similar period of 1972, these earnings rose by 35%.

"In 1974, oil-importing countries will have to bear the brunt of drastic deterioration in their terms of trade with exporting countries. But changes

of this magnitude inevitably set in motion their own corrective forces," the bank says.

Energy demand cutbacks and increased energy production in North America and in those nearby countries best able to supply it are essential, Citibank asserts.

For broadly based energy companies, the new emphasis on the West will provide opportunities for challenging new investments that have been too long deferred, the bank says.

Ban sought on joint lease bids by big firms

THE Government plans major changes in offshore-leasing procedures as it moves toward President Nixon's new goal of selling 10 million acres next year.

Interior Sec. Rogers C. B. Morton told Congress of plans "to ban bidding consortia among the largest oil producers."

Departmental technicians are still working on the formula to define "the largest oil producers."

But a spokesman said last week the rules will probably bar the top 6-10 companies, based on size of reserves, from joint bidding with each other.

"Since these companies are financially able to bid alone, elimination of joint bidding among them will increase the number of competitive bidders in the sale," Morton said. "Moreover, this ban may induce the largest oil companies to enter bidding consortia with smaller independent companies, giving the latter a better opportunity to secure shares in leases than they have at present."

The new regulations won't be ready in time for application to the next offshore sale, scheduled in March, and may not be incorporated until next year, Interior officials said.

Within a few weeks, Interior plans to publish a call for nominations of areas—not tracts—to be included in future sales as the Government tries to jump offerings to 10 million acres annually from the present 3 million acres.

The U.S. Geological Survey has identified 19 areas for prospective sales and will gauge the interest of industry and the public in them.

These will be ranked according to reserves potential and environmental

safety, enabling Interior to focus on four or five target areas to be auctioned first.

"Since it is important that the most promising offshore areas be developed first," Morton explained, "if the environmental conditions are acceptable, the accelerated leasing program will be coupled with a new two-tier nominating system. Under this system industry will first rank the regions they think are the most favorable."

The public will be invited to identify environmental conditions and problems in these regions.

"The Interior Department will use

the industry and environmental rankings of regions along with its own evaluation of reserves potential and need to protect environmental values, to select the most promising regions for early development."

Later, within designated sales areas, industry will nominate individual tracts as is being done at the present time.

"The two-tier system will help to ensure that our scarce oil exploration and development resources can be employed on the most promising tracts and that major areas of environmental concern will not be touched," Morton says.

Louisiana-to-Florida gas, product pipelines planned

FLORIDA Gas Transmission Co. will spend \$136.5 million to complete parallel natural-gas and products pipelines from Louisiana to Florida, if the Federal Power Commission approves the project.

The Florida Gas Co. subsidiary has asked FPC permission to convert 880 miles of its original 24-in. natural-gas pipeline to products.

The company would complete unfinished segments of its parallel 30-in. pipeline to maintain deliveries of gas to Florida.

The main line of the proposed products system from Baton Rouge, La., to Fort Lauderdale, Fla., will transport gasoline, jet fuel, kerosene, and heating oil. Initial capacity would exceed 200,000 b/d, about one half of Florida's current daily products con-

sumption.

The \$115-million system would begin operations in January 1977, delivering products to various Florida terminals. Nearly all products brought into Florida currently are transported by barge and tanker.

The gas system, which has a capacity of 690 MMcf/d, presently consists of the 24-in. line from Baton Rouge to Miami and a 30-in. loop which parallels and interconnects with about 95% of the smaller line.

Florida Gas estimates building the remaining segments of the 30-in. line and adding compressors would cost \$21.5 million. After conversion, capacity of the gas system would be about 630 MMcf/d, but additional volumes could be moved by adding compression.

U.S. BRIEFS

GOVERNMENT

DR. Thomas V. Falkie, 39, head of the department of mineral engineering at Penn State University, has been named by President Nixon to be director of the Bureau of Mines.

On Senate confirmation, he will succeed Dr. Elbert Osborn, who resigned in September. Dr. John D. Morgan, acting director, will resume his post as assistant director—mineral position analysis.

► **The Justice Department** has granted antitrust clearance to U.S. international companies for price and ownership negotiations with producing countries. Justice has given such clearance in other instances, agreeing not to prosecute companies because of joint negotiations. However, officials added, these business review letters, advising companies as to prosecution intentions, do not amount to immunity in the event of antitrust-law violations.

OFFSHORE

A NEW offshore drilling firm, K/S Norway Jackup, has ordered a Livingston-designed Class III jack-up rig from Livingston Shipbuilding Co., Orange, Tex.

Total price of the triangular-shaped, three-legged unit is estimated at more than \$18 million, including drilling equipment and machinery. Delivery is set for September 1976.

The new rig will measure 208 ft long, have a beam of 178 ft, and be 22 ft deep. The triangular platform will have a 50-by-50-ft stern drilling slot through which nine well positions can be drilled. The unit will be capable of drilling in water depths to 300 ft, and will have legs 418 ft long.

K/S Norway Jackup is made up of Fearnley & Eger Chartering Co. Ltd.; Skips A/S Kim; and Odfjell Drilling & Consulting Co. AVA/S

► **A major facility** for the fabrication of large metal structures and components will be built on the eastern shore of Virginia by Brown & Root Inc. The Chesapeake Bay facility will be used for construction of offshore production platforms; modular plant construction; offshore power-plant construction; and storage-tank fabrication.

Brown & Root purchased the 2,000-

acre Hollywood Farm property in, and adjacent to the town of Cape Charles; however, only a small part of it, 10-20%, will be used for manufacturing during the foreseeable future. The remainder will continue in farm production and as a golf course for some time.

► **Another large semisubmersible offshore rig** of Sedco Inc.'s 700-series design will be built by Avondale Shipyards for a joint venture of Sedco and a Shell subsidiary. The latest rig, estimated to cost \$35 million, is scheduled for delivery in May 1976. It will be rated initially for 1,500-ft water depths. But it could later be equipped with dynamic positioning for operation in even deeper water. Rated drilling depth is 25,000 ft. Sedco is expected to announce yet another construction commitment for a similar rig in the next few weeks.

► **Marathon Oil Co.** will succeed Signal Oil & Gas Co. as the operator for the SLAM and Slant groups offshore Louisiana in the Gulf of Mexico, effective Apr. 1, 1974.

EXPLORATION

TEXACO INC. has a 428-b/d oil discovery on a 7,520-acre farmout from Tenneco Oil Co. in California's San Joaquin Valley, 20 miles south of Bakersfield.

The well, 1 San Emidio, was drilled to 20,704 ft, but production was found between 11,305 ft and 11,465 ft. The 428-b/d flow was recorded on a 24-hr test through a 26/64-in. choke.

Texaco has released the Loffland Bros. rig on the well but said development of the field is planned for later this year. Texaco and Tenneco also hold jointly 5,610 acres adjacent to the farmout tract.

RESEARCH

THE Atomic Energy Commission has proposed that \$107.6 million be spent over the next 5 years to develop nuclear stimulation for both natural gas and oil shale.

Of this, \$56.2 million would be spent in stimulating nuclear recovery of natural gas from tight sands. This would include a demonstration field experiment of five to six wells with three to five explosions per well. The ex-

plosives in each well would be fired simultaneously, while those in separate wells would be separated by several minutes.

The remainder of the money—\$51.4 million—would be for nuclear blasts in oil shale at a Nevada test site. The test would investigate the quantity of noncondensable gas that could be generated by explosions in carbonate rock.

The program would include a pilot-scale nuclear chimney and underground retort, with the start of a demonstration-scale plant near the end of 5 years.

GEOHERMAL

UNION Oil Co. of California has drilled a potentially commercial geothermal well in Sandoval County, N.M. The well, which would be New Mexico's first commercial geothermal project, flowed geothermal fluid at rates with a power-capacity equivalent to 6,500 kw/hr from a total depth of 6,929 ft.

Union said the test-flow rates are equal to some of the better wells drilled in northern California's Geysers field, where Union operates the largest geothermal steam project in the world.

The New Mexico well, north of Albuquerque, is located on a 100,000-acre tract on the Baca Ranch in Sandoval and Rio Arriba counties. Further drilling is planned to define the productive area.

Union holds a majority interest in the project and is the operator. Other participants are Dunigan Enterprises Inc. and Baca Land & Cattle Co.

PROCESSING

KERR-McGEE Corp. has signed an agreement to purchase Southwestern Oil & Refining Co., Corpus Christi, and Royal Petroleum Corp., New York. Southwestern owns a 100,000-b/d refinery at Corpus. Royal owns terminal facilities in the New York-Perth Amboy, N.J., area. Purchase price is not disclosed.

► **Mld-States Pipe & Supply Co.**, Tulsa, has purchased and will dismantle Phillips Petroleum Co.'s Cactus ammonia plant near Etter, Tex. Some of the more modern units will be resold.

TABLE

Profits As A Percent Of Invested Capital
Twenty Largest U.S. Petroleum Firms

Firm (Ranked according to 1971 sales)	Average Profit Rate (1967-1972)	Profit Rate 12 Mos. Ending 9/30/72
1. Exxon	12.3	17.4
2. Mobil Oil	10.7	14.2
3. Texaco	13.8	15.4
4. Gulf Oil	10.4	12.1
5. Standard Oil of California	10.4	13.5
6. Standard Oil of Indiana	9.7	12.5
7. Shell Oil	10.6	11.4
8. Atlantic Richfield	8.4	6.9
9. Continental Oil	10.1	12.1
10. Tenneco	11.2	NA
11. Occidental Petroleum	14.2	NA
12. Phillips Petroleum	8.4	10.0
13. Union Oil of California	9.2	9.2
14. Sun Oil	9.5	9.4
15. Ashland Oil	11.6	NA
16. Standard Oil of Ohio	8.2	7.6
17. Getty Oil	8.5	8.0
18. Marathon Oil	11.4	13.5
19. Clark Oil	15.2	30.1
20. Commonwealth Oil Refining	11.5	9.8
Average	10.8	12.5
Average: All Manufacturing (1967-1971) ¹	10.8	

¹Economic Report of the President, January 1973, p. 280.

Source: Fortune, May issues and Business Week, Nov. 10, 1973, p. 27.

Worldwide oil at a glance

COUNTRY	RESERVES 1-1-74		WELLS		OIL PRODUCTION		REFINING Capacity (1,000 b/cd) 1-1-74			
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-73	Drilling 12-1-73	Estimated 1973 (1,000 b/d)	% change from 1972	Refin- eries	Crude	Cracking	Reform- ing
ASIA-PACIFIC										
Afghanistan	†89,840	4,100	13	4	0.2					
Australia	2,300,000	37,100	394	7	420.0	23.3	10	680.9	144.7	156.7
Bangladesh		8,000		1			1	30.6		1.6
Brunei-Malaysia	1,600,000	20,000	126	5	325.0	17.7	3	123.2		5.7
Burma	67,800	210	700	7	23.0	15.0	2	25.3		
China Rep. (Taiwan)	14,000	410	50	2	0.2		2	210.0	9.0	20.0
Guam							1	29.5		
India	779,000	2,000	1,500	9	150.0	- 0.5	10	499.1	36.1	21.8
Indonesia	10,500,000	15,000	2,567	25	1,300.0	22.6	8	427.7	19.5	7.0
Japan	19,000	700	1,084	11	15.0		45	4,939.8	277.4	486.0
Khmer Republic							1	12.5		1.8
Korea, South							3	420.0		27.6
New Zealand	†224,000	15,000	4	1	3.6	33.0	1	54.0		18.0
Okinawa (R.I.)							3	212.0		12.0
Pakistan	31,200	10,120	16	5	8.0	-11.1	3	80.5		2.5
Philippines		180		3			4	283.8	21.7	42.6
Singapore							4	699.6		20.0
Sri Lanka							1	38.0		3.5
Thailand	10,200		25	2	0.2		4	166.2	7.0	23.5
Total Asia-Pacific	15,635,040	114,200	6,479	82	2,245.2	20.0	106	8,932.7	515.4	850.3
†Condensate										
EUROPE										
Austria	157,000	589	1,250	5	50.0		1	220.0	16.5	24.0
Belgium							8	916.7	55.3	90.8
Cyprus							1	15.0		2.7
Denmark	248,500	1,800	4	1	3.1	-11.4	3	226.5	18.0	19.3
Finland							2	196.0	32.0	25.8
France	80,000	6,500	284	5	26.3	-12.6	23	3,140.0	182.4	389.6
Germany, West	544,000	12,308	2,782	6	133.0	- 3.4	33	2,825.7	126.1	332.9
Greece†							4	313.6		21.5
Ireland†							1	58.0		13.3
Italy-Sicily	212,000	5,300	125	7	22.3	3.7	34	3,882.0	304.7	374.6
Netherlands	251,000	92,000	319	9	28.6	- 8.6	7	1,825.5	75.0	163.9
Norway	4,000,000	23,000	4	6	37.5	13.6	3	168.0		18.5
Poland*							6	145.8	13.5	10.8
Portugal							2	110.0	12.0	15.6
Romania*							10	320.0		
Spain	60,000	500	26	4	22.2	788.0	9	1,163.0		138.5
Sweden							5	248.0		47.8
Switzerland							2	140.0		23.0
United Kingdom	10,000,000	50,000	63	18	1.5	-11.7	20	2,762.1	188.0	386.2
Yugoslavia	**438,000	1,800	1,012	8	71.0	9.7				
Total Europe	15,990,500	193,797	5,869	69	395.5	5.9	158	18,110.1	1,010.0	2,088.0
†Oil or gas discovered but not developed. *Not included in non-communist total. **Government estimate adjusted.										
MIDDLE EAST										
Abu Dhabi	21,500,000	12,500	142	4	1,285.5	22.5				
Bahrain	360,000	4,000	215		63.7	- 8.7	1	250.0	34.2	14.3
Dubai	2,500,000	1,000	39	2	223.0	45.8				
Iran	60,000,000	270,000	350	9	6,000.0	19.5	5	660.0	36.0	41.3
Iraq	31,500,000	22,000	133	9	1,888.2	30.5	6	98.5		5.0
Israel	2,500	25	29	1	†100.0	- 7.0	2	212.0		27.0
Jordan							1	14.1	2.3	1.0
Kuwait	64,000,000	32,500	692	1	2,890.2	- 3.6	5	646.0		20.4
Lebanon							2	53.5	7.2	7.3
Neutral Zone	17,500,000	8,000	362	1	507.5	-11.2		††		
Oman	5,250,000	2,000	97	2	271.9	- 3.5				
Qatar	6,500,000	8,000	92	3	555.5	15.2	1	1.0		
Saudi Arabia	132,000,000	50,900	627	3	7,417.9	29.4	2	428.3		15.1
Sharjah	1,500,000	1,500	*	2						
South Yemen (Aden)							1	162.0		8.6
Syria	7,100,000	700	123	1	105.7	-12.1	1	51.3		
Turkey	450,000	200	286	6	65.0		4	305.5	28.6	28.3
Total Middle East	350,162,500	413,325	3,187	44	21,374.1	18.1	31	2,882.2	108.3	168.3
†Includes captured Sinai fields. *Not yet producing. ††Included in Kuwaiti figures.										

REFINING capacity in non-Communist countries outside the U.S. and Canada will be just over 38 million b/d on Jan. 1, 1974, according to the Journal's detailed world-wide survey.

The 38.3-million-bbl total compares with 34.8 million b/d on Jan. 1, 1973, for a 10.1% growth. But, this rate of growth is expected to slow appreciably for the next year or so. The Journal projects a 38.9 million bbl capacity for Jan. 1, 1975, and 40.0 million b/d for Jan. 1, 1976.

Biggest increases in crude capacity the past year came in Western Europe, where a 1.3-million-b/d gain was chalked up. Close behind was the Asia-Pacific area, which accounted for a hike of 1.0 million b/d.

Recognizing the importance of catalytic cracking and catalytic reforming in the world's refineries, the Journal made a change this year in reporting on cracking and reforming operations. In previous years, the totals included both thermal and catalytic capacities. This year, only the catalytic operations are totaled.

Though catalytic-cracking operations have not been as important in other countries as they are in the U.S. and Canada, Western Europe shows 1.0 million b/d capacity. Latin America 636,000, and Asia-Pacific, 515,000 b/d. Catalytic reforming shows up more strongly in Western Europe, with 2.1 million b/d capacity, and in the Asia-Pacific area, with 850,000 b/d.

Hydroprocessing in Western Europe totals 5.1 million b/d, while that in the Asia-Pacific area amounts to 3.3 million b/d. Total Western bloc outside the U.S. and Canada shows 10.6 million b/d hydroprocessing capacity.

Over the next 2 years, hydroprocessing is expected to show the biggest gains in downstream processing throughout the non-Communist nations. Total capacity outside the U.S. and Canada is expected to hit 11.4 million b/d on Jan. 1, 1976.

Cat reforming should show about 500,000-b/d growth in the 2-year period, to 4.0 million b/d. Cat-cracking growth should be more modest, from 2.3 to 2.6 million b/d.

(Capacities in 1,000 b/d)

	1-1-73	1-1-74	Projected 1-1-75	1-1-76
Crude-oil capacities				
Asia-Pacific	7,916	8,933	9,100	9,300
Africa	825	1,092	1,200	1,400
Middle East	2,758	2,882	3,000	3,200
Latin America	6,451	7,266	7,300	7,500
Western Europe	16,826	18,110	18,300	18,600
Sub total	34,776	38,283	38,900	40,000
U.S. and Canada	14,812	15,171	15,100	17,000
Total, non-Communist	49,588	53,454	55,000	57,000

Catalytic cracking				
Asia-Pacific	475	515	525	550
Africa	50	60	61	63
Middle East	100	108	110	115
Latin America	575	636	645	655
Western Europe	1,000	1,010	1,100	1,200
Sub total	2,200	2,329	2,441	2,583
U.S. and Canada	4,850	4,940	4,999	5,017
Total, non-Communist	7,075	7,269	7,440	7,600

Catalytic reforming				
Asia-Pacific	765	850	900	950
Africa	116	139	145	150
Middle East	214	168	173	178
Latin America	351	329	335	345
Western Europe	2,042	2,088	2,200	2,400
Sub total	3,488	3,574	3,853	4,023
U.S. and Canada	3,459	3,568	3,647	3,793
Total, non-Communist	6,947	7,142	7,500	7,773

Hydroprocessing				
Asia-Pacific	2,788	3,309	3,500	3,700
Africa	126	259	270	280
Middle East	478	552	560	570
Latin America	1,220	1,377	1,390	1,410
Western Europe	4,557	5,067	5,200	5,300
Sub total	9,169	10,563	10,920	11,300
U.S. and Canada	6,229	6,897	7,100	7,300
Total, non-Communist	15,398	17,460	18,020	18,600

OPEC startled the world in mid-October when the oil ministers, sitting in Kuwait, unilaterally seized the initiative and boosted crude postings by 66-70%. In future, OPEC said, prices will no longer be subject to negotiation, but will be set by host governments.

That move spelled the end of cheap energy for good. The producers had discovered through observation and personal experience in their sales of participation crude, that market prices had moved up to and often above posted prices. This, they believed, meant the oil companies were reaping unconscionable profits in the market.

To correct the situation, the Arabs and Iranians declared that henceforth posted prices should remain at a constant 40% above market prices, but at year-end, they were still unable to

reach a method of determining just what a "market price" really is.

Thus rang the death knell for the so-called "5-year security" Tehran agreement of 1971—a major casualty of the oil war.

The year of Libya. Libya spent 1973 in a vigorous campaign to gain control of its oil industry, taking its cue from Iran.

Early in the year, the government served notice that it wanted not 25% participation in oil-company operations as the Gulf states had gained, but 50%.

In midyear, it began touting for 100% control, but this proved a smoke-screen, for the country is in no position technically to operate its vast oil fields.

In frustration, in mid-August, the

government announced that Occidental Petroleum had yielded to its demand for 51% control of its operations, and the die was cast. One by one, the independent dominoes fell before the government onslaught and gave in to the 51% control demand.

The major companies held out. But on Sept. 1, as a birthday gift to the Libyan revolution of 1969, Col. Qaddafi announced a unilateral takeover of 51% of all the major-company operations. The sole exception was Esso's gas liquefaction plant at Brega. At year-end, the majors continued their holdout, and the Libyans, distracted by the Arab-Israeli war and the cut-back-embargo operations, were not seriously pushing their case. But there's no doubt that 1974 will see the complete takeover established.

COUNTRY	RESERVES 1-1-74		WELLS		OIL PRODUCTION		REFINING			
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-73	Drilling 12-1-73	Estimated 1973 (1,000 b/d)	% change from 1972	Capacity (1,000 b/cd) 1-1-74			
							Refin- eries	Crude	Crack- ing	Reform- ing
AFRICA										
Algeria	*7,640,000	105,945	574	10	1,035.4	- 2.6	4	115.3		30.5
Angola-Cabinda	1,500,000	1,500	169	5	160.0	14.7	2	24.5		1.9
Congo Brazzaville	4,888,000	1,000	19	3	39.0	490.9				
Dahomey†										
Egypt	5,125,000	4,200	261	4	180.0	-15.0	4	180.0		
Ethiopia†							1	14.4		1.9
Gabon	1,500,000	6,500	122	4	145.0	15.4	1	17.0		2.0
Ghana†							1	25.3		9.4
Ivory Coast							1	44.2		5.0
Kenya							1	48.0		4.0
Liberia							1	10.0		2.0
Libya	25,500,000	27,000	895	9	2,116.6	- 4.5	5	16.4		1.5
Malagasay							1	1.5		0.3
Morocco	750	25	22	2	0.9	4.2	2	58.5	3.6	7.6
Mozambique†							1	17.0		2.5
Nigeria	20,000,000	40,000	898	28	2,000.0	10.0	1	60.0		6.0
Rhodesia							1	(not operating--not included in total)		
Senegal							1	18.0		2.0
Sierra Leone							1	10.0		
Sudan							1	22.0		2.0
Tanzania							1	17.0		2.6
Tunisia	950,000	1,500	56	4	87.0	4.6	1	21.4		3.0
Union of South Africa†							5	331.0	55.9	46.1
Zaire††	200,000	50					1	16.1		2.7
Zambia							1	24.6		5.6
Total Africa	67,303,750	187,720	3,016	69	5,763.9	1.8	39	1,092.2	59.5	138.6

*Revised. †Oil or gas discovered but not developed. ††To go on production at 25,000 b/d in 1975.

WESTERN HEMISPHERE										
Antigua							1	17.3		1.9
Argentina	2,500,000	8,000	4,096	30	442.0	2.0	14	623.6	101.2	51.4
Bahamas							1	500.0		
Barbados†	250						1	3.0		
Bolivia	260,000	10,000	253	4	47.0	7.8	5	25.5		
Brazil	799,000	921	1,265	25	170.0	3.0	10	791.8	168.6	20.8
Chile	124,000	3,400	466	6	30.0	-12.8	3	123.5	26.3	10.0
Colombia	1,432,000	2,500	2,023	8	186.0	- 5.8	6	166.1	49.5	2.0
Costa Rica†							1	7.6		1.1
Cuba							3	122.0	14.6	11.7
Dominican Republic†							2	46.0		7.0
Ecuador	5,675,000	5,000	829	6	197.0	148.1	3	35.2		
El Salvador							1	13.7		2.1
Guatemala†							2	26.0		6.0
Honduras							1	14.0		1.8
Jamaica							1	33.0		2.3
Martinique							1	14.0		2.5
Mexico	3,600,000	11,000	4,345	45	478.0	8.4	6	625.0	109.0	56.3
Netherlands Antilles							2	945.0	35.0	15.0
Nicaragua							1	13.2		2.6
Panama							1	75.0		7.5
Paraguay							1	5.0		
Peru	1,050,000	3,500	2,499	13	68.0	1.8	5	106.8	6.7	1.8
Puerto Rico							3	307.8	47.8	75.5
Trinidad & Tobago	2,200,000	5,000	2,932	15	159.0	12.4	3	461.0	26.5	27.0
Uruguay							1	43.0	4.0	3.0
Venezuela	14,000,000	42,000	12,461	20	3,370.0	4.7	12	1,531.6	46.6	9.8
Virgin Islands							1	590.0		
United States	*34,700,249	247,310	503,505	1,411	9,225.0	- 2.4	247	13,383.0	4,512.5	3,273.1
Canada	9,424,170	**50,299	22,996	171	1,750.0	14.0	41	1,788.1	427.6	250.0
Total W. Hemisphere	75,764,669	388,930	557,670	1,754	16,122.0	2.0	380	22,436.8	5,575.9	3,897.2

†Oil or gas discovered but not developed. **Does not include Arctic gas. *Includes Alaska 10 billion.

Total Non-Communist	524,856,459	1,297,972	576,221	2,018	45,900.7	9.8	714	53,454.0	7,269.1	7,142.4
Communist World	*103,000,000	†735,400			9,312.0	4.5				
Total World	627,856,459	2,033,372			55,212.7	8.8				

*Including Russia with 80 billion, Red China 20 billion, and others 3 billion.

†Including Russia 706 trillion, Red China 20 trillion, Hungary 3 trillion, and others 6.4 trillion.

061

The year of Iraq. Iraq, following its June, 1972 nationalization of Iraq Petroleum Co.'s northern oil fields, reached a surprisingly quick settlement with the company in late February.

Under its terms, IPC yielded title to all the northern fields, agreed to pay \$350 million in back claims, and gained 15 million tons of Kirkuk crude entitlement as compensation. It further affirmed Basrah Petroleum's title to fields in southern Iraq and committed Basrah, an affiliate of IPC, to a vigorous expansion program.

But Basrah was not spared. With the outbreak of the Arab-Israeli war on Oct. 6, the Iraqi government slapped a nationalization decree on the American holdings in the company—Near East Development Co. (50-50 Mobil and Exxon) held a 23.75% interest in Basrah.

Then, as the war rolled on, and Holland was classed an "unfriendly country" in the Arab oil war against the west, Iraq made a further seizure by nationalizing the Dutch share of the Royal Dutch/Shell group's interest in Basrah.

The group's 23.75% interest was held 60% by Dutch interests and 40% by British interests. Thus at year-end, Iraq held all its northern fields and 38% of Basrah, in the south.

Throughout the war and the cut-back-embargo campaign, Iraq has been quite vocal in its demand for nationalization of all western producing interests in Arab countries. It shunned the cutbacks as useless and went all-out to market as much crude as it could on world markets (except, of course, the U.S. and other embargoed countries).

The year of Saudi Arabia. Kingpin

of the war and of the oil weapon throughout the year was Saudi King Faisal. Not many months ago, he decried the mixing of politics and oil, but 1973 saw him reverse his stand and take the reins of leadership in the Arab world.

Faisal had given ample warning to the U.S. to change its policy toward Israel and the Middle East, or suffer the consequences. But Washington didn't respond to his overtures.

In mid-year, Pres. Sadat of Egypt gained the king's ear, and together the two leaders laid plans to achieve their goals.

Sadat would provide the political savvy, and Faisal the money.

Sadat also was eager to cast off the contentious Col. Qaddafi of Libya, who pursued his campaign to merge with Libya. Qaddafi killed his own plan by a disgraceful visit to Cairo in which he alienated the Egyptian people. Then he staged an actual "march on Cairo" with thousands of Libyan peasants trudging and driving down the principal highway eastward.

This was too much for Sadat. Hence his flight into the arms of Faisal, who conditioned his support for Sadat on Qaddafi's demise from the picture. And this is what did happen. In early December, Qaddafi closed his Cairo embassy and the Libyan-Egyptian marriage ended in divorce before it started.

A year for Algeria. In the early part of the year, Algeria racked up some new gains it had long sought. New 51-49% joint exploration agreements were signed with Sun Oil Co., Spain's Hispanoil, and France's Cie. Francaise des Petroles. Thus the state oil company, Sonatrach, gained some potent partners in its search for new oil and

gas reserves.

But Algeria had other surprises for the industry. In late September, Sonatrach announced to the world that it would pursue its own pricing pattern, and make some changes in the rules for buying its high-gravity, low-sulfur crude.

In all candor, the company confessed it had oversold itself in crude-sales contracts, and was making a 7% cut in 1973 deliveries and at least a 20% cut in 1974 and 1975—possibly 25%.

Sonatrach also sprang a new approach to oil-finding on the industry. Boiled down, it reads "if you want to buy our oil, you must help us find more."

Each crude-buyer, under the new plan, will be asked to "contribute" to exploration programs in Algeria. Buyers may choose between "active" and "passive" participation in the program.

The "active" participant may set up a joint-venture with Sonatrach on the usual 49-51% pattern and spend 35¢/bbl of lifted oil on exploration.

A "passive" participant can simply contribute 20¢/bbl of lifted oil to the Sonatrach exploration programs.

Thus did Sonatrach show its heels to other producing countries in a progressive new path to renewed exploration in the desert country.

Light ahead? Oilmen look to 1974 with mixed emotions. Some have hopes that OPEC will pursue a sensible course in its new-found muscular approach to the consuming countries and the international oil companies. Others fear even more turmoil in the year ahead.

In any case, nobody will ever forget 1973. That, indeed, was the year that was!

Worldwide refining

WORLDWIDE REFINING	Company and refinery location	Crude	Catalytic cracking	Catalytic reforming	Hydro- processing	Other processing
ALGERIA	SONATRACH:					
	Arzew	54,600		16,000	1,000 DHT	10,300 V, 1,500 L, 1,300 A
	El Borma	600				
	Hassi Messaoud	3,135				
	Maison Carree	57,000		14,500		
	Total	115,335		30,500	1,000	
ANGOLA	Cabinda Gulf, Cabinda	2,550				
	Companhia de Petróleos de Angola (SARL), Luanda	21,700		1,900	3,800 DHT 2,800 DHD	1,900 V, 11,300 Vis, 950 A
	Total	24,500		1,900	6,600	

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Refining capacity registers largest "nickel and dime" jump in history

LEO R. AALUND
Refining Editor

THE striking gain in U.S. refining capacity last year rates as one of the biggest statistical surprises in the history of the industry.

Announced projects at the beginning of 1973 indicated a bleak increase of only some 160,000 b/d, or growth in the range of 1%.

What really happened is that capacity, as reported to The Oil and Gas Journal, shot up some 830,000 b/d—a jump of over 6% (Table 1). This is the biggest volume gain in recent memory and except for the 6.6% hike in 1967 the largest percentage increase in at least a decade.

In hindsight, the jump is not a total surprise, though the suddenness of it borders on a crash program. It illustrates what a mixture of government policy and profitability can produce.

Refiners have repeatedly said that given proper incentives and firm government policy that they could get moving. The first break in the logjam came last spring when crude-oil import regulations were revamped. As a result, a refiner could get all the oil he could chase down. There was also a rosy future of burgeoning world oil production, particularly in Saudi Arabia.

At the same time product prices firmed and moved up. Many refiners who hung on by their nails in 1971 and 1972 found they could compete in the improved climate.

Good product prices also made it possible to spend more on incremental expansions in large refineries. This accounted for most of last year's increase which has been called the big-

Crude capacity shows big gain

Table 1

	Capacity		Est. % change by 1-1-75	Construction	
	1-1-74	% change from 1-1-73		1974 completions*	1975 completions*
Crude, b/cd	14,216,287	+ 6.2	+3.0	425,000	725,000
Crude, b/sd	14,876,050	+ 6.3	+3.0	447,000	763,000
Feed, b/sd					
Thermal operations	1,491,950	+ 3.5	+0.8	12,000	27,000
Cat reforming	3,358,038	+ 2.6	+3.2	108,500	185,000
Cat cracking†	4,618,580	+ 2.4	+1.0	46,000	58,000
Cat hydrocracking	855,840	- 1.0			6,500
Other hydroprocessing	5,780,110	+10.6	+6.7	386,000	897,000
Products, b/sd					
Alkylation	849,080	+ 4.6	+3.6	31,000	
Aromatics and isomerization	348,010	+ 4.3	+9.8	34,000	
Lubes	237,118	+ 6.9			
Coke, ton/day	43,410	+ 1.6			
Asphalt	683,601	+ 6.1	+1.7	12,000	17,000

*Known as of Mar. 1, 1974

†Fresh feed

Smaller refiners have relatively larger capacity gain

Table 2

	Companies with more than 200,000 b/d		Companies with less than 200,000 b/d	
	1-1-74	1-1-73	1-1-74	1-1-73
(Thousands of bbl)				
No. companies	17	16	115	115
No. refineries	110	109	136	136
Capacity, b/cd	11,324.3	10,736.9	2,892.0	2,646.1
Capacity, b/sd	11,888.7	11,227.9	2,987.3	2,763.7
Annual change % (b/cd)	5.5	3.4	9.3	2.3
% of U.S. total b/cd	79.6	80.2	20.4	19.8
Cat cracking (F.F.), b/sd	3,892.5	3,772.5	724.1	739.5
% of crude	34.4	33.6	24.0	26.7
Cat reforming, b/sd	2,723.2	2,716.7	634.8	557.2
% of crude	23.0	24.2	21.2	20.1
Hydrocracking, b/sd	779.4	785.0	76.5	80.0
% of crude	6.6	7.0	2.6	2.9
Other hydroprocessing, b/sd	4,877.4	4,456.5	92.7	77.2
% of crude	41.0	39.7	30.2	27.9
Alkylation, b/sd	734.2	658.8	114.9	153.2
% of crude	6.2	5.8	3.8	5.5

FCC capacity shows healthy gain*

Table 3

Type unit	Capacity 1-1-72	% recycle	Capacity 1-1-73	% recycle	Capacity 1-1-74	% recycle	Capacity 1-1-75 (est.)
FCC	3,985.3	21.7	4,034.0	18.9	4,242.3	18.6	4,292.0
TCC	490.0	19.7	384.6	16.8	312.8	20.3	312.8
Houdrflow	97.5	25.8	93.5	21.7	63.5	14.8	63.5

*Capacity in thousand's b/sd

Bimetallics capture more cat-reforming capacity

Table 4

Type reformer	Catalyst	Capacity* 1-1-72	% of total capacity	Capacity* 1-1-73	% of total capacity	Capacity* 1-1-74	% of total capacity
Semiregenerative	Conventional	1,421.0	44.8	1,349.8	41.2	1,180.6	32.5
Cyclic	Conventional	743.4	23.4	739.9	22.7	833.0	24.8
Semiregenerative	Bimetallic	874.8	27.6	967.0	29.5	1,172.7	35.0
Cyclic	Bimetallic			122.1	3.8	73.1	2.2
Other	Bimetallic	49.0	1.6	52.0	1.5	95.0	2.8
Other	Conventional	80.8	2.6	43.0	1.3	3.6	<1

*Capacity in thousand's b/sd

furic acid. The remainder is burned.

With our sixfold increase in sulfur, essentially all must be recovered to comply with environmental regulations. For recovery, a central amine (MEA) system is provided. Scrubbers are located throughout the refinery. The rich amine is returned to the central regeneration system where it is combined and stripped of H_2S . The following streams are scrubbed:

- Fuel gas.
- Ultracracker ethane and propane.
- Distillate Ultrafiner offgas.
- Coker propane and butane.
- Fluid cat cracker propane-propylene.

After recovery, the H_2S is converted to elemental sulfur in a conventional two-train Claus sulfur-recovery unit. Each train consists of three stages, and is designed for 200 long tons/stream day recovery. The normal sulfur recovery will be about 300 long tons/day. The two, 200-long ton/day trains are provided so that even when one train is down, there will be no significant sulfur emissions to the atmosphere. Operating adjustments will be made to bring the load quickly down to 200 long ton/day when one train is down.

Disposal of sour water will be to a disposal well, which is the present refinery practice. To provide future flexibility, in case well disposal becomes unacceptable, the sulfur-plant design provides for future addition of sour-water strippers.

Hydrogen supply. Both before and after the change in crudes, the refinery operation produces (in the Ultraformers) and uses (in the Ultracracker) large amounts of hydrogen. At present the production and use are roughly in balance, and no external source of hydrogen is needed.

After the switch, however, this will not be the case. Usage will increase for desulfurization of kerosine and diesel fuel in the distillate Ultrafiner, and production will drop because of the change in feedstocks to the Ultraformers.

We are always a little squeamish about the accuracy of relatively small numbers derived as the difference between much larger numbers.

Thus, we felt a certain lack of enthusiasm for the original design capacity number for the hydrogen plant to supply the future deficit. Another facet of the hydrogen plant also

bothered us a little — energy consumption. We had decided we should use natural gas for feed and fuel, but were not happy with the BTU loss involved.

Fortunately, an alternative was available which pleased us more. Hydrogen-rich offgases were found to be available from Amoco Chemicals Co. processing units in Texas City and nearby Chocolate Bayou. Our present plans are to purify these streams to supply the needed hydrogen — at a considerable overall saving in energy. Also, since several chemical plants will supply the hydrogen, we will not have all our hydrogen eggs in a single hydrogen-plant basket.

Utilities. The program will require some additional steam. A new 555,000-lb/hr boiler will provide steam at 850 psi to fit the existing steam-power generating cycle. Additional power will be purchased. Assignment of processing units to purchased power or to refinery power must be made.

In general, the more-critical units will be placed on refinery-produced power. This will involve a considerable rearrangement of the power-distribution system.

The new boiler, the larger new furnaces, and three existing boilers will be equipped to burn oil. At present the refinery is entirely gas fired, but these changes will make it possible to implement the crude-replacement program without importing additional natural gas.

Environmental. Currently, coke drums are steamed to a blowdown system. To reduce air pollution, a system will be provided to oil-scrub the vapors from both old and new coke drums.

Measures are included to protect the quality of the effluent water. These include a more-extensive system for collecting sour waters to avoid spilling these streams, unit separators on the new units, and maximum use of air cooling.

Integration. Major changes to an existing refinery, such as required for this program, are more complex and difficult to coordinate, and to execute than a clean new refinery project. Not only must the new facilities be installed efficiently, but there must be minimum interference with existing operations.

Obviously these two goals occasionally conflict. Schedules must not only accommodate equipment and materi-

al deliveries (difficult in itself these days), but tie-ins to existing units and systems must be consistent with the regularly scheduled maintenance turnarounds.

Considering these complexities, Amoco management set up a slightly different organization than it normally uses. A three-man team (the authors of this article) was appointed to handle all facets of the program. Fundamental assignments are shown in Table 2.

Our primary tool for proceeding with work in the early stages was an arrow diagram showing each of the detailed tasks to be done, a time for completion, and responsibility assignment to one of the three of us in line with the general assignments in the following Table 2.

Table 2

Texas City refinery-revamp team

C. W. Peters

Planning
Process studies
Economic studies
Coordination with research, marketing, and other head-office departments

J. A. Bauer

All liaison with refinery
Optimum integration of new and old facilities
Ecology matters
Recruitment and training of new staff
Control of refinery expense

E. P. Wells

Process design
Estimating
Project engineering
Procurement
Construction
Schedule responsibility
Cost responsibility

We met together at least every week, at first, for proper coordination. When major management decisions were required, we met with the vice-president of refining transportation and engineering, the manager of refining, and the manager of engineering for prompt answers and guidance.

All phases of the project have now been contracted and meetings of our threesome (or troika, as we have called it) are less frequent, as are our meetings with top management.

Progress is as good as the present environment permits, and our somewhat foggy crystal ball predicts completion in about mid-1976.

END

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gest nickel and dime expansion in history.

Talk of a big increase in capacity in early 1974 does have Alice-in-Wonderland overtones. The crude-oil embargo has idled much capacity in the U.S. refining industry.

Comparable? There is no doubt that the refining industry does today have much more capacity than expected. But the question is: Can we compare this 830,000-b/cd increase to that added in previous years on a barrel-for-barrel basis? Certainly, much of that expansion does not have the quality of that from, say, five 150,000-b/d new grass-roots refineries.

Also, a slight statistical aberration may have been introduced last year. American Petroleum Institute last year introduced some precise guidelines for counting capacity. For one thing, operable capacity was any capable of being put on stream within 30 days. The Journal adopted a modified version of these definitions.

No doubt many refiners have included this type capacity in the past, but last year all the 200 plus U.S. refiners were using the same rules.

Where it came from. An analysis of where the increase came from shows relatively less originated from refiners controlling more than 200,000 b/cd of capacity. Smaller refiners contributed more on a percentage basis (Table 2).

The top 16 companies in Table 2 were responsible for adding 481,000 b/cd of the 830,000-b/d increase. American Petrofina's contribution is not included in the preceding major refiner increase since it joined the 200,000-b/d club for the first time this year (it got in by purchasing BP's Port Arthur, Tex., refinery and reactivating a sizable portion of the capacity there).

Reactivations played a solid role in the 1973 expansion. Marathon put 75,000 b/d of mothballed capacity back on line at Robinson, Ill., and made additional increases there. At least 125,000 b/d of shutdown capacity was put back on line by refiners in 1973.

Also, last spring Exxon said it would make incremental expansions at several refineries totalling 100,000 b/d. The company apparently got this on line in 1973. This, along with 160,000 b/d of earlier known expansions plus reactivations, accounted for 43% of the increase.

Following are some of the highlights

Tulsa's newest hotel



Welcome to the Fairmont, Tulsa's newest hotel. New in every way you would want a new hotel to be. New in the way Mobil Tour Guide would expect a new hotel to be to receive a four-star rating. And the Fairmont is the only hotel in Oklahoma to receive an esteemed four-star rating, of course. But the Fairmont has been a landmark in Tulsa for years, of course. One of the most elegant next trip to Tulsa is the newest and brightest suites. One of the most elegant New, beautifully designed suites. Service you get only at a genuine four-star restaurants in the Southwest. Service you get only at a genuine four-star The Fairmont. The newest hotel in Tulsa.

Processing profile of refiners with over 200,000 b/cd capacity

Company	No. refineries	Crude capacity		Cat cracking		Cat reforming, b/sd	Hydro-cracking, b/sd	Other hydro-processing, b/sd	Alkylation, b/sd
		b/cd	b/sd	Feed, b/sd	Recycle,* b/sd				
1. Exxon	5	1,252,000	1,307,000	466,000	118,000	268,000	67,900	691,400	82,500
2. Shell	8	1,109,000	1,164,000	379,500	112,000	288,200	105,500	711,500	65,500
3. Texaco	12	1,083,000	N.R.†	442,270	132,591	232,780	38,890	352,800	59,970
4. Amoco	10	1,065,000	1,121,060	398,500	122,000	237,900	38,000	387,200	68,300
5. Standard (Calif.)	12	984,000	1,035,205	227,100	55,900	245,400	175,500	248,000	40,730
6. Mobil	8	932,000	972,800	327,700	68,100	178,400	47,000	448,600	67,000
7. Gulf	8	860,500	884,700	323,800	47,200	228,300	40,400	395,500	90,800
8. ARCO	6	789,800	846,550	174,000	15,000	249,000	89,200	432,000	22,200
9. Union Oil	4	487,000	508,100	133,700	19,000	122,000	51,000	245,400	24,800
10. Sun Oil	5	484,000	510,000	200,000	35,900	147,800	26,000	141,300	36,600
11. Phillips	6	403,700	N.R.†	173,800	53,800	111,600	22,000	155,800	58,500
12. Sohio/BP	4	384,250	406,300	127,900	31,000	119,700	56,000	137,500	21,000
13. Ashland	7	358,200	383,500	125,000	20,800	58,000	.....	155,000	18,000
14. Continental	7	349,200	360,500	111,100	28,880	79,300	.....	130,800	18,100
15. Marathon	3	314,000	332,000	86,500	16,400	71,300	22,000	57,100	12,650
16. Cities	1	268,000	282,100	125,000	20,000	46,000	.....	96,000	35,300
17. American Petrofina	4	200,000	210,210	70,600	5,700	39,500	.....	91,500	12,500
Total	110	11,324,350	11,888,726	3,892,500	902,271	2,723,180	779,390	4,877,400	734,150

*Calculated in some cases as 30% of fresh feed. †Calculated.

of the downstream scene:

Cat cracking. Catalytic cracking picked up its growth last year after a lag in 1972. However, total growth was held back by the retirement of units using older technology (Table 3).

Cat reforming. The exceptional growth of cat reforming continued to slacken off during 1973, growing only 2.6% between 1/1/73 and 1/1/74. This compares to a growth rate of over 6% during the previous 5 years. That was the period when U.S. refiners put much of their energy and financial muscle into units to make no-lead gasoline.

Ironically, barring literally an act of Congress or some higher authority, this country enters the no-lead gasoline era in just over 90 days—a time when it may be difficult to find any kind of gasoline.

But the trend to bimetallic catalysts continues strong. By the end of 1973, 40% of all cat-reforming capacity in this country used bimetallic catalysts compared with 30% at the beginning of 1972 (Table 4).

Inspection of the results also shows that continuous reforming, which makes up the majority of the "other" category in the table, is getting a good toehold in refineries.

Hydroprocessing. With the exception of hydrocracking, which declined, hydrotreating and hydrorefining processes chalked up the biggest gain of any downstream processes. Capacity used for hydrogen processing of mid-distillates stocks zoomed up 25% (Table 5).

Hydrotreating and hydrorefining surges

Table 5

Type feed	1-1-73, b/sd	1-1-74, b/sd	1-1-75 (est.), b/sd
1. Cat-reformer feeds	2,947,310	3,153,730	3,296,730
2. Middistillate stocks	1,230,500	1,542,360	1,735,160
3. Cat-cracking feed and recycle	276,200	339,690	350,000
4. Other	782,178	744,330	782,000

The large increases in hydrotreating and hydrorefining are a sign of the times. A large portion of the U.S. refining industry does not have the capability to process high-sulfur crude oil.

Many refiners must now develop the flexibility to process any of the world crudes they will have to import, many of which will be high in sulfur content.

Late last year, over \$530 million had already been dedicated for revamps to allow refiners to process sour crudes. Paradoxically, these costly projects will add little to U.S. refining capacity.

The big expansions by the majors that are due to start going on stream late next year and thereafter will be equipped to process sour crude. Hydrodesulfurization of vacuum gas oil and residuum will lead the processing wave for that round of activity.

Alkylation. Hydrofluoric and sulfuric acid alkylation displayed good growth last year, moving up 4.6%. HF alkylation carved out a bit larger slice of the alkylation pie and is expected to increase its share this year (Table 6).

Alkylation

Table 6

	HF, b/sd	H ₂ SO ₄ , b/sd	Total, b/sd
1-1-72	267,095	554,774	821,869
1-1-73	276,345	535,700	812,045
1-1-74	310,410	538,670	849,080
1-1-75*	330,410	549,670	880,080

*Est.

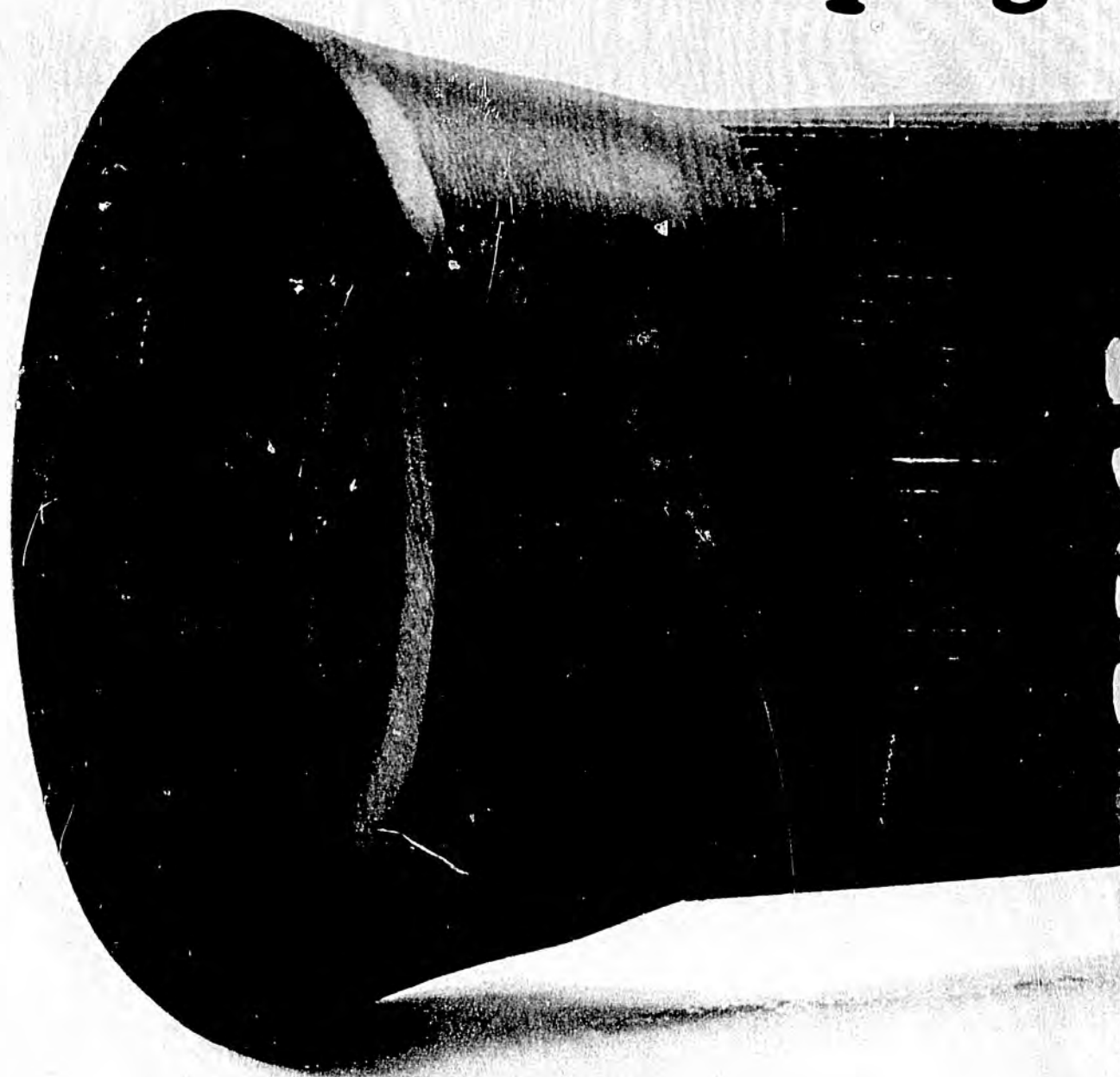
The future. This year, some 400,000 b/d of capacity is due to be added to the U.S. refining establishment. If the oil embargo is lifted, if the U.S. continues its energy belt-tightening, and if the rising cost of energy dampens demand, this may well be enough to get the country by.

A healthy batch of capacity is due on line in 1975. Most of that will be late in the year and come from Standard Oil Co. of California's huge expansion program. Given the proper climate, a half-dozen or so fuels refineries could be started this year and be on line by late 1976.

Whether this happens or not, the refining capacity now on blueprints around the country represents a staggering total.

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Oil scene may be brighter than first expected

OPTIMISM is growing among oil economists that Americans will escape a disastrous shortage of heating oil this winter despite an embargo on petroleum imports from Arab oil producing areas.

They now have, in fact, begun to express concern over the outlook for gasoline this spring and summer. And here the industry faces a dilemma.

There still is much winter weather ahead which requires continued refinery emphasis on producing heating oils, middle distillates and residual at least through February and perhaps

into March. But just as soon as possible, refiners need to switch yield patterns to produce more motor fuels to replenish dwindling gasoline stocks and meet rising demand for transportation fuels.

The problem? If refiners switch too soon, heating-oil supplies could get squeezed by prolonged winter weather. If the switch is made too late, the nation will be in serious trouble on gasoline all summer.

The industry normally makes these delicate decisions by individual action of each refiner reacting quickly to trends in the market. But this year, the Federal Energy Office is calling many of the shots on refinery runs and yield patterns. The Government's ability accurately to gauge market trends and fine tune refinery operations quickly is untested and, of course, plagued by uncertainties on the volume of imports.

Role of prices. But the big news is the belief flatly expressed by several oil econs that "we are past the critical danger point on heating oils this winter."

This is a real turn-about from the atmosphere of gloom and doom that prevailed in mid-November and early December when predictions of fuel runouts, closed factories, massive unemployment, and a depression were

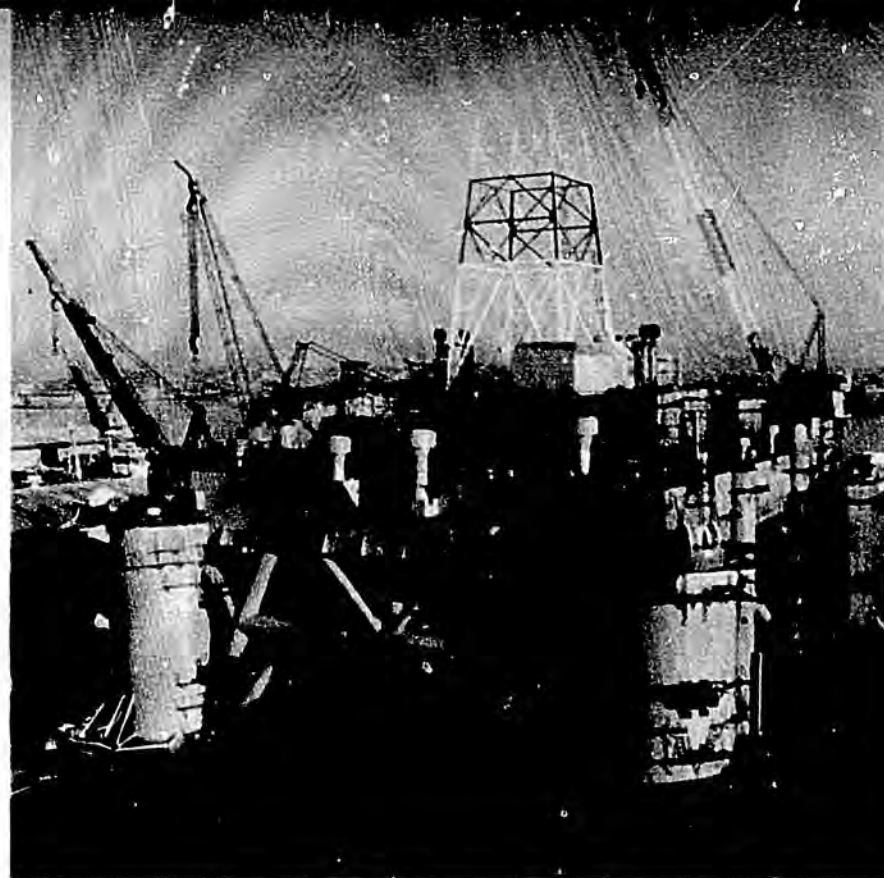
openly talked. Several things have happened since to brighten this picture. The import embargo hasn't proved as tight as expected, and imports of crude and products have remained higher than predicted. Refineries have managed to keep operations high. And consumers have slackened demand for gasoline and heating oils, thanks to conservation efforts and unusually warm weather early in the winter.

A few analysts attribute the improved supply-demand outlook to the fact that federal energy executives wisely have permitted the price mechanism to work.

"Imports are still coming in," one economist told The Oil and Gas Journal, "because we have allowed the price increases imposed by OPEC nations to flow through to the American consumer."

"The Arab countries and others who follow their price lead seem willing to let us have enough oil to get by if the price is right and we don't embarrass them. Caribbean refiners have been able to get the crude and process it into products knowing that we were willing to pay their price and let the costs flow through."

The Arab relaxation of planned production cutbacks and crude-price escalations led another analyst to observe that "the Arab embargo was related



FIRST semisubmersible drilling rig to be built on the U.S. East Coast is being completed at Bethlehem Steel's shipyard near Baltimore. The rig was built for Ocean Drilling & Exploration Co., New Orleans, and will drill in the Gulf of Mexico for Pennzoil Co.



A PIPE DREAM is what drillers would call this 267 miles of 24-in.-diameter pipe if it were casing which is so short it has hampered drilling recently. But it's line pipe destined for Ashland Oil's crude line from Owensboro to Catlettsburg, Ky.

more to economics than politics."

Some economists believe the prospects are good that total imports will continue strong probably in the 5-million-b/d range through the first half of 1974 and even increase appreciably if the Middle East political climate improves.

The result will be that price will be a restricting factor on demand and will encourage conservation and a switch to other fuels. "The experiences this winter," one economist observed, "proves the elasticity of energy demand, that price is an important supply-demand factor."

The shortfall. Economists agree on one point: their inability to make an accurate supply-demand forecast for

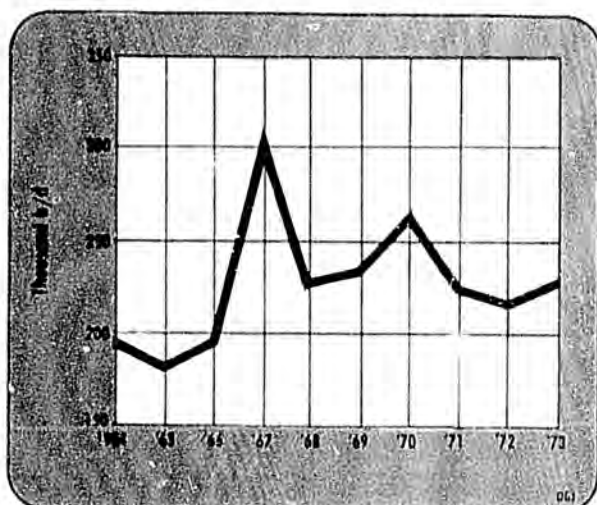
1974. The unknown variables just are too numerous.

Original estimates of the world crude shortage—7.5 million b/d in the first quarter of 1974—were changed when Libya joined Iraq in declining to enforce the embargo and when the Arab states eased their production restraints in late December. This prompted analysts to estimate the world shortage instead at 4 million b/d and to change the estimated U.S. shortfall from 3 million b/d to 1.5 million b/d. With heavier than normal stock withdrawals, the U.S. shortage thus could be cut to about 1 million b/d in the first quarter, a cut of about 5% in expected demand. On this basis, the shortage has manageable proportions.

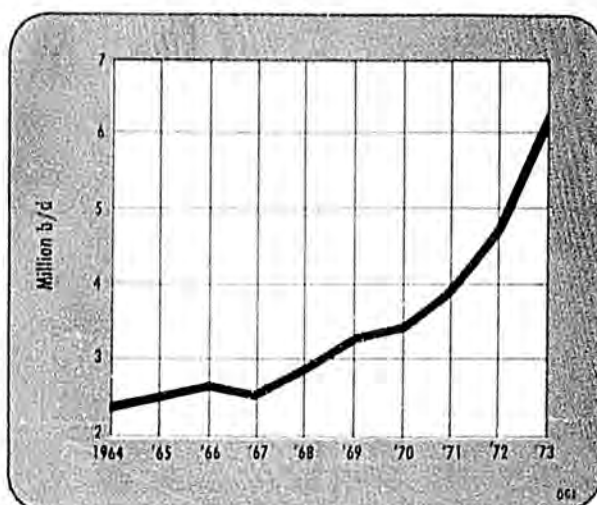
Because of better than expected imports and energy savings by consumers, gasoline rationing could be delayed until summer. There is a danger, however, that the improved prospects could prompt Americans to relax their attitude toward saving energy.

Oil supply will continue to be a serious problem. Even before the Arab oil embargo was imposed in mid-October, the U.S. petroleum supply-demand outlook was touch and go for this winter and next summer. As long as the embargo persists and for a considerable time after, one economist warned, U.S. consumption of petroleum will be limited by supply. The only short-term options are to increase

Exports turn up



Total imports increase



How embargo upsets supply-demand balance

	(1,000 b/d)			
	1973 Preliminary	1974 Predicted pre-embargo	1974 Demand limited by supply	Comments
Supply				
Domestic production				
Crude	9,203	9,032	9,200	Range is 9 MMb/d to 9.4 MMb/d. Some economists consider 1.7 MMb/d more realistic.
Gas liquids	1,735	1,725	1,775	
Total	10,938	10,757	10,975	
Imports				
Crude	3,212	3,937	2,500	Imports big question. Crude imports could dip to 2.3 MMb/d and products to 2.4 MMb/d.
Residual	1,849	2,167	1,600	
Other products	1,074	1,331	960	
Total	6,135	7,435	5,060	
Other supply	348	523	400	Processing gains.
Total supply	17,421	18,715	16,435	
Stock change	+ 114	- 28	???	Stock draw will augment supply.
Demand				
Gasoline	6,610	7,035	5,630	Assumes 13,475 Mb/d input at refineries; yields of 41% gasoline, 26.9% distillates, 9.6% resid, 7.4% av fuels, 15.1% others; plus imports. Does not include military draw on fuel some of which will be exported.
Aviation fuels	1,060	1,140	1,167	
Distillates	3,200	3,560	3,980	
Residual	2,750	3,150	2,894	
Other products	3,447	3,650	2,364	
Domestic demand	17,067	18,525	16,035	
Exports	240	218	200	
Total demand	17,307	18,743	16,235	

domestic energy supplies by all means and reduce consumption.

A look at '73. The Arab embargo came too late to change the record U.S. oil consumption in 1973.

Preliminary calculations indicate that supply slightly exceeded demand in 1973 and the industry was able to

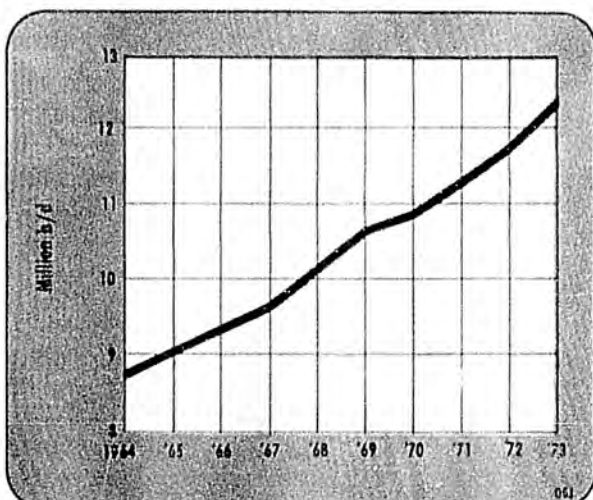
build inventories by a small margin. Estimates are 17,421,000 b/d for supply and 17,307,000 b/d for demand.

The supply came from total domestic production of 10,938,000 b/d, including 9,203,000 b/d of crude and condensate and 1,735,000 b/d of natural-gas liquids. Imports added another 6,135,000 b/d to

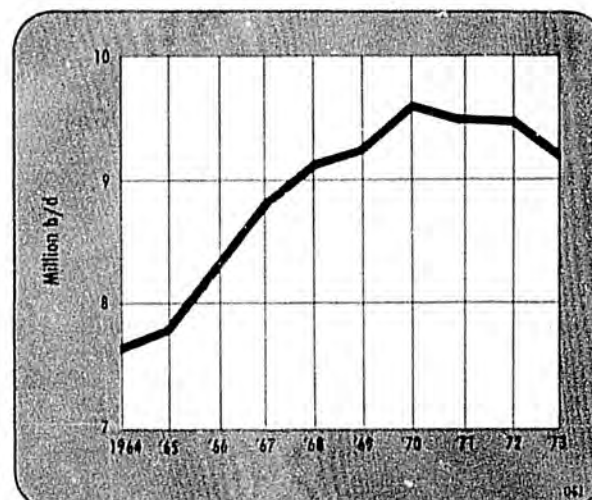
supply with crude shipments averaging 3,212,000 b/d and products 2,923,000 b/d.

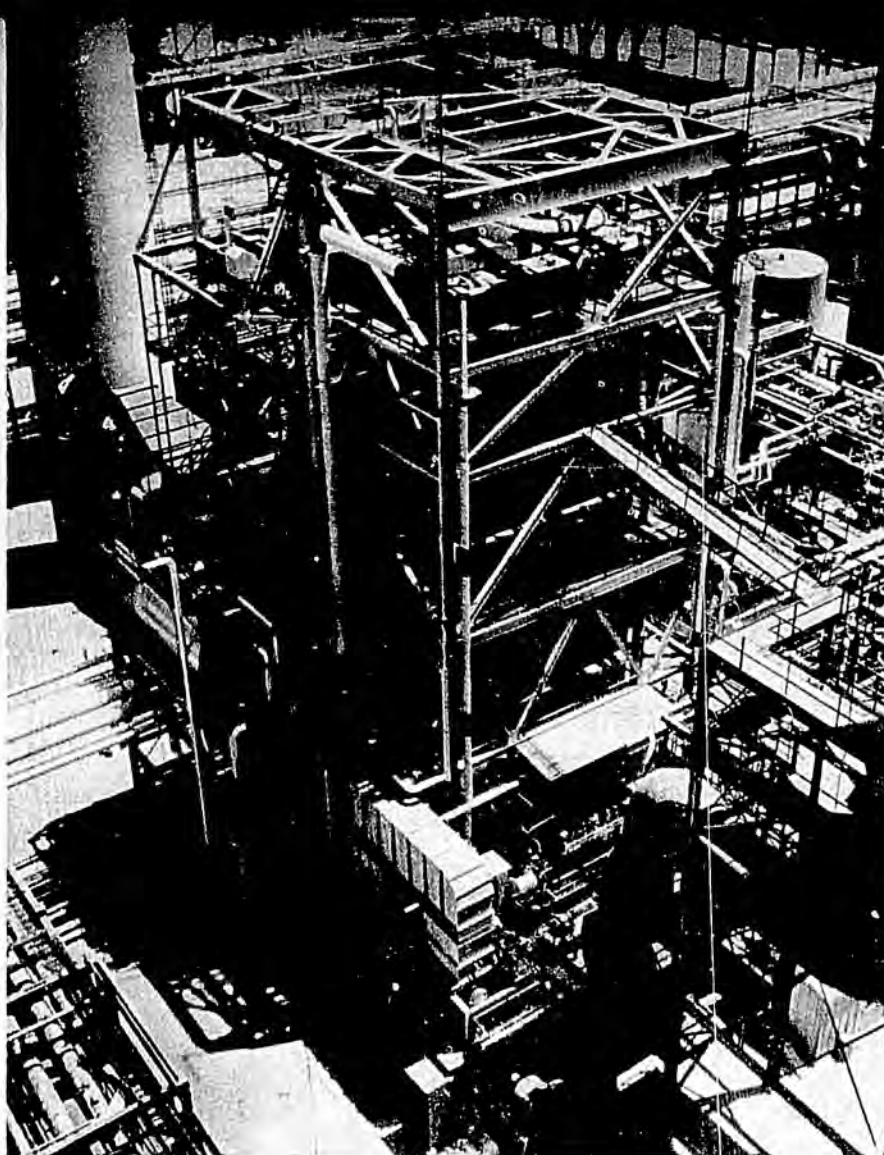
Demand for the major products saw gasoline consumption reach 6,610,000 b/d, distillates 3,200,000 b/d, residual 2,750,000 b/d, and aviation fuels 1,060,000 b/d. Domestic demand ran 17,067,-

Crude runs follow upward trend



Crude production declines





A POLLUTION FIGHTER in strange form but that's what this Badger Co. boiler is. The boiler eliminates carbon monoxide emissions and was installed by Getty Oil Co. as a part of its environmental program at the Delaware City, Del., refinery.

000 b/d and exports 240,000 b/d.

Early estimates for 1974 called for even greater increases in supply and demand. When company economists gathered for the IPAA's supply-demand committee's annual session in early October, the consensus was that 1974 demand would average 18,743,000 b/d after record 19,788,000 b/d demand in the first quarter and 19,900,000 b/d in the fourth quarter. The Arab embargo was imposed shortly afterwards, however, and these figures immediately became hopeless.

A look at '74. As for the 1974 supply-demand picture, there are as many different estimates as there are economists making them. The best formula is this: Supply this year is whatever you can get your hands on, and demand is whatever supply is. In other words, demand will be supply-limited.

One optimistic estimate, presented in the table on p. 109, calls for a supply total of 16,435,000 b/d at least

for the first half year which might be increased nearly to 17 million b/d by heavy withdrawal of crude and product inventories.

But there's nothing certain about any element in the outlook.

Take domestic production. Crude output was expected to decline to slightly above 9 million b/d this year from 9.2 million in 1973. But with currently higher crude prices—\$5.25/bbl for top "old" production and \$10/bbl for marginal and "new" production—operators are known to be planning programs and projects to step up production. But these efforts take time and may not become effective soon enough to offset the normal decline in the nation's aging fields. The range of estimates on domestic crude production thus range from a low of about 9 million b/d to as high as 9.4 million b/d on the optimistic side. Even the 9.2 million b/d used in the table could be too high.

There are several opinions on the

production level of natural-gas liquids. Early forecasts called for output of 1,725,000 b/d based on gas withdrawal remaining about steady with 1973. Some economists think the industry will be fortunate to keep NGL production at 1.7 million, but the more optimistic think an increase to 1,775,000 b/d is possible.

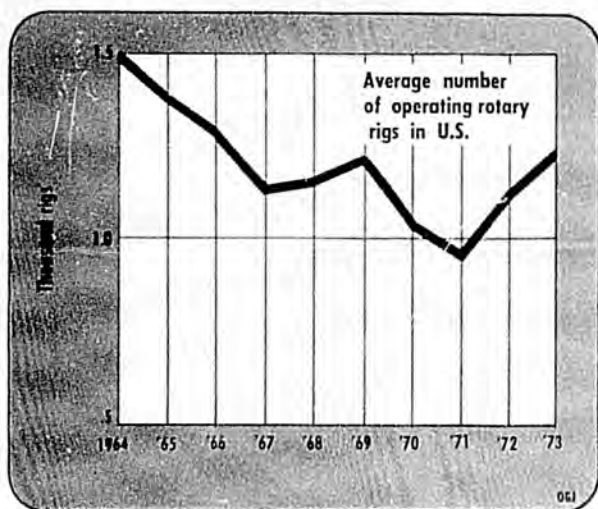
The big supply question for 1974, of course, is the level of imports. Best estimates are that imports under the present embargo will run from 1.5 million b/d to 1 million b/d less than last year or a total of 4-5 million b/d, about equally divided between crude and products. The more-optimistic 5-million-b/d level was used in the table.

Fitting refinery operations into this supply outlook will require some very interesting juggling of crude and product yields which for the first time is involving restrictions from the federal Government. Federal energy authorities at first estimated that refiners would be able to operate at only 85% of capacity and suggested a yield pattern of 39.2% gasoline, 27.9% middle distillates, 9.7% residual, 7.7% jet fuel, and 15.6% other products. This, of course, penalized gasoline production enormously in favor of other products, especially distillate and residual fuels.

Some economists question the advisability of cutting gasoline production that severely. They think that with luck crude supply will allow higher refinery operations and a yield of 42-44% on gasoline should be considered, particularly after the first quarter. Unless higher yields of gasoline are permitted, the necessity for rationing is believed inevitable; and may be so even with higher yields.

The table presented here assumes refinery input of 13,475,000 b/d—an optimistic assumption—will be available with permitted yields of 41% gasoline, 26.9% distillates, 9.6% resid, 7.4% aviation fuels, and 15.1% other products. With expected imports, this will allow gasoline production of 5,630,000 b/d, nearly 1 million b/d below 1973 demand and almost 1.5 million b/d below expected gasoline demand for 1974. Even higher yields still will leave a gap in gasoline supply which will require severe curtailment this summer. The gap can be narrowed by drawing on inventories, but stocks going into the motoring season are lower than normal and will provide only limited relief.

U.S. rig activity revives



A glance at the other product volumes which may be available show clearly how much of the shortage is being covered with gasoline. Aviation fuels available are estimated at 1,167,000 b/d. This normally would be sufficient, but this will be reduced sharply by military-fuel demands which may range from 300,000 to 600,000 b/d in the first part of the year. These will be mainly in jet fuels but will also affect the supply of others. Under the assumed yield pattern the volume of distillates and residual expected appear almost comfortable, but it's doubtful these yields will hold for the entire year under the pressure for more gasoline by mid-summer.

The calculations are not intended as a forecast of supply-demand for the year but are offered to illustrate the variety of assumptions that are necessary and the juggling of yields needed to produce the right volumes of fuels at the right time.

Hopefully, the Arab embargo will be eased considerably or lifted before the year is out and some of the pressure will be taken from U.S. petroleum supply. But higher prices alone will compel Americans to continue restricting consumption as much as possible and increase domestic production to the limit. Under present level of world prices, crude and products will lay into this country at about \$10/bbl. If import levels remain only at the 5-million-b/d mark, this will mean a cost of \$18.25 billion annually. Such a fuel bill will play havoc with this country's balance of trade. The old care-free days of high petroleum con-

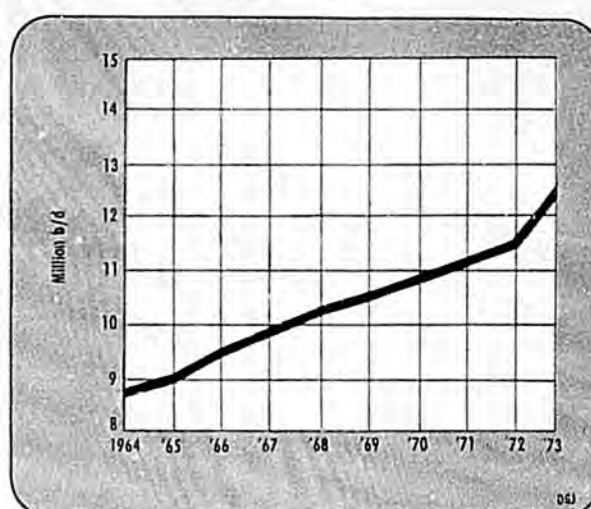
sumption at low cost clearly have come to an end.

A look back. From an operations standpoint, 1973 was not a vintage year for the U.S. petroleum industry. Although percentage gains in most instances were small, operating records still were established.

A quick rundown (for details see following tables) shows:

- Crude production dipped 2.9% to average 9,203,000 b/d compared with 1972's high mark of 9,477,000 b/d.
- Natural gas marketed increased 2% to average 62.9 billion cu ft/day for a record, and a record volume of 2.8 billion cfd was imported.
- Natural-gas liquids and liquefied refinery gases also set a production record of 2,081,000 b/d.
- Refiners averaged running 12,429,000 b/d of crude compared to 11,730,000 b/d in 1972 and operated their plants at 89.7% of capacity. Highest operating rates were reached by East Coast refiners at 95.7% and Mid-Continent refiners at 94.5%.
- Imports of crude averaged 3,212,000 b/d, also a record. Canada remained the major source of imported crude with shipments averaging 998,000 b/d, but Nigeria moved into second place with 461,000 b/d of imports while Saudi Arabia sent 445,000 b/d, Venezuela 318,000 b/d, Iran 191,000 b/d, and Libya 148,000 b/d.
- Imports of products averaged 2,923,000 b/d, up from 2,245,000 b/d in 1972. Residual represented by far the major imported product at 1,849,000 b/d with distillate imports reaching 377,000 b/d and kerosine jet fuel 163,000 b/d.

New U.S. crude supply



• Exports also increased slightly, causing a political flap in Congress where charges were heard that exports represented attempts by American oil companies to profiteer on world markets by shorting customers at home. Exports averaged 239,100 b/d for the year compared with 222,700 b/d in 1972 and with a record 307,100 b/d in 1967.

• Petroleum stocks at year-end topped 1 billion bbl, nearly 50-million-bbl higher than the year before but below the 1.04 billion mark of 1971.

• Drillers completed 27,863 wells including 8,008 wildcats during 1973 and made 139.6 million ft of hole. The outlook for 1974 is for 30,637 wells including 9,500 wildcats and 154.4 million ft of hole. Rotary-rigs active averaged 1,194 ranging from a low of 970 rigs at work to a high of 1,440. The rig activity was the best since 1969.

The drilling statistics were a disappointment since operators had expected to complete more than 31,000 wells in 1973. That goal ran into problems of weather early in the year and a shortage of casing and drill pipe in the later months.

But the higher level of crude and product prices are stirring the industry into expansion plans for 1974 and the years ahead. Operators are planning bigger drilling programs, enhanced recovery projects, and substantially larger capital outlays for plants and facilities.

This is the only answer to what happened in 1973 and the only way out if the nation is to escape zero growth and constant restraints on energy consumption.

END

U.S. production of crude oil and lease condensate

	Percent change	(Thousands of barrels daily)											Total* 1859-1972
		1973†	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	
District I:													
Fla., N.Y., Pa., W.Va.	+65.2	109	66	36	31	29	28	31	32	32	30	30	2,050,635
Total District I	+65.2	109	66	36	31	29	28	31	32	32	30	30	2,050,635
District II													
Illinois	-13.6	83	96	107	120	139	154	162	169	175	192	205	2,981,903
Indiana	-17.7	14	17	18	21	21	24	28	31	30	31	33	442,156
Kansas	-8.4	185	202	215	232	243	258	272	284	287	290	299	4,563,265
Kentucky	-7.7	24	26	29	32	35	38	43	49	53	54	50	614,873
Michigan	+8.3	39	36	33	32	33	35	37	39	40	43	44	625,053
Nebraska	-16.7	20	24	28	31	33	36	37	38	47	52	60	343,155
North Dakota	-5.4	53	56	59	60	62	68	69	74	72	70	69	416,302
Ohio	+4.5	23	22	23	27	30	30	27	30	35	43	17	792,172
Oklahoma	-7.1	527	567	584	613	616	611	632	615	557	555	553	11,000,841
Other		2	2	2	1	2	3	1	1	1			8,618
Total District II	-7.5	970	1,048	1,098	1,169	1,214	1,257	1,308	1,330	1,297	1,330	1,330	21,788,338
District III:													
Alabama	+22.2	33	27	21	20	21	21	20	22	22	23	25	139,808
Arkansas	-1.7	50	51	50	49	49	53	58	65	71	73	75	1,379,948
Louisiana	-8.3	2,251	2,455	2,562	2,485	2,314	2,233	2,122	1,848	1,630	1,502	1,411	14,836,941
Gulf Coast	-8.3	2,140	2,334	2,438	2,355	2,181	2,094	1,971	1,699	1,478	1,356	1,273	+
Rest of state	-8.3	111	121	124	130	133	139	151	149	152	146	138	+
Mississippi	-7.2	155	167	176	178	176	160	157	151	154	155	161	1,458,007
New Mexico	-9.3	274	302	324	351	354	351	346	340	327	311	301	3,073,214
Texas		3,569	3,565	3,351	3,424	3,156	3,097	3,067	2,898	2,742	2,704	2,679	38,153,093
Gulf Coast	-1.8	703	716	654	694	631	609	591	539	515	524	516	+
West Texas	+1.6	1,797	1,769	1,646	1,634	1,497	1,453	1,427	1,352	1,262	1,212	1,195	+
East Texas field	+2.8	217	211	186	199	159	145	142	124	111	119	120	+
Rest of state	-1.6	852	869	865	897	869	890	907	883	854	849	848	+
Total District III	-3.6	6,332	6,567	6,484	6,507	6,070	5,915	5,770	5,324	4,946	4,768	4,652	59,041,011
District IV:													
Colorado	+10.0	99	90	75	68	78	87	93	92	92	95	105	1,030,731
Montana	+1.1	94	93	95	104	120	132	66	97	90	84	84	829,856
Utah	+21.1	86	71	65	64	64	64	66	66	69	78	92	462,529
Wyoming	+1.0	390	386	405	439	424	394	373	368	379	379	396	3,794,577
Total District IV	+4.5	669	640	640	675	686	677	628	623	630	636	677	6,117,693
District V:													
Alaska	-1.5	199	202	218	229	202	181	80	39	31	30	29	553,562
Arizona	-33.3	2	3	3	5	7	9	8					15,192
California	-3.1	922	951	982	1,020	1,028	1,026	984	946	867	820	824	16,447,891
Coastal region	+1.4	215	212	237	222	180	176	191	190	182	178	184	+
Los Angeles region	-7.0	362	389	392	430	465	453	380	340	296	279	279	+
San Joaquin Valley	-1.4	345	350	353	368	383	397	413	416	389	363	361	+
Nevada						1	1	1	1	1			2,949
Total District V	-2.9	1,123	1,156	1,203	1,254	1,238	1,217	1,073	986	899	850	853	17,019,594
U.S. Total	-2.9	9,203	9,477	9,461	9,636	9,237	9,094	8,810	8,295	7,804	7,614	7,542	106,017,271

*Thousand of barrels. †Preliminary. ‡Not available.

Supply and demand of crude in the U.S.

	(Thousands of barrels daily)												
	1973*	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961
SUPPLY:													
Crude imports	3,212	2,222	1,681	1,324	1,409	1,290	1,128	1,225	1,238	1,199	1,131	1,126	1,045
Crude production	9,203	9,477	9,463	9,637	9,238	9,095	8,810	8,295	7,804	7,614	7,542	7,332	7,183
Total new supply	12,415	11,699	11,144	10,961	10,647	10,385	9,938	9,520	9,042	8,813	8,673	8,458	8,228
DEMAND:													
Crude refinery runs	12,429	11,731	11,199	10,870	10,629	10,312	9,815	9,444	9,043	8,807	8,687	8,410	8,183
Crude transfers	20	12	17	14	14	14	12	12	13	12	11	14	13
Crude exports	1	1	1	14	4	5	73	4	3	4	5	5	9
Crude loss	13	13	12	11	11	11	9	10	10	10	10	9	9
Total crude demand	12,463	11,757	11,299	10,909	10,658	10,342	9,909	9,470	9,069	8,833	8,713	8,438	8,214
Stock change	-48	-58	-46	+31	-11	+43	+29	+50	-27	-20	-40	+20	+14

*Preliminary.

Rotary-rig activity by states

	Peak No.	Low No.	Average rig activity									
			1973	1972	1971	1970	1969	1968	1967	1966	1965	1964
Alabama	18	7	13	15	8	7	6	3	2	2	1	2
Alaska	10	0	5	5	5	14	28	20	21	13	6	5
Inland	8	0	4	4	5	12	18	3	5	5	3	3
Offshore	3	0	1	1	0	2	10	17	16	8	3	2
Arkansas	23	8	15	15	15	13	16	7	8	10	11	9
Arizona	5	0	2	1	1	0	2	1	3	1	1	2
California	68	34	51	46	46	52	78	87	83	79	89	93
Inland	65	33	49	45	40	42	61	65	67	70	83	87
Offshore	4	0	2	1	6	10	17	22	16	9	6	6
Colorado	58	23	42	35	30	25	23	17	16	16	19	21
Florida	15	5	9	19	11	4	1	1	2	2	4	1
Georgia	2	0	1	0	0	0	0	0	0	0	0	0
Idaho	2	0	1	0	0	0	0	0	0	0	0	0
Illinois	11	1	6	14	13	14	17	22	30	30	24	20
Indiana	2	0	0	1	1	1	1	2	3	5	5	6
Iowa	1	0	1	0	1	0	0	0	0	1	0	0
Kansas	45	8	28	24	29	30	38	35	41	55	70	87
Kentucky	3	0	1	2	2	1	2	5	9	13	12	8
Louisiana	253	161	205	214	194	204	230	233	235	256	270	282
North	31	15	23	19	16	12	19	19	20	23	30	27
Inland waters	66	43	55	54	50	57	57	64	66	72	72	83
South	76	37	56	59	54	56	69	59	58	63	73	81
Offshore	97	56	71	82	74	79	85	91	91	98	95	91
Maryland	1	0	0	1	0	0	1	1	0	4	2	2
Michigan	26	10	20	17	12	11	10	10	10	9	11	13
Mississippi	44	23	29	37	39	43	40	36	33	34	35	39
Missouri	1	0	1	0	0	0	0	0	0	1	0	0
Montana	28	9	19	20	17	17	31	34	22	24	26	21
Nebraska	10	1	5	6	5	6	10	5	5	8	10	11
Nevada	2	0	0	0	1	0	0	2	1	1	2	1
New Mexico	86	40	62	55	47	40	64	68	56	60	65	79
New York	6	0	1	0	1	0	0	1	1	1	1	1
North Carolina	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota	17	5	10	7	9	9	12	13	11	12	12	14
Ohio	48	21	36	22	17	24	22	22	18	14	22	56
Oklahoma	150	80	115	90	90	98	120	106	101	141	163	158
Oregon	1	0	0	0	0	0	0	0	0	1	1	0
Pennsylvania	19	6	11	8	9	9	7	5	7	10	9	11
South Dakota	3	0	1	1	1	2	1	1	0	0	2	1
Tennessee	2	0	0	0	1	2	1	0	1	1	0	0
Texas	454	328	376	322	291	302	322	329	340	387	425	477
Gulf Coast	143	82	109	91	79	73	77	88	90	103	112	135
Offshore	18	6	9	6	5	6	10	6	7	8	5	2
North	29	14	22	16	15	17	25	25	28	31	34	42
Panhandle	29	15	23	22	16	19	19	20	21	23	25	31
East	37	15	30	26	23	25	37	34	36	38	40	43
West Central	104	73	82	71	76	77	74	67	67	82	102	121
West	115	32	101	90	77	85	80	89	91	102	107	103
Utah	49	19	38	34	17	12	12	12	15	14	14	17
Virginia	3	0	1	0	1	1	0	0	0	0	1	1
Washington	0	0	0	0	0	0	0	0	1	1	0	0
West Virginia	32	5	20	16	17	16	18	16	15	19	24	16
Wyoming	105	31	70	60	45	71	81	56	44	48	50	48
Total U.S.	1,440	971	1,194	1,087	976	1,028	1,194	1,150	1,134	1,273	1,387	1,502
Canada West	272	70	175	148	120	131	149	150	144	156	163	149
Canada East	9	0	4	4	4	3	2	1	1	1	2	1
Grand Total	1,627	1,043	1,373	1,239	1,100	1,162	1,345	1,301	1,279	1,430	1,552	1,652

Source: Hughes Tool Co. Note: Peak and low figures may not add to totals.

Drillers in 1973 failed

Well forecast for 1974

State	1973 estimate			1974 forecast				Change from 1973	
	Total wells 1973*	Total wildcats 1973*	Total footage 1973 (1,000 ft)	Total wells 1974	Wildcat wells 1974	Field wells 1974	Total footage (1,000 ft)	Total wells	
Alabama	108	80	1,196	114	71	43	1,263	+	6
Alaska	32	11	300	38	15	23	361	+	6
Arizona	9	4	23	10	10	0	26	+	1
Arkansas	289	84	1,703	329	169	160	1,939	+	40
California	1,252	189	4,071	1,641	219	1,422	5,342	+	389
Onshore	1,192	188	3,850	1,561	214	1,347	5,051	+	369
Offshore	60	1	221	80	5	75	291	+	20
Colorado	870	464	5,008	1,097	622	475	6,314	+	227
Florida	72	34	980	71	34	37	967	-	1
Georgia	2	2	12	3	3	0	18	+	1
Idaho	4	4	29	1	1	0	7	-	3
Illinois	524	177	1,212	621	197	424	1,436	+	97
Indiana	249	114	350	275	189	86	387	+	26
Kansas	2,341	794	7,765	2,581	897	1,684	8,561	+	240
Kentucky	686	155	1,070	702	171	531	1,095	+	16
Louisiana	2,658	753	21,868	2,914	862	2,052	23,462	+	256
North	817	131	3,060	971	142	829	3,636	+	154
South	1,184	384	12,426	1,219	471	748	12,793	+	35
Offshore	657	238	6,382	724	249	475	7,033	+	67
Michigan	275	194	1,428	444	384	60	2,306	+	169
Mississippi	386	227	3,771	481	284	197	4,699	+	95
Missouri	9	9	18	3	3	0	6	-	6
Montana	635	419	1,892	789	575	214	2,351	+	154
Nebraska	174	102	884	164	89	75	854	-	10
New Mexico	1,252	246	6,379	1,336	286	1,050	6,781	+	84
East	750	167	4,507	789	211	578	4,741	+	39
West	502	79	1,872	547	75	472	2,040	+	45
New York	104	10	135	121	14	107	158	+	17
North Carolina	0	0	0	1	1	0	0	+	1
North Dakota	124	67	854	126	67	59	868	+	2
Ohio	1,524	44	6,340	1,500	32	1,468	6,244	-	24
Oklahoma	2,588	394	13,590	2,644	381	2,263	13,884	+	56
Oregon	3	3	5	0	0	0	0	-	3
Pennsylvania	1,053	77	2,399	1,079	78	1,001	2,458	+	26
South Dakota	22	21	95	34	30	4	146	+	12
Tennessee	101	57	152	161	67	94	241	+	60
Texas	8,751	2,775	46,776	9,284	3,050	6,234	51,147	+	533
District 1	544	238	1,894	575	240	335	2,001	+	31
District 2	534	349	3,231	561	400	161	3,395	+	27
District 3	877	487	5,865	841	520	321	5,625	-	36
District 4	741	451	4,631	728	419	309	4,709	-	13
District 5	96	54	678	97	53	44	685	+	1
District 6	325	84	2,034	361	120	241	2,549	+	36
District 7-B	901	295	2,643	1,102	389	713	3,232	+	201
District 7-C	864	195	4,821	844	184	660	4,710	-	20
District 8	1,387	133	9,100	1,460	162	1,298	9,579	+	73
District 8-A	1,050	106	5,316	1,119	119	1,000	7,270	+	69
District 9	916	238	2,697	1,048	264	784	3,085	+	132
District 10	449	83	3,129	427	75	352	2,976	-	22
Offshore	67	62	737	121	105	16	1,331	+	54
Utah	184	64	1,654	225	89	136	2,023	+	41
Virginia	0	0	0	2	2	0	14	+	2
Washington	0	0	0	0	0	0	0		
West Virginia	722	72	2,248	787	109	678	2,451	+	65
Wyoming	860	362	5,373	1,059	499	560	6,617	+	199
Total U.S.	27,863	8,008	139,580	30,637	9,500	21,137	154,426	+	2,774
Canada*	4,771	1,360	16,470	5,068	1,582	3,486	17,582	+	297
West	4,474	1,330	15,770	4,735	1,560	3,175	16,900	+	261
Alberta	3,544	1,048	12,460	3,627	1,091	2,536	12,749	+	83
B.C.	161	73	839	246	127	119	1,281	+	85
Manitoba	16	16	47	27	27	0	79	+	11
North Arctic	78	71	602	107	101	6	826	+	29
Saskatchewan	675	122	1,822	728	214	514	1,965	+	53
East offshore	30	30	307	22	22	0	225	-	8
Ontario	267		393	311		311	457	+	44

*Estimated.

to sink as many wells as they did in '72

How the top 20 companies line up

State	1974 Fore- cast	Total wells				wildcats	Fore- cast 1974
		1973	1972	1971	1970	1973	
Alabama	19	21	36	23	15	7	8
Alaska	24	21	15	31	62	6	10
Arizona	0	0	10	2	0	0	0
Arkansas	23	15	20	30	20	1	3
California	1,194	567	839	1,431	1,561	44	58
Onshore	1,179	562	827	1,388	1,483	43	53
Offshore	15	5	12	43	78	1	5
Colorado	109	54	228	225	98	10	24
Florida	21	36	64	32	32	7	11
Georgia	3	2	0	0	0	2	3
Idaho	1	4	0	0	0	4	1
Illinois	166	88	59	84	80	1	0
Indiana	0	1	1	1	0	1	0
Kansas	57	60	322	50	37	5	8
Kentucky	6	3	20	3	24	1	2
Louisiana	1,051	862	1,156	1,044	1,192	173	212
North	138	66	82	166	140	5	17
South	453	471	491	507	592	35	66
Offshore	460	305	583	371	460	133	129
Michigan	191	117	135	51	44	28	33
Mississippi	58	39	75	128	145	14	26
Missouri	3	8	0	0	0	8	0
Montana	44	34	50	40	26	21	18
Nebraska	1	3	6	7	9	1	0
Nevada	0	0	1	2	1	0	0
New Mexico	250	154	223	171	188	22	22
East	205	139	164	132	145	19	21
West	45	15	59	39	43	3	1
New York	2	4	9	2	0	4	2
North Carolina	1	0	0	2	0	0	1
North Dakota	14	11	13	19	19	9	4
Ohio	9	5	8	5	54	0	1
Oklahoma	292	223	291	326	328	25	24
Oregon	0	1	0	0	0	1	0
Pennsylvania	263	41	14	11	0	5	7
South Dakota	6	1	1	0	0	0	3
Tennessee	1	0	0	0	0	0	1
Texas	1,818	1,547	2,138	1,686	2,166	166	256
District 1	230	104	113	24	98	10	7
District 2	49	66	54	52	46	5	7
District 3	253	175	262	263	235	12	29
District 4	234	250	264	295	329	22	13
District 5	18	6	6	9	14	6	5
District 6	56	33	43	51	55	4	8
District 7-B	11	32	22	23	33	1	1
District 7-C	78	93	52	52	50	8	13
District 8	409	389	635	526	674	21	39
District 8-A	234	230	361	294	513	8	9
District 9	41	35	238	32	43	1	0
District 10	84	110	54	40	57	48	10
Offshore	121	24	34	25	19	20	105
Utah	111	100	101	41	17	10	12
Virginia	2	0	0	0	0	0	2
Washington	0	0	3	0	12	0	0
West Virginia	142	22	35	28	18	0	23
Wyoming	182	112	330	223	322	16	43
Total U.S.	6,064	4,156	6,203	5,696	6,470	592	818

THE drilling end of the U.S. oil industry failed to drill as many wells in 1973 as it had previously planned.

U.S. operators completed an estimated 27,863 wells last year compared to the nearly 31,000 planned earlier in the year. Many factors figured into this decline in drilling, mostly weather, lack of steel, dwindling crews, and economic conditions.

Last year's total of 27,863 wells included 8,008 wildcats. Total footage drilled was 139,580,000 ft. The complete listing of 1973 well completions in all categories will be published by the API and printed in The Journal later in the quarter.

Things look much brighter for the 1974 drilling outlook. The industry looks for 30,637 wells to be drilled this year. Of this total 9,500 will be wildcats, an 18.6% increase over 1973. Total drilling will increase 9.9% over the 1973 tally. Footage to be drilled this year is 154,426,000 ft, a healthy gain over the previous year. The 1974 total includes 21,137 field wells.

A comprehensive Journal survey of operators throughout the oil kingdom covered more than 10,000 wells for 1973. The top 20 companies in the nation plan to drill 6,064 wells this year, up considerably over the 4,156 drilled in 1973. The accompanying table notes the data for past years. Big operators will drill 818 wildcats in 1974, also up considerably over the 1973 figure. Nearly every state shows an increase in total drilling.

The better drilling picture in the U.S. for 1974 is bolstered by the high number of rotary rigs working in various areas. Large increases are noted in California, up 389 wells, the best climb in recent years. Offshore operators plan 80 wells off the California Coast this year compared to 60 in 1973. Another large drilling increase will be posted in Colorado, up 227 wells over 1973. Denver basin drilling is still very active and will increase this year. Kansas drilling totals will rise 240 wells this year, a rarity in recent years. Louisiana will see a good year with 256 more wells than in 1973. Much of this increase will be in North Louisiana rather than in the southern parishes and offshore.

Michigan's Silurian reef play plus new Ordovician interest will up the state's total by 169 wells. Montana's shallow gas play will help along a busy year with 154 more wells on

the books. Texas will post a good drilling year, one of the best in recent countings. The state will drill 533 more wells than in 1973 with largest increase noted for North Central Texas, and in western counties. Finally, Wyoming will drill 199 more wells this year than last as a gas and oil play sweeps through the Powder River and Green River basins.

Canada will drill 297 more wells this year than last. Total wells should be about 4,735, compared to an estimated 4,474 wells in 1973. All provinces will have gains as will the northern and Arctic regions. Only decline will be off the East Coast in Atlantic Ocean exploration.

Total wildcats to be drilled in Canada this year will be 1,582 compared to 1,360 in 1973.

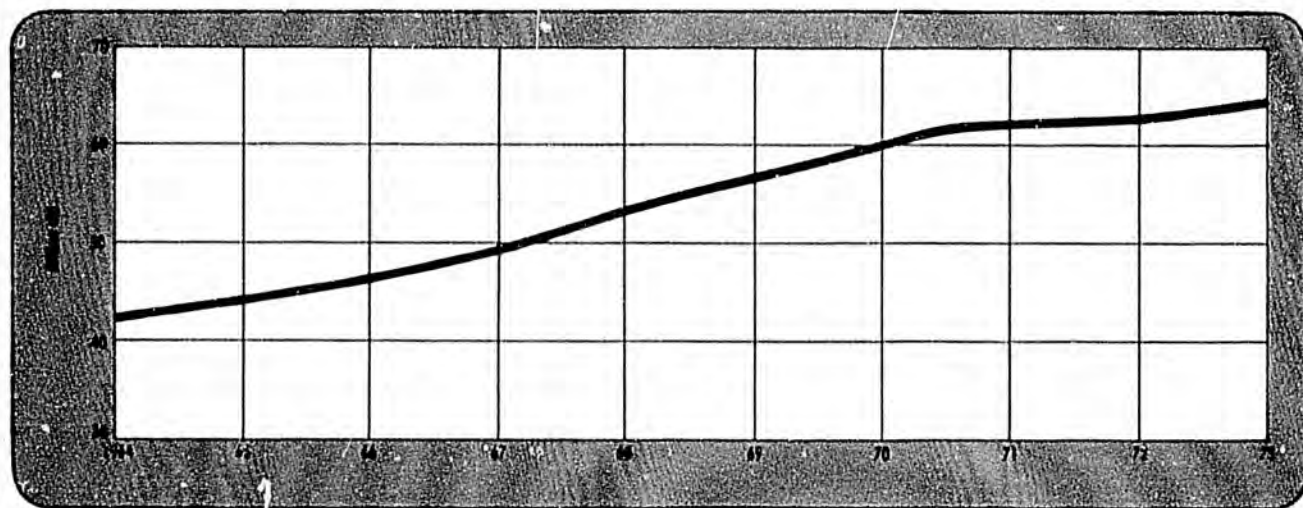
Marketed production of natural gas

(Million cubic feet per day)

	1973*	Actual 1972	1971	1970	1969	1968	1967	1966	1965	1964
Alaska	397	344	333	306	139	47	40	29	20	17
Arkansas	459	456	473	497	464	428	319	296	227	208
California	1,428	1,335	1,678	1,778	1,857	1,953	1,866	1,965	1,809	1,814
Colorado	363	320	297	290	325	332	320	326	346	312
Kansas	2,479	2,436	2,425	2,466	2,420	2,283	2,389	2,322	2,174	2,099
Louisiana	23,083	21,843	22,142	21,338	19,802	17,530	15,664	13,967	12,238	11,408
Michigan	105	94	70	106	99	111	92	105	95	86
Mississippi	276	285	325	345	360	369	382	381	457	496
Montana	155	92	90	117	113	53	71	99	77	68
Nebraska	13	10	10	16	19	22	23	27	29	30
New Mexico	3,340	3,332	3,199	3,121	3,118	3,181	2,925	2,770	2,568	2,401
Oklahoma	4,927	4,950	4,614	4,370	4,175	3,800	3,871	3,318	3,619	3,616
Texas	23,555	23,720	23,427	22,898	21,516	20,479	19,697	19,165	18,181	17,829
Utah	115	108	116	117	128	126	134	144	196	219
W. Virginia	585	589	641	664	635	647	579	585	568	557
Others	1,702	1,817	1,785	1,628	1,538	1,431	1,412	1,396	1,340	1,317
TOTAL	62,983	61,731	61,625	60,057	56,708	52,792	49,784	46,895	43,944	42,477
Volume Gain	1,252	106	1,568	3,349	3,916	3,008	2,889	2,951	1,467	2,061
Percent Gain	2.0	0.2	2.6	5.9	7.4	6.0	6.2	6.7	3.5	5.1
Imports	2,853	2,793	2,562	2,249	1,986	1,781	1,545	1,285	1,252	1,211
Exports	274	214	219	191	140	256	225	155	65	54

*Preliminary.

Marketed gas output stays level

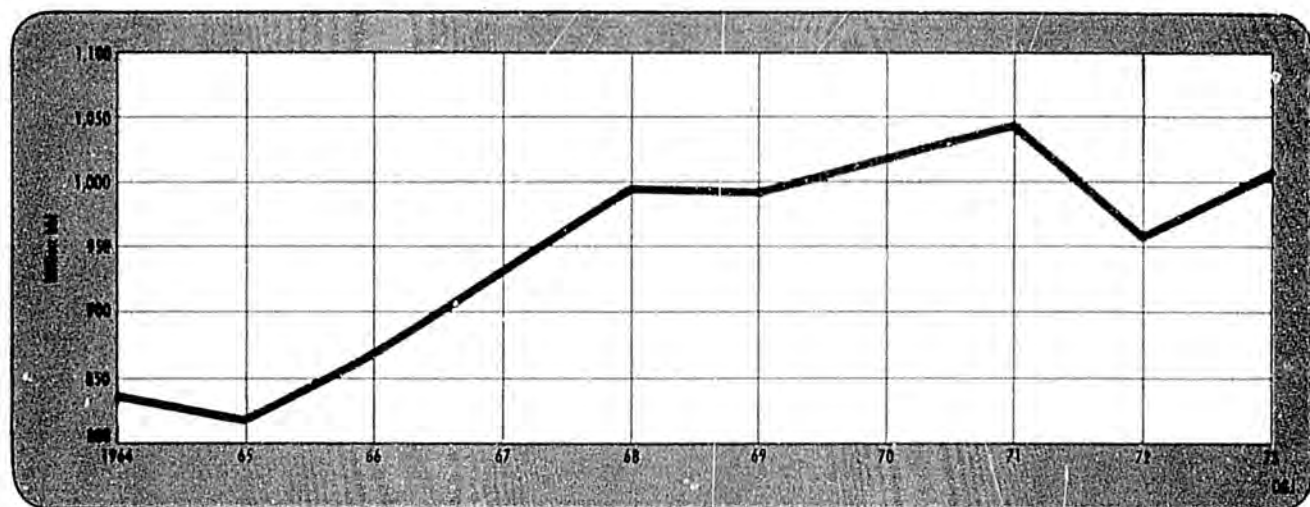


Refinery runs by districts

	(Thousands of barrels daily)												
	% of capacity	1973†	% of total 1972	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
East Coast	95.7	1,337	9.9	1,161	1,181	1,147	1,252	1,176	1,145	1,143	1,089	1,106	1,143
Appalachian: Dist 1	92.6	175	1.4	161	150	143	57	127	122	116	111	106	103
Total Dist 1	95.3	1,512	11.3	1,322	1,331	1,250	1,309	1,303	1,267	1,259	1,200	1,212	1,246
Appalachian: List 2	91.7	55	.5	54	55	60	63	59	60	78	101	101	93
Ill., Ind., Ky.	89.7	2,261	18.2	2,134	2,054	1,995	1,868	1,830	1,778	1,731	1,632	1,579	1,561
Minn., Wis., Dak.	89.0	242	1.9	228	217	200	198	185	164	162	153	147	134
Okla., Kan., Mo.	94.5	923	7.7	904	904	899	884	885	847	818	759	744	746
Total Dist. 2	90.9	3,481	28.3	3,320	3,230	3,154	3,013	2,959	2,849	2,789	2,645	2,571	2,540
Texas:													
Inland	93.2	425	3.5	416	401	395	388	371	350	340	321	316	310
Gulf Coast	86.6	2,782	22.5	2,635	2,523	2,450	2,407	2,359	2,283	2,185	2,116	2,088	2,092
Louisiana Gulf	90.7	1,656	13.7	1,604	1,377	1,317	1,285	1,214	1,101	979	911	853	776
N. La.-Ark.	76.9	133	1.1	132	148	154	145	142	135	128	126	123	120
New Mexico	73.0	46	.4	45	42	41	39	37	34	34	32	30	27
Total Dist. 3	88.0	5,042	41.2	4,832	4,491	4,357	4,264	4,123	3,903	3,666	3,506	3,410	3,325
Total Dist. 4	85.6	410	3.4	398	405	393	385	366	344	338	330	319	307
Total Dist. 5	88.8	1,984	15.8	1,858	1,742	1,676	1,658	1,567	1,452	1,392	1,362	1,295	1,269
Total U.S.	89.7	12,429	100.0	11,730	11,199	10,870	10,629	10,318	9,815	9,444	9,043	8,807	8,687

†Preliminary.

Total stocks head upward



Refined product, natural-gas-liquid, and crude stocks

Refined product stocks	1973*	1972	1971	1970	(Thousands of barrels)					
					1969	1968	1967	1966	1965	1964
Gasoline	210,500	217,149	223,771	214,348	217,392	211,526	207,715	194,177	183,058	193,622
Motor	207,000	212,894	219,352	209,255	211,199	204,496	199,790	186,393	174,717	185,755
Aviation	3,500	4,255	4,419	5,093	6,193	7,030	7,925	7,784	8,341	7,867
Special naphtha	4,700	5,232	5,384	6,193	6,292	5,829	5,742	5,583	6,209	5,879
Kerosine	23,000	19,111	24,438	27,848	26,780	23,480	25,008	24,004	24,080	27,325
Distillate	202,500	154,319	190,622	195,271	171,714	173,158	159,674	154,096	155,407	155,846
Residual	53,000	55,216	59,681	53,994	58,395	65,359	65,597	61,196	56,214	40,403
Kerosine jet fuel	22,000	19,346	20,747	20,989	19,517	15,373	13,174	12,139	10,361	8,840
Naphtha jet fuel	5,400	6,147	6,990	6,621	8,556	8,904	9,023	7,235	8,388	9,904
LRG	8,500	7,781	7,361	5,645	5,050	4,373	44,925	44,336	43,665	43,692
Unfinished oils	96,800	94,761	100,574	98,989	97,819	93,399	90,201	89,535	88,609	87,014
Other refined prod.	53,500	49,279	51,203	43,152	43,125	46,725	48,340	43,350	44,197	40,973
Total product stocks	679,900	628,341	690,771	673,059	654,640	648,126	629,339	595,651	580,188	573,498
Nat.-gas-liquids stk.	83,000	79,238	93,528	68,435	60,256	77,253	62,969	40,423	35,867	35,679
Crude stocks	243,000	246,395	259,648	276,367	265,227	272,193	248,970	238,391	220,289	230,057
Total stocks	1,005,900	953,974	1,043,947	1,017,861	980,123	997,572	941,338	874,465	836,344	839,234

*Preliminary. †Includes LRG for chemical use previously reported in petrochemical feedstocks.

Crude imports by origin

	1973*	1972	1971	(Thousands of barrels daily)			1967	1966	1965	1964
				1970	1969	1968				
Bolivia	1		2	2	15.3	18.8	19.2	3.4		
Chile			1		4.7					
Colombia	2	5	9	20	42.6	32.7	32.5	39.5	41.7	26.2
Ecuador	43									
Mexico	1				1.0				6.9	9.8
Trinidad	63	24				5.4	3.5			
Venezuela	318	256	303	268	306.1	343.5	359.1	403.9	432.5	476.0
Latin America Total	428	285	315	290	369.7	400.4	414.3	446.8	481.1	512.0
Algeria	140	87	13	6	1.0	5.3	4.0	3.8	8.9	6.1
Angola	40	16	4							
Egypt	13	8	19	21	40.5	29.5	3.6	2.3	2.4	3.0
Libya	148	110	53	47	133.9	113.6	41.9	69.0	41.6	39.4
Nigeria	461	244	95	40	49.2	8.6	3.9	11.3	14.5	
Tunisia	14	7								
Africa total	816	472	184	122	224.6	157.0	53.4	86.4	67.4	48.5
Kuwait	44	36	29	33	34.4	43.3	18.8	26.1	55.4	63.6
Saudi Arabia	445	174	115	17	34.7	51.8	81.3	125.4	132.2	96.9
Neutral Zone				23	43.5	29.4	11.0	19.3	26.7	48.0
Iran	191	136	106	33	41.9	57.8	55.2	84.5	78.5	65.9
Iraq	5	4	11				4.7	25.9	15.6	
Qatar	8	3			0.5			0.5	11.9	19.9
Abu Dhabi			80	63	13.8	15.3	5.3	13.1	13.8	3.0
United Arab Emirates†	76	74								
Middle East Total	769	427	341	169	168.8	197.6	186.3	294.8	334.1	297.3
Canada	998	856	721	672	557.0	462.9	412.1	347.1	295.2	277.6
Far East	201	167	117	70	88.4	72.6	61.7	49.9	60.7	63.0
Total crude	3,212	2,207	1,678	1,323	1,408.5	1,290.5	1,127.8	1,225.0	1,238.5	1,198.4

*Preliminary. †Abu Dhabi prior to 1972.

Imports of refined products

	1973*	1972	1971	(Thousands of barrels daily)			1967	1966	1965	1964
				1970	1969	1968				
Gasoline	114	68	59	67	62.2	59.0	42.7	48.1	37.1	40.0
Kerosine	2	1	1	4	2.6	0.5	0.1	0.6	0.3	
Jet-fuel kerosine	163	162	150	125	110.7	85.8	73.8	51.4	36.9	30.4
Jet-fuel naphtha	24	33	30	19	14.1	19.4	14.9	34.4	45.2	33.1
Distillate	377	182	153	147	139.4	131.5	50.7	37.9	35.7	32.2
Residual	1,849	1,746	1,583	1,528	1,264.7	1,120.0	1,084.3	1,032.3	944.1	808.1
Unfinished oils	136	125	124	108	106.2	80.2	96.2	96.5	92.3	89.0
Other	1258	1215	1145	97	57.5	52.9	45.9	46.9	37.7	27.5
Total U.S.	2,923	2,532	2,245	2,095	1,757.4	1,549.3	1,408.6	1,348.1	1,229.3	1,060.3

*Preliminary. †Includes plant condensate 1973, 103; 1972, 86; 1971, 36.

Exports of refined products—and crude

	1973*	1972	1971	(Thousands of barrels daily)			1967	1966	1965	1964
				1970	1969	1968				
Gasoline	2.9	2.6	4.5	3.8	6.7	5.7	18.8	15.9	17.6	22.0
Distillate	8.9	3.3	7.6	2.5	3.1	4.2	11.7	12.0	10.0	14.7
Residual	31.4	33.0	36.2	54.2	46.3	54.7	60.1	35.3	40.8	51.6
Lubricants	38.4	41.1	43.4	44.1	44.9	49.2	51.2	46.9	45.7	49.7
Coke	96.3	85.1	74.0	83.7	63.1	53.3	44.6	39.6	32.4	37.2
Asphalt	.9	0.9	0.8	1.0	1.3	1.2	1.3	1.3	1.1	2.1
LP-gas	30.6	31.4	25.7	27.3	35.1	29.0	25.4	22.4	20.6	14.6
Other refined products	28.3	24.8	30.6	28.6	28.2	28.8	21.3	21.0	14.7	6.2
Crude	1.4	0.5	1.4	13.6	3.9	4.9	72.7	4.0	3.0	3.7
Total U.S.	239.1	222.7	224.2	258.8	232.6	231.0	307.1	198.4	185.9	201.8

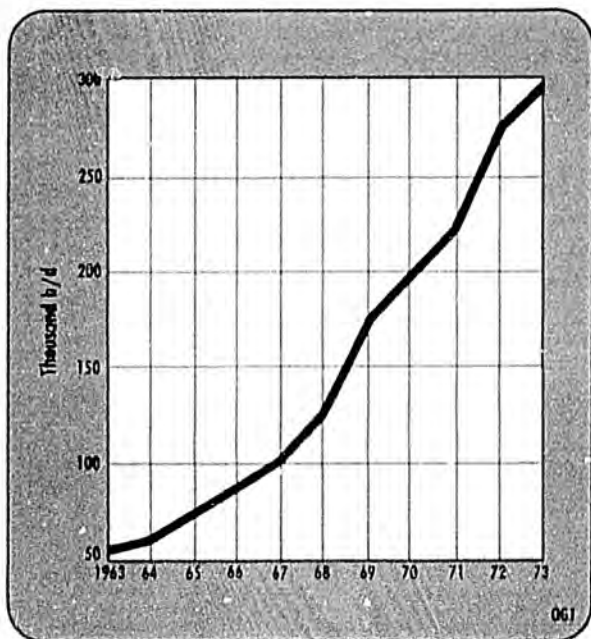
*Preliminary

Production of natural-gas liquids and liquefied refinery gases

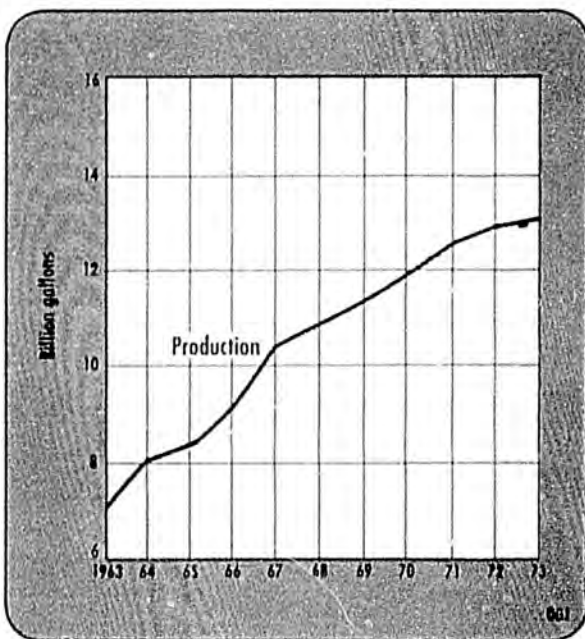
	1973*	1972	1971	1970	1969	1968	1967	1966	1965	1964
(Thousands of barrels daily)										
Ethane (from gas processing)	297	276	221	201	173	125	101	82	73	64
LP-gases:										
Propane	573	587	581	555	535	504	465	409	372	354
Butane	242	242	243	239	237	216	207	192	170	160
Butane-propane mix	10	10	11	16	16	34	42	36	24	30
Isobutane	94	92	88	84	74	81	80	73	67	62
Total LP-gases	919	931	923	894	862	835	794	710	633	606
Natural gasoline‡	417	427	453	452	423	404	382	356	356	344
Finished product and others§	71	81	96	113	117	140	132	136	119	114
Total natural-gas liquids	1,704	1,715	1,693	1,660	1,575	1,504	1,409	1,284	1,181	1,128
Liquefied refinery gas¶	352	332	331	319	313	323	306	291	293	291
Ethane (from refineries)	25	25	25	26	25					
Total all products	2,081	2,072	2,049	2,005	1,913	1,827	1,715	1,575	1,474	1,419

*Eight months actual, four months estimated. ‡Includes isopentane. §Includes plant condensate. ¶LRG figures, 1968 and earlier, include ethane. ethane.

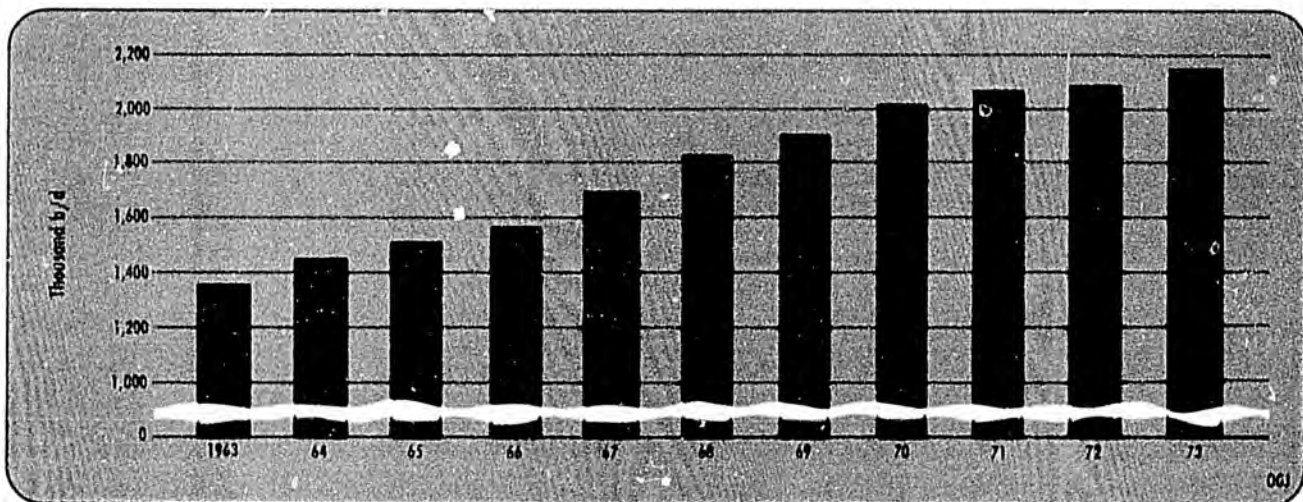
Ethane production rising



Total propane supply



Total production of NGL and LRG



Here's where the big reserves are in U.S.

MOST of the crude-oil production in the U.S. comes from the nation's giant oil fields. These fields lie in many states with Texas holding the most. California and Louisiana are also great storehouses of oil. Alaska's Prudhoe Bay field, not yet on production, is one of the largest with reserves pegged at from 10 to 20 billion bbl or more.

In order to be on this select list of U.S. oil fields, a pool must have an ultimate reserve of 100,000,000 bbl or more. Many of the fields on the listing are of 1920-1930 vintage, the age of oil giants in the U.S. Some of these fields are still producing respectable amounts of oil each year.

One of the newest fields on the list is in Florida at Jay. This is the largest of the Smackover fields in the Southeast. Its discovery set off one of the greatest wildcat campaigns in recent years.

Figures are in thousands of barrels. Only crude oil is figured into this reserve tabulation.

Field	1973 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
ALABAMA				
Citronelle	5,852	107,256	42,743	413
ALASKA				
Granite Point	4,766	51,897	38,554	25
McArthur River	39,171	214,485	175,939	52
Middle Ground Shoal	10,259	78,682	106,033	36
Prudhoe Bay	857	4,406	*	2
Swanson River	10,059	144,551	60,938	37
Trading Bay	7,830	48,902	25,505	42
*Reserves estimates range from 10 to 20 billion bbl.				
APPALACHIAN				
Alleghany	400	166,000	1,815	2,100
Bradford	2,400	656,095	12,374	17,300
ARKANSAS				
Magnolia	520	152,424	7,576	56
Schuler and East	603	105,123	4,877	107
Smackover	2,850	505,647	24,353	2,586
Walker Creek	2,883	7,983	100,477	39

GIANT oil field, produces most of the crude oil in the United States.

Field	1973 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
CALIFORNIA				
SAN JOAQUIN VALLEY				
Belridge South	8,558	186,258	73,526	2,265
Buena Vista	4,389	613,242	36,430	1,127
Coalinga	7,062	626,495	72,370	2,143
Coalinga Nose	3,583	428,980	34,463	77
Coles Levee North	994	139,274	13,984	120
Cuyama South	1,611	207,130	12,473	138
Cymric	3,279	128,573	27,324	719
Edison	1,160	112,128	8,728	472
Elk Hills	797	283,022	1,019,421	104
Fruitvale	981	100,794	6,234	335
Greeley	720	107,472	2,794	43
Kern Front	2,937	131,456	30,530	871
Kettleman North Dome	749	451,466	4,399	136
Kern River	27,973	607,784	469,288	4,370
Lost Hills	2,249	116,931	18,942	1,123
McKittrick—Main Area	5,343	155,196	42,427	646
Midway Sunset	34,699	1,192,592	413,111	5,711
Mount Poso	2,362	165,846	20,620	477
Rio Bravo	271	112,968	1,901	37

COASTAL AREA

Carpinteria Offshore	3,783	41,456	31,055	122
Cat Canyon*	6,760	208,828	44,120	626
Dos Cuadras	16,745	87,498	88,237	129
Elwood	54	103,221	519	12
Orcutt	1,965	147,009	14,811	179
Rincon	4,010	120,256	23,528	321
San Ardo	12,609	261,332	86,636	887
Santa Ynez**				
Santa Maria Valley	3,475	155,791	30,170	197
South Mountain	1,784	128,973	17,782	432
Ventura	11,022	782,054	69,946	804

*Combines Cat Canyon West and Cat Canyon East.

**Undeveloped fields, Santa Barbara Channel, uncorroborated reserves—1-3 billion bbl.

LOS ANGELES BASIN

Belmont Offshore	2,207	36,671	25,664	76
Beverly Hills	5,619	73,811	36,040	127
Brea Olinda	3,685	340,212	27,600	711
Coyote East	680	97,454	5,015	173
Coyote West	2,122	229,979	20,504	159
Dominquez	1,328	257,165	11,272	133
Huntington Beach	20,389	904,585	131,792	1,132
Inglewood	3,552	293,055	23,735	437
Long Beach	2,705	875,609	23,203	766
Montebello	612	183,927	5,678	168
Richfield	1,547	163,370	17,848	263
Santa Fe Springs	823	599,958	11,971	226
Seal Beach	1,339	186,743	8,086	179
Torrance	2,646	179,632	20,338	368
Wilmington	67,066	1,549,496	763,317	2,311

COLORADO

Rangely	19,378	491,337	108,663	387
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FLORIDA

Jay	27,977	42,217	270,783	78
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ILLINOIS

Clay City	3,126	305,224	19,776	2,335
Dale	458	100,014	4,986	636
Loudon	2,965	360,860	24,140	1,429
New Harmony	1,558	153,975	16,025	1,130
Salem	2,904	352,990	17,010	1,389

KANSAS

Bemis-Shutts	2,149	216,475	18,525	941
Chase-Silica	1,272	249,244	10,756	1,058
Eldorado	1,204	278,847	11,153	795
Hall-Gurney	2,071	125,423	14,577	1,202

Field	1973 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
Kraft-Prusa	917	116,958	8,042	602
Trapp	1,466	205,691	14,309	989

LOUISIANA, ONSHORE

Avery Island	1,839	77,556	32,444	31
Bay DeChene	6,590	69,351	40,649	76
Bay St. Elaine	6,254	138,602	51,298	92
Bayou Sale	2,816	142,348	32,652	93
Black Bay West	8,036	84,470	65,530	153
Caillou Island	25,613	498,875	201,125	375
Cote Blanche Island	5,482	72,014	57,986	46
Delta Farms	997	109,137	10,863	47
Garden Island Bay	10,384	166,426	89,911	255
Golden Meadow	2,027	113,043	21,957	238
Grand Bay	5,755	148,599	56,401	176
Hackberry East	1,647	91,739	18,261	78
Hackberry West	3,100	114,952	25,048	139
Iowa	1,244	91,113	8,887	40
Jennings	261	111,409	3,591	72
Lafitte	8,211	206,805	51,190	246
Lake Barre	5,420	166,019	53,981	169
Lake Pelto	4,069	97,637	37,363	61
Lake Salvador	2,432	73,810	36,190	84
Lake Washington	6,965	192,186	82,814	139
Leeville	3,156	122,807	27,193	88
Paradis	4,277	99,156	20,188	93
Quarantine Bay	3,946	146,125	38,875	121
Romere Pass	2,727	78,129	26,871	43
Timbalier Bay	9,456	226,634	200,111	239
Venice	5,078	153,785	51,215	124
Vinton	3,478	119,892	20,108	178
Weeks Island	9,486	193,729	96,271	86
West Bay	8,363	169,864	70,136	222
W. Cote Blanche Bay	10,288	139,436	110,564	280

LOUISIANA, NORTH

Caddo-Pine Island	3,076	309,666	30,334	8,056
Delhi	6,290	159,373	50,627	118
Haynesville (Ark. La.)	1,788	170,230	14,770	191
Rodessa (La. Tex.)	329	175,123	4,877	150

LOUISIANA, OFFSHORE

Bay Marchand Blk. 2 (Incl. onshore)	32,561	396,902	253,098	290
Eugene Island Blk. 126	4,663	84,778	40,222	54
Eugene Island Blk. 175	9,873	29,241	80,759	80
Eugene Island Blk. 276	6,322	42,082	122,918	65
Grand Isle Blk. 16	18,936	197,896	152,104	85
Grand Isle Blk. 43	20,732	142,670	227,402	222
Grand Isle Blk. 47	4,684	61,097	38,903	80
Main Pass Blk. 35	2,456	77,613	22,387	86
Main Pass Blk. 41	14,808	134,123	145,877	121
Main Pass Blk. 69	10,924	183,037	76,963	160
Main Pass Blk. 306	6,652	26,369	123,631	125
Ship Shoal Blk. 204	5,369	21,408	83,592	63
Ship Shoal Blk. 207	6,904	38,196	136,804	51
Ship Shoal Blk. 208	11,262	81,947	143,053	83
South Marsh Island Blk. 73	5,353	35,828	69,172	44
South Pass Blk. 24 (Incl. onshore)	16,740	356,253	133,747	428
South Pass Blk. 27	13,366	247,358	137,642	341
South Pass Blk. 62	8,666	41,956	148,044	68
South Pass Blk. 65	12,088	36,088	153,912	70
West Delta Blk. 30	24,626	289,876	160,124	226
West Delta Blk. 58	8,176	28,056	121,944	76
West Delta Blk. 73	9,348	120,565	154,435	102

MISSISSIPPI

Baxterville	7,902	160,160	74,840	234
Heidelberg	5,417	110,190	39,810	263
Tinsley	3,122	193,474	26,526	203

MONTANA

Bell Creek	7,967	58,912	51,088	250
Cut Bank	4,289	135,173	33,827	873
Pine	2,830	77,000	30,500	107

Field	1973 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
NEW MEXICO				
Caprock and East	620	92,326	7,674	621
Denton	1,840	123,114	16,886	196
Empire Abo	9,797	98,904	71,096	253
Eunice	4,501	122,136	18,864	1,103
Hobbs	5,159	216,729	37,954	437
Maljamar	6,821	98,251	66,749	809
Monument	295	210,025	29,975	106
Vacuum	4,216	261,834	138,166	1,168

NORTH DAKOTA

Beaver Lodge	2,985	75,377	24,623	144
Tioga	1,135	69,567	30,433	215

OKLAHOMA

Allen	2,645	124,381	15,619	1,495
Avant	410	106,242	2,758	625
Bowlegs	1,750	156,827	8,173	180
Burbank	3,870	500,354	40,646	1,075
Cement	2,470	138,956	16,044	1,475
Cushing	3,245	460,217	24,783	1,715
Earlsboro	460	215,804	4,196	190
Edmond West	715	154,522	5,478	455
Eola-Robberson	4,355	104,257	35,743	485
Fitts	2,180	148,303	11,692	610
Glenn Pool	2,150	307,441	12,559	1,015
Golden Trend	9,875	393,876	106,124	1,235
Healdton	6,880	286,665	33,335	1,520
Hewitt	6,880	212,391	37,609	1,180
Little River	365	159,571	5,429	170
Oklahoma City	1,860	731,896	18,104	280
Seminole Greater	1,190	198,446	11,554	260
Sho-Vel-Tum	33,320	968,206	181,794	8,025
Sooner Trend	11,480	189,604	60,396	2,920
St. Louis	1,185	215,045	9,955	635
Tonkawa	275	134,937	2,063	200

TEXAS

DISTRICT 1				
Big Wells	5,977	22,638	127,362	260
Darst Creek	2,050	139,653	20,347	837
Luling-Branyon	1,455	145,817	14,183	1,309

DISTRICT 2				
Greta All	4,598	112,475	47,525	184
Refugio All	337	94,846	5,154	66
Tom O'Connor	27,895	470,743	229,257	978

DISTRICT 3				
Anahuac	10,969	234,810	115,190	233
Barbers Hill	681	124,032	10,968	98
Conroe	21,846	518,922	156,078	581
Dickson-Gillock	1,935	106,114	43,886	79
Goose Creek & East	861	129,989	10,011	255
Hastings E&W	22,546	475,079	199,921	448
High Island All	1,499	129,655	20,345	103
Hull-Merchant	1,404	192,388	12,612	369
Humble All	1,362	160,366	29,634	377
Magnet Withers All	3,143	77,906	47,094	290
Old Ocean	879	120,730	9,270	38
Raccoon Bend	2,485	89,719	35,281	134
Sour Lake	890	116,461	8,539	286
Spindletop	181	153,570	3,430	94
Thompson All	15,858	353,752	146,248	279
Tomball	3,342	100,715	29,285	225
Webster	20,894	388,196	186,804	149
West Columbia	1,089	156,496	13,504	191

DISTRICT 4				
Aqua Dulce-Stratton	3,030	135,878	34,122	262
Borregas All	2,264	106,221	28,779	182
Kelsey All	3,040	105,393	44,607	180
Plymouth	756	115,916	9,084	101
Seeligson All	3,837	260,750	64,252	417
Tijerina-Canales-Blucher	7,094	96,661	68,339	135
White Point East	1,048	98,772	11,228	159

DISTRICT 5				
Mexia	130	107,224	2,776	98
Powell	95	129,971	1,029	31

Field	1973 prod.	1,000 bbl Cum. prod.	Est. reserves	Est. No. wells
Van and Van Shallow	16,658	403,120	146,880	467
DISTRICT 6				
East Texas	75,436	4,169,403	1,830,597	13,638
Fairway	17,175	109,962	89,975	97
Hawkins	39,513	496,067	328,933	449
Neches	4,889	55,313	44,687	129
Quitman All	3,812	76,845	32,829	242
Talco	4,138			598

DISTRICT 7-C				
Big Lake	544	124,164	10,836	94
McCamey	858	123,295	6,705	889
Pegasus	2,962	110,440	29,560	178

DISTRICT 8				
Andector	6,990	121,499	63,501	103
Block 31	5,262	137,594	52,406	111
Cowden North	13,091	261,866	63,134	964
Cowden South, Foster, Johnson	16,075	282,899	117,101	1,269
Dollarhide	5,840	144,362	65,638	152
Dune	9,181	119,028	80,972	886
Emma and Triple N.	2,483	94,701	20,299	279
Fuhrman-Mascho	1,806	72,952	27,048	597
Fullerton All	6,642	231,661	68,339	597
Goldsmith All	19,298	561,227	113,773	2,790
Hedrick	638	251,561	3,439	172
Howard Glasscock	6,761	303,251	71,749	1,872
Iatan East	3,896	82,215	42,785	837
Jordan	3,222	98,998	31,002	343
Kermit	1,121	111,440	18,560	468
Keystone	5,328	267,801	52,199	786
McElroy	10,772	297,698	62,302	1,848
Means All	7,677	139,605	70,395	376
Midland Farms All	6,658	169,643	55,357	314
Penwell	1,705	83,482	16,518	512
Sand Hills	5,841	184,013	60,987	1,045
Shafter Lake	2,689	69,708	30,292	440
TXL All	4,061	232,686	32,314	774
Waddell	3,477	78,817	31,183	406
Ward South	577	96,097	3,903	453
Ward Estes North	7,520	304,004	70,996	1,957
Yates	18,195	587,252	1,012,748	581

DISTRICT 8-A				
Anton	5,164	70,911	39,089	152
Cogdell Area	12,255	177,681	142,319	386
Diamond M	7,547	190,164	84,836	460
Kelly-Snyder	70,944	540,039	568,073	641
Levelland	11,201	220,117	104,883	1,624
Prentice	5,913	87,914	52,086	306
Russell All	2,998	109,344	25,656	237
Salt Creek	12,014	113,570	116,430	116
Seminole All	15,475	199,245	115,755	214
Slaughter	45,486	548,432	241,568	2,530
Spraberry Trend	20,383	361,443	148,557	3,524
Wasson All	83,726	616,311	716,237	2,281
Welch	6,505	82,371	67,629	378

DISTRICT 9				
KMA	2,327	165,325	19,675	966
Walnut Bend	5,286	96,434	43,566	262

DISTRICT 10				
Panhandle	12,579	1,271,238	143,762	10,503

UTAH

Greater Altamont	13,069	24,367	250,333	133
Greater Aneth	7,814	251,515	63,485	364
Greater Red Wash	3,924	90,095	49,905	226

WYOMING

Elk Basin (Mont.-Wyo.)	9,559	461,354	78,646	190
Garland	2,692	105,696	29,304	202
Grass Creek	3,124	137,631	27,369	233
Hamilton Dome	3,319	175,019	39,981	87
Hilight	7,896	42,090	92,910	190
Lance Creek	227	104,293	2,707	38
Lost Soldier	3,775	137,916	27,084	62
Oregon Basin	11,392	228,995	61,005	300
Salt Creek	15,203	529,603	65,397	976

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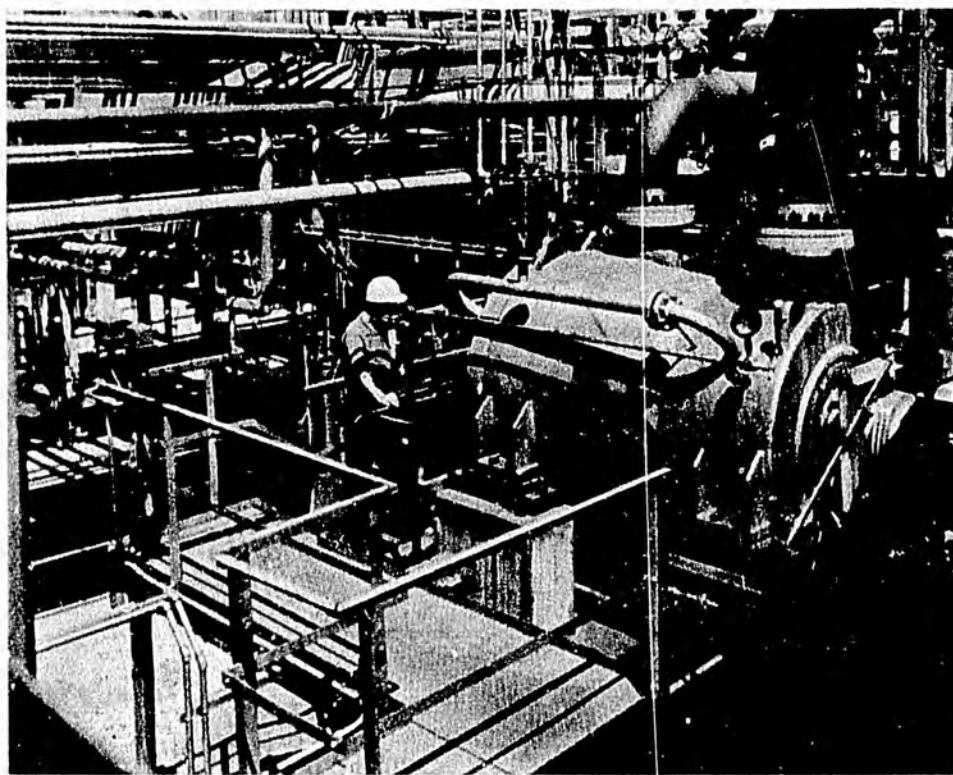
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Another big drop logged for U.S. oil and

PROVED reserves of oil and natural gas in the U.S. plunged again last year.

The surge in drilling hasn't yet been translated into reserve additions on a scale capable of offsetting the heavy withdrawals from record or near-record production rates. But the upturn in activity last year may have helped slow the rate of decline in liquids.

New reserve estimates did not take into account late-year increases

in crude prices.

The reserves committees of the American Petroleum Institute and American Gas Association reported these figures as of Jan. 1, 1974:

- Crude oil—down 1.040 billion bbl to 35.3 billion, after subtracting net production of 3.185 billion bbl, including 390 million from the Gulf of Mexico. About 80% of the decline was accounted for by Texas and Louisiana. API reported 5.144 billion bbl of indi-

cated additional reserves on top of those listed in the proved category.

- Natural-gas liquids—down 332 million bbl to 6.455 billion, after production of 741 million bbl.

- Total liquid hydrocarbons—down 1.4 billion bbl to 41.755 billion, compared with a 2.2-billion decline the year before.

- Natural gas—down 16.1 trillion cu ft to 250 trillion, marking the fifth decline in the last 6 years and the larg-

Breakout by state of crude-oil and natural-gas reserves in the United States

State or area of state	Proved reserves Jan. 1, 1973	Changes due to revisions	Changes due to extensions	CRUDE OIL (thousand bbl)		Production in 1973*	Proved reserves Jan. 1, 1974
				New field discoveries	New pools in old fields		
Alabama	56,734	+ 653	5,400	1,776		10,960	53,603
Alaska	10,096,282	+ 85,754		1,500	1,000	72,323	10,112,213
Arkansas	113,100	+ 5,898	3,540	60	75	17,121	105,552
California†	3,553,735	+ 217,566	16,740	30,000	5,800	335,741	3,488,100
Coastal region	513,322	+ 88,124	14,050		5,550	76,762	536,284
Los Angeles Basin	1,282,048	+ 48,034				132,214	1,197,868
San Joaquin Basin	1,758,365	+ 89,408	2,690	30,000	250	126,765	1,753,948
Colorado	326,411	+ 4,474	7,174	3,496	99	36,864	304,790
Florida	208,149	+ 2,449	5,697	160		32,596	183,859
Illinois	174,883	+ 3,697	1,375	1,257	238	29,107	152,343
Indiana	29,384	+ 1,204	625	292	516	5,398	26,622
Kansas	453,394	+ 6,254	5,565	2,459	5	66,588	401,089
Kentucky	48,193	- 6	325	15	275	8,822	32,980
Louisiana†	5,028,478	+ 63,206	118,853	31,900	54,112	719,723	4,576,826
North	281,451	+ 6,277	620	103		36,063	252,388
South	4,747,027	+ 56,929	118,233	31,797	54,112	683,660	4,324,438
Michigan	62,002	+ 7,129	10,000	7,035		13,722	72,444
Mississippi	312,458	+ 26,035	3,235	2,422	410	53,511	291,049
Montana	241,248	+ 11,031	650	930		34,516	219,343
Nebraska	30,553	+ 3,820	1,068	61		7,336	28,166
New Mexico	582,593	+ 152,852	2,687	322	754	96,214	642,994
Northwest	24,246	+ 4,716		36		5,138	23,860
Southeast	558,347	+ 148,136	2,687	286	754	91,076	619,134
New York	9,246					958	8,288
North Dakota	166,033	+ 24,754	8,470	5		19,742	179,520
Ohio	127,385		6,275		44	8,793	124,911
Oklahoma	1,303,004	+ 130,704	15,584	1,251		179,579	1,270,964
Pennsylvania	37,345	+ 5,550				3,282	39,613
Texas†	12,144,057	+ 723,449	106,682	17,825	22,904	1,258,304	11,756,613
Dist. 1	147,324	+ 13,876	2,966	253	100	20,370	144,149
Dist. 2	636,768	+ 108,159	1,519	763	4,226	74,310	677,125
Dist. 3	1,536,426	+ 104,304	12,777	1,907	3,878	169,864	1,489,428
Dist. 4	343,752	- 2,839	6,073	95	8,921	51,580	304,422
Dist. 5	98,963	+ 47,150		300	2	20,583	126,462
Dist. 6	2,208,438	+ 175	3,554	220	101	163,240	2,049,248
Dist. 7-B	235,962	+ 18,450	13,724	2,513	720	35,499	235,870
Dist. 7-C	239,270	- 22,021	16,317	5,017	161	33,748	204,996
Dist. 8	3,402,358	+ 47,514	30,060	940	1,449	276,783	3,205,538
Dist. 8-A	2,793,503	+ 323,173	9,579	2,804	2,056	345,807	2,785,308
Dist. 9	324,018	+ 72,628	9,333	2,655	1,045	45,971	363,708
Dist. 10	177,275	+ 12,250	780	358	245	20,549	170,359
Utah	244,397	+ 5,094	47,000	60	65	32,104	264,512
Virginia							
West Virginia	34,040		530		15	2,459	32,126
Wyoming	949,779	+ 68,641	22,501	12,646	1,404	138,208	916,763
Miscellaneous‡	6,526	+ 1,569	165	625	100	1,429	7,556
Total U.S.	36,339,408	+ 1,551,777	390,141	116,097	87,816	3,185,400	35,299,839

*Estimate. †Economically available by fluid injection. Additional reserves from fluid injection whether injection is under way or not. ‡Includes gas category) Arizona, Iowa, Maryland, Minnesota, Missouri, South Dakota, Tennessee, Washington.

gas reserves

est on record. It would have been the sixth consecutive year of falling reserves except for the first-time inclusion of 26 trillion cu ft of newly discovered gas on Alaska's North Slope in 1970. Gross additions to reserves, including net changes in underground storage in 1973, amounted to only 6.5 trillion cu ft.

• Productive capacity of crude oil—down 600,000 b/d to 9.7 million b/d, for the sixth consecutive decrease

since API began estimating such figures in 1967. Productive capacity is the estimated amount of crude that can be produced on leases within 90 days from Dec. 31, 1973, with existing wells and surface equipment or with changes in production facilities that could be made in that period.

Officials of API and AGA stressed the need for access to new offshore acreage and price incentives to spur drilling and halt the slide in reserves. They also warned against punitive tax legislation which would frustrate efforts to get capital to bring forth new supplies.

Crude oil. Louisiana led the big drop in reserves with 452 million bbl, of which 423 million was in the southern section, including offshore.

Gulf of Mexico reserves, including both Texas and Louisiana, fell 218 million bbl to 2.3 billion.

Texas followed closely with a decline of 387 million bbl, concentrated in Dist. 6 and Dist. 8. Other major oil states also were down.

Modest increases were recorded by New Mexico, 60 million bbl; Alaska, 16 million; North Dakota, 13 million; Michigan, 10 million; and Pennsylvania, 2 million.

Changes from Jan. 1, 1973	Indicated total reserves†	NATURAL GAS (MMcf)				Proved reserves Jan. 1, 1974	Change from Jan. 1, 1973
		Proved reserves Jan. 1, 1973	Extensions and revisions	New fields and new pools	Production in 1973*		
- 3,131	22,041	245,714	+ 83,553	6,000	7,892	327,375	+ 81,661
+ 15,931	36,000	31,455,553	+ 317,398	600	130,815	31,642,636	+ 187,083
- 7,548	21,444	2,455,877	- 25,727	2,050	163,586	2,269,353	- 186,524
- 65,635	1,560,150	5,328,862	+ 242,582	110,850	478,356	5,199,837	- 129,025
+ 22,962	202,750	761,580	- 15,679	500	70,361	684,922	- 76,658
- 84,180	418,000	493,340	- 2,752		51,276	479,008	- 54,332
- 4,417	939,400	4,073,942	+ 255,509	110,350	356,719	4,075,907	+ 1,965
- 21,621	93,790	1,655,200	+ 317,401	27,914	134,276	1,868,299	+ 213,099
- 24,290	161,203	180,629	+ 1,945		33,660	148,914	- 31,715
- 22,540	6,500	545,361	+ 1,978		2,840	380,525	- 164,836
- 2,761	2,800	87,234	+ 509		1,364	66,682	- 20,552
- 52,035	1,500	11,938,716	+ 635,328	31,124	899,460	11,722,395	- 216,321
- 8,213	3,000	938,082	+ 17,604	3,610	62,396	864,921	- 73,161
- 451,652	233,877	74,971,334	+ 842,398	1,788,930	8,457,596	69,151,613	- 5,819,721
- 29,063	31,645	3,320,328	+ 37,477	24,454	412,431	2,976,133	- 344,195
- 422,589	202,232	71,651,006	+ 804,921	1,764,476	8,045,165	66,175,480	- 5,475,526
+ 10,442	7,500	1,296,815	+ 41,297	250,938	47,842	1,548,508	+ 251,693
- 21,409	22,952	1,104,336	+ 143,655	38,432	96,657	1,178,218	+ 73,882
- 21,905	51,420	1,064,036	+ 37,346	46,713	60,209	1,092,449	+ 28,413
- 2,387	4,145	50,260	+ 2,547	17	4,446	48,816	- 1,444
+ 60,401	319,510	12,335,647	+ 1,254,707	76,414	1,194,706	12,488,363	+ 152,716
- 386	4,025	8,160,874	+ 382,867	58	559,448	7,985,386	- 175,488
+ 60,787	315,485	4,174,773	+ 871,840	76,356	635,258	4,502,977	+ 328,204
- 958	2,000	139,184	+ 4,725		4,283	136,842	- 2,342
+ 13,487	14,670	441,625	+ 43,648	10	37,099	448,184	+ 6,559
- 2,474		1,146,677	+ 163,475	19,544	89,527	1,179,391	+ 32,714
- 32,040	261,000	14,492,030	+ 1,239,156	135,332	1,777,787	14,098,735	- 393,295
+ 2,268	54,770	1,406,948	+ 153,275	14,100	78,514	1,494,381	+ 87,433
- 387,444	2,083,344	95,042,043	- 3,209,546	1,345,655	8,240,478	84,936,502	- 10,105,541
- 3,175	36,702	1,620,405	- 28,772	21,352	139,715	1,473,201	- 147,204
+ 40,357	5,720	9,496,136	- 643,178	111,881	514,668	8,449,920	- 1,046,216
- 46,998	31,928	20,696,874	- 1,029,612	443,273	1,580,960	18,526,171	- 2,170,703
- 39,330	36,865	24,334,110	- 3,562,955	259,006	1,613,946	19,416,215	- 4,917,895
+ 27,499	36,000	1,171,395	+ 82,147	4,330	112,308	1,149,781	- 21,614
- 159,190	199,055	5,710,441	- 7,515	38,832	309,565	5,432,193	- 278,248
- 92	10,500	663,560	+ 64,225	6,235	79,090	652,076	- 11,484
- 34,274	9,028	2,581,980	+ 96,214	19,008	266,608	2,430,873	- 151,107
- 196,820	1,016,630	15,481,337	+ 988,512	337,009	2,010,404	14,796,454	- 684,883
- 8,195	686,861	2,366,951	- 13,449	1,140	233,137	2,121,505	- 245,446
+ 39,690	10,555	1,559,594	+ 82,591	2,563	143,465	1,502,193	- 57,401
- 6,916	3,500	9,359,260	+ 762,246	101,026	1,236,612	8,985,920	- 373,340
+ 20,115	44,100	1,022,110	+ 41,154	12,505	51,029	1,024,723	+ 2,613
- 1,914	5,000	35,921	+ 6,300	100	5,048	37,273	+ 1,352
- 33,016	131,644	2,345,957	+ 148,454	13,849	168,023	2,319,828	- 26,129
+ 1,030		4,088,728	+ 200,263	196,908	376,753	4,109,523	+ 20,795
		269,987	- 2,895	924	759	165,931	- 104,056
- 1,039,569	5,144,760	266,084,866	+ 2,702,530	4,122,519	22,605,406	249,950,217	- 16,134,649

offshore reserves. †Includes (under crude-oil category) Arizona, Missouri, Nevada, South Dakota, Tennessee, and Virginia. Includes (under natural-

Gas-liquids reserves (1,000 bbl)

State or area of state	Reserves Jan. 1, 1973	Production in 1973*	Proved reserves Jan. 1, 1974	Change from Jan. 1, 1973
Alabama	27,606	711	44,592	+ 16,986
Alaska	442	99	343	- 99
Arkansas	7,778	1,123	5,044	- 2,734
California†	126,726	12,461	105,963	- 20,763
San Joaquin Basin	67,174	6,650	60,170	- 7,004
Coastal Region†	29,668	3,366	25,216	- 4,452
Los Angeles Basin†	29,884	2,445	20,577	- 9,307
Colorado	16,079	2,767	20,853	+ 4,774
Florida	8,800	334	3,307	- 5,493
Illinois	814	0	0	- 814
Indiana	14	0	0	- 14
Kansas	393,082	30,602	387,298	- 5,784
Kentucky	46,782	3,085	45,324	- 1,458
Louisiana†	2,135,837	246,920	1,992,537	-143,300
North	107,282	16,020	86,824	- 20,458
South†	2,028,555	230,900	1,905,713	-122,842
Michigan	19,026	1,483	25,046	+ 6,020
Mississippi	14,620	1,499	14,090	- 530
Montana	4,413	691	3,625	- 788
Nebraska	1,630	351	1,292	- 338
New Mexico	502,787	38,306	413,180	- 89,607
Northwest	270,913	16,086	255,498	- 15,415
South	231,874	22,220	157,682	- 74,192
North Dakota	45,367	2,022	53,345	+ 7,978
Ohio	0	0	0	0
Oklahoma	335,161	40,100	289,102	- 46,059
Pennsylvania	735	76	659	- 76
Texas†	2,891,583	337,944	2,830,143	- 61,440
Dist. 1	16,742	3,143	26,510	+ 9,768
Dist. 2	122,029	11,157	144,318	+ 22,289
Dist. 3†	570,324	53,637	464,794	-105,530
Dist. 4†	424,019	60,340	490,561	+ 66,542
Dist. 5	73,358	6,057	73,261	- 97
Dist. 6	384,345	28,378	355,689	- 28,656
Dist. 7-B	52,921	8,947	62,161	+ 9,240
Dist. 7-C	118,506	16,767	120,608	+ 2,102
Dist. 8	475,338	60,177	453,718	- 21,620
Dist. 8-A	258,147	39,046	264,731	+ 6,584
Dist. 9	68,280	9,450	78,462	+ 10,182
Dist. 10	327,574	40,905	295,330	- 32,244
Utah	34,002	2,385	52,544	+ 18,542
West Virginia	82,084	5,651	82,755	+ 671
Wyoming	91,191	12,221	83,665	- 7,526
Total United States	6,786,559	740,831	6,454,707	-331,852

*Preliminary net production. †Includes offshore reserves.

It was another poor discovery year, with only 116 million bbl added from new field discoveries and 88 million from new pools. The reserves committee added 2.2 billion bbl to gross reserves by upward revisions of previous figures, deducted 662 million via downward revisions, and added 390 million bbl from extensions of known fields.

The only new discoveries of consequence showing up in addition to reserves were in Louisiana, with 31 million bbl, mostly offshore, and California, in the San Joaquin Basin, 30 million bbl, probably due to Tule Elk field.

Natural gas. The record slide left proved reserves, counting the shut-in

Prudhoe Bay field in Alaska, at the lowest level since 1957.

In the Lower 48 states, reserves were down to 218.3 trillion, the lowest since 1954, when, AGA noted, gas consumption was less than half of what it is now.

The downward trend was general among major producing states. Reserves in Texas were down to 84.9 trillion cu ft from 95 trillion, Louisiana to 69.2 trillion from 75, Oklahoma to 14.1 trillion from 14.5 trillion, and Kansas to 11.7 trillion from 11.9 trillion. Alaska and New Mexico showed small increases in proved reserves.

Negative revisions of prior reserves estimates cut sharply into the total in both Texas and Louisiana. Texas

was revised downward 4.7 trillion, due mainly to new estimates for Dist. 3 and 4 on the Gulf Coast. Louisiana's negative revisions amounted to 609 billion cu ft, almost all in the southern part of the state, including offshore.

These adjustments were based primarily on data obtained from continuing production experience, AGA explained. Data indicate a greater loss of pressure with production than had been expected.

AGA included statistics separately for the first time for reserves and production off Texas and Louisiana. Last year the region produced 4.2 trillion cu ft, or 18.4%. Proved reserves in the gulf are estimated at 36.8 trillion cu ft, down 2-trillion for the year.

Canadian reserves slump. The Canadian Petroleum Association reported proved reserves of marketable gas in Canada at the end of 1973 were down by half a trillion to 52.5 trillion cu ft.

CPA hasn't included any reserves in the Mackenzie Delta, the Arctic Islands, or the East Coast offshore areas, since details of these strikes haven't been made available to the association.

Estimates for the Mackenzie Delta will become available through the National Energy Board in connection with the application of Canadian Gas Arctic Pipeline for a line from Alaska via Mackenzie Valley to the U.S.

Productive capacity. API noted that the productive capacity estimate indicates an excess of 1 million b/d over December production of 8.7 million.

It explained that the capacity figure is one that could be achieved within 90 days "under conditions of an extreme national emergency." Most of the difference is located in 14 fields, API said, with three fields making up 80% of the total. In one of these fields, which is producing at the maximum legal rate, use of incremental capacity would create equity problems concerning mineral rights, API said.

Also, it added, there would be considerable waste of natural gas because of gas production exceeding gas-processing capacity. In the case of another field, also producing at the "maximum achievable legal rate," use of the incremental capacity would create equity problems also. In an extreme emergency, API assumes that these problems could be resolved in 90 days. The third field referred to is the Elk Hills Naval Petroleum Re-

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WORLDWIDE ISSUE

1972: Year of the Arab

Frank J. Gardner
International Editor



CONSTRUCTION of pipeline and production facilities has picked up in Saudi Arabia as nation pushes for new highs in oil output.

CALL it hectic, call it turbulent; call it what you will, 1972 was the Year of the Arab.

Flexing the muscles he'd developed in 1971, he spent all 12 months of the year just closed in pursuing new advantages, and with outstanding success.

In January, the Arab nations and Iran—the Persian Gulf circle—nalled down an 8.49% increase in the prices of their crudes to compensate for loss of purchasing power stemming from devaluation of several of the world currencies, chiefly the U.S. dollar.

The settlement, reached in Geneva under the sponsorship of the Organization of Petroleum Exporting Countries

(OPEC), tacked an average 19¢/bbl on the prices for Persian Gulf crudes.

With that done, the Arab states turned immediately to the next OPEC goal—participation by host governments in the oil-company operations. Before adjourning the Jan. 20 conference, OPEC members designated Saudi Arabian Oil Minister Ahmed Zaki Yamani as their top negotiator in the search for participation.

Yamani was the logical choice, of course, for the participation concept had been his principal preoccupation since 1968. And he spent almost all of 1972 in pursuing the goal.

He got off to a slow start. At first he confined his efforts to his own country's principal concessionaire—Arabian American Oil Co. (Aramco). But Aramco refused to budge from its antiparticipation stance, even after a stern warning from Saudi King Faisal.

At the time, Yamani declared, "The attitude of the oil companies forces us to think in terms of battle rather than negotiations."

He approached the Mar. 11 OPEC special session in Beirut without much hope of avoiding an angry showdown between the Arabs and the oil companies.

But suddenly, on Mar. 10, a day before the meeting, Aramco dispatched a letter to Yamani, saying that it accepted "the principle" of participation and that "having accepted the principle, the company considers it in order, as suggested by the government, to proceed with negotiations."

That letter launched 7 months of arduous negotiations between Yamani and all the oil companies bordering the western shores of the gulf. Iran had disassociated itself from the participation talks on June 24 when the shah declared himself "uninterested."

Finally, on Oct. 5, the so-called "New York agreement" was announced, and Yamani had won his long battle.

The pact held some surprises, principally in a provision for initial participation of 25% by the host states, rather than the expected 20%. It further provided for escalation to 51% participation by 1983.

The Arab side had made some concessions to the companies, too. Among these was compensation on the basis of "updated book value," taking into consideration the effects of inflation over the years, and investments made



INDIA conducted a running feud with her foreign oil refiners throughout 1972, as it sought solutions to the rising price of crude and soaring product demand. Here, a Caltex kerosine delivery in Bombay.

during the period from discovery to date.

As the year draws to a close, the Arabs can claim a major victory in their struggle to take control of their oil. And they owe that victory to one man—Ahmed Zaki Yamani.

Iraq seizes IPC. Another major Arab event of 1972 was Iraq's sudden move on June 1 to nationalize the fields and properties of Iraq Petroleum Co. (IPC) in the northern part of the country. On May 17, the Iraqi Revolutionary Command Council (RCC) had issued an ultimatum to IPC to boost the sagging output from the northern fields by May 31 or face legislative action.

At the time, the northern fields were producing at only half the volume they had been earlier in the year. Iraq declared it was a pressure tactic by the company on the government, while the company retorted that the oil was simply overpriced in view of reduced tanker rates and slackened European oil demand.

As the deadline passed, Iraqi President Ahman Hasan al-Bakr declared the northern field nationalized. At the time, the Arab Oil Congress was gathered in Algiers, and the Iraqi an-

nouncement triggered rousing Arab shouts of approval.

In the aftermath, Cie. Francaise des Petroles (CFP), a 23.75% partner in IPC, reached agreement with the Iraqis to act as mediator in the negotiations on compensation to the company for the loss of the northern fields. From total shutdown on June 1, the northern fields have gradually built up their output to about 700,000 b/d, with most of it being exported to France, and some to Italy and the Comecon countries and India.

As mediators in the dispute, Iraq accepted CFP director Jean Duroc Danner and Nadim Pachachi, secretary general of OPEC. IPC, for its part, has held off any legal action against Iraq, pending the outcome of the negotiations. But it has declared Jan. 1, 1973, as the deadline for such action.

At the time of the nationalization in Iraq, Syria also declared nationalization of the IPC pipelines and terminals in that country. At press time, the two Arab states continued to bicker over transit fees to be paid the Syrians by Iraq.

Libya sets new terms. In another Arab country, new patterns also were being fashioned in 1972.

Libya, which nationalized British Petroleum's half-share in the giant Sarir field on Dec. 7, 1971, set forth in mid-October to grab 50% of the other half, held by independent Dallas oilman Nelson Bunker Hunt.

Only a fortnight earlier, the Libyans had sealed a 50-50 participation deal with Italy's ENI for operations on its Concession 100-A. With that in hand, they approached Hunt, demanding not only half his share of the field, but that he market the government oil, and hand over half his profits from oil sales retroactive to the date of the BP takeover.

The action foretells a similar campaign by the Libyan authorities against every other oil company in Libya.

Egypt ejects Russians. In yet another Arab state, Egypt, the biggest surprise of the year was political. In mid-July, President Anwar al-Sadat tagged the 5,000 top Russian military men and 10,000-15,000 lesser personnel as persona non grata, and demanded their withdrawal from Egypt.

The presidential action took the entire world by surprise. The move was and still is a puzzle to political ob-

servers. But there are indications that Libya's crafty Col. Muammar al-Qaddafi may have influenced Sadat, in view of his strong anticommunist stand and the proposed merger of the two countries.

Iran springs a surprise. Yet another surprise popped up in non-Arab Iran. At a London press conference on June 24, Shah Mohammad Reza Pahlavi revealed that he would sign three 5-year extensions to the Iranian Consortium's contract to produce oil from the "agreement area."

Only a year earlier, the shah had declared, "It's ridiculous that a foreign oil company should pump our oil from the well to the tanker. We can do this ourselves."

In his turnabout declaration, the shah said, "We have reached a period of close collaboration with the oil companies, which I think is in the interest of both parties."

The original agreement, signed in 1954, was to expire in 1979, but it calls for the three extensions at the option of the oil companies. Under the shah's new plan, it will extend to 1994.

The terms of the new Iranian agreement had not come to light at press time, but as the shah put it, "it will open a new page in the relations of producing countries and the oil companies, which are the intermediary between the producing countries and the consumers."

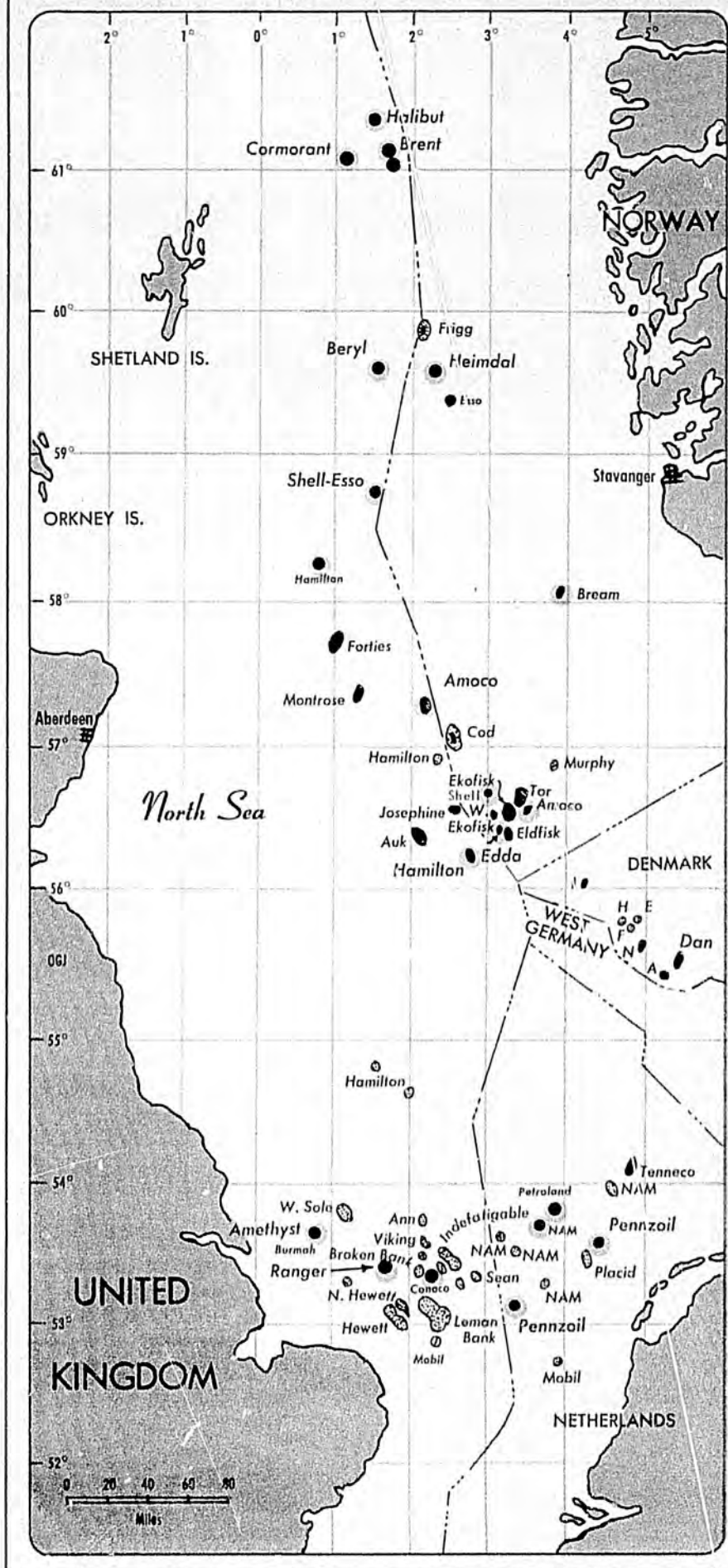
Top story in 1972. In the world of exploration for oil during 1972, the North Sea theater went unchallenged as Story No. 1.

At least 13 new oil fields came to light in the northern part of the sea during the year, and 7 new gas fields in its southern part (see map). Some of the oil finds may prove subcommercial, but the ones that are known already to be commercial are whales indeed.

Perhaps the most sensational and important finds were made in a single block—211—of the British North Sea. Here, within the space of a month (August), the Shell-Esso partnership announced two giant discoveries.

At the beginning of the month, Shell, as operator, announced that its second test of the Brent structure—well 211/29-2—had confirmed the presence of at least 1 billion bbl of recoverable reserves. Actually, the first well—211/29-1—had discovered the field in 1971, but Shell had not revealed this. However, as rumors flew

The North Sea's lucky 13 for 1972



Worldwide oil at a glance

COUNTRY	RESERVES 1-1-73		WFLS		OIL PRODUCTION			REFINING		
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-72	Drilling 12-1-72	Estimated 1972 (1,000 b/d)	% change from 1971	No. refin- eries	Capacity (1,000 b/d) Jan. 1, 1973		
								Crude	Cracking	Reform- ing
ASIA-PACIFIC										
Afghanistan	189,900	5,000	16	5	0.2					
Australia	2,121,460	*36,236	398	6	308.0	- 2.0	10	632.7	144.7	131.6
Bangladesh	8,000						1	30.6		1.6
Brunei-Malaysia	1,500,000	10,000	558	4	276.0	39.0	3	123.2		5.7
Burma	175,000	120	695	7	20.0	15.0	2	25.3	1.6	
Cambodia							1	12.5		1.8
Ceylon							1	37.4	9.0	2.5
Guam							1	29.5		
India	834,000	2,300	1,545	8	151.0	3.0	10	489.1	82.3	21.8
Indonesia	10,005,000	5,500	2,344	17	1,027.0	15.0	8	424.0	49.5	16.0
Japan	23,000	400	1,078	10	15.0	- 1.0	43	4,315.6	264.5	422.2
Korea, South				1			1	430.0	7.5	26.0
New Zealand	224,000	17,000	4	2	2.7	50.0	1	54.0		18.0
Okinawa (R.I.)							3	210.0		10.0
Pakistan	34,500	16,000	17	4	9.5	- 5.0	3	80.5		2.5
Philippines		180		5			4	276.3	25.9	41.9
Singapore							4	390.2		19.4
Taiwan	15,000	500	12	3	2.0	-10.0	1	199.0	18.1	20.8
Thailand	400		25	1	0.2	-33.0	4	155.8	30.0	23.8
Total Asia-Pacific	14,922,260	101,236	6,692	73	1,813.6	10.0	101	7,915.7	633.1	765.6

*Includes 14 trillion northwest shelf. †Adjusted. ‡Condensate.

EUROPE										
Austria	175,000	500	1,270	4	46.6	- 2.0	1	220.5	24.1	23.0
Belgium							8	831.6	58.6	91.3
Cyprus							1	12.0		2.0
Denmark	250,000	1,800	(*)	1	3.0		3	221.8	40.4	34.4
Finland							2	186.0	46.0	26.1
France	81,000	6,800	175	4	31.0	-16.0	23	2,949.3	220.5	399.1
Germany, West	551,000	12,700	2,833	5	138.0	- 5.0	33	2,697.7	340.4	344.7
Greece				1			4	124.5		14.4
Ireland†							1	58.0		13.3
Italy & Sicily	220,000	6,100	128	8	21.0	-12.0	34	3,593.1	322.5	384.6
Netherlands	250,000	88,000	319	8	30.0	- 7.0	7	1,825.5	83.6	158.8
Norway	\$2,000,000	15,000	4	5	34.0	496.0	3	173.0	24.0	18.5
Poland**										
Portugal							2	79.8	23.4	9.9
Romania**										
Spain	\$55,000	500	22	3	3.0	16.0	9	1,025.7	16.2	129.9
Sweden							5	243.6	33.0	44.4
Switzerland							2	120.0	21.0	20.0
United Kingdom	5,000,000	45,000	56	13	2.0	25.0	21	2,464.6	251.4	328.2
Yugoslavia	\$3,500,000	2,000		6	59.0	- 3.0				
Total Europe	12,082,000	178,400	4,807	58	367.0	2.0	159	16,826.7	1,505.1	2,042.6

*On production Aug., 1972. †Oil or gas discovered but not developed.

‡Adjusted. **Not included in free-world total. †Adjusted (government figures).

MIDDLE EAST										
Abu Dhabi	20,768,000	12,000	115	5	1,000.0	7.0				
Bahrain	375,000	5,000	236		72.0	- 4.0	1	250.0	53.2	14.3
Dubai	2,000,000	1,000	21	3	130.0	4.0				
Iran	\$65,000,000	200,000	313	10	4,900.0	8.0	4	620.0	52.0	85.3
Iraq	29,000,000	25,000	132	5	1,500.0	-12.0	6	98.5		5.0
Israel	9,000	50	30	1	120.0	- 7.0	1	147.4	57.9	16.8
Jordan							1	14.8	2.5	0.9
Kuwait	64,900,000	33,000	692	2	2,750.0	- 5.0	5	647.0	11.0	15.0
Lebanon							2	53.5		7.3
Neutral Zone	16,000,000	7,500	440	1	545.0	- 1.0				
Oman	5,000,000	1,750	97	2	280.0	- 3.0				
Qatar	7,000,000	8,000	84	2	450.0	4.0	1	0.7		
Saudi Arabia	138,000,000	50,000	535	8	5,255.0	17.0	2	428.3		29.3
South Yemen (Aden)							1	160.2		8.6
Syria	7,250,000	700	123	2	120.0	9.0	1	51.3	18.0	2.2
Turkey	550,000	150	290	5	65.0	- 1.0	4	286.0	23.6	29.0
Total Middle East	355,852,000	344,150	3,108	46	17,187.0	5.0	29	2,757.7	218.2	213.7

‡Adjusted. **Includes Sinai fields.

AGO 530117

53%
10.6% of world oil production

COUNTRY	RESERVES 1-1-73		WELLS		OIL PRODUCTION		REFINING			
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-72	Drilling 12-1-72	Estimated 1972 (1,000 b/d)	% change from 1971	Capacity (1,000 b/d) Jan. 1, 1973			
							No. refin- eries	Crude	Cracking	Refum- ing
AFRICA										
Algeria	47,000,000	105,000	524	17	1,061.0	36.8	3	60.7		14.5
Angola (incl. Cabinda)	1,200,000	1,000	161	6	135.0	17.4	2	16.0		1.9
Congo-Brazzaville	5,000,000	<i>export</i>	17	3	7.5	2,400.0				
Congo-Kinshasa (See Zaire)										
Dahomey†	1,000									
Egypt	5,200,000	7,500	245	4	227.0	-22.7	2	98.5		
Ethiopia							1	14.8		2.0
Gabon	1,100,000	7,000	114	3	125.0	8.7	1	17.0	7.0	2.0
Ghana†							1	26.6		6.2
Ivory Coast							1	24.4		2.8
Kenya							1	48.0		4.0
Liberia							1	12.5		2.0
Libya	30,400,000	27,500	763	8	2,230.0	-19.3	5	17.4		2.0
Malagasy							1	14.6		2.3
Morocco	1,000	15	32	2	0.3	-57.0	2	58.6	3.6	7.6
Mozambique†							1	17.0		2.5
Nigeria	15,000,000	40,000	774	30	1,800.0	17.5	1	60.0		5.7
Rhodesia							(not operating — not included in total)			
Senegal							1	12.0		2.0
Sierra Leone							1	19.0		
Sudan							1	20.0		2.0
Tanzania							1	16.8		4.2
Tunisia	1,000,000	1,000	42	3	80.0	-7.0	1	21.4		3.0
Union of South Africa†							5	242.6	66.1	46.6
Zaire†	500,000						1	16.2		2.9
Total Africa	106,402,000	189,015	2,672	77	5,665.8	- .02	34	825.1	76.7	116.2

*Revised (government figure). †Oil or gas discovered but not yet producing.

WESTERN HEMISPHERE										
Antigua							1	17.3		1.9
Argentina	4,900,000	8,800	5,311	50	435.0	2.8	15	601.6	218.7	48.0
Bahamas							1	250.0		
Barbados*	750			1			1	3.0		
Bolivia	200,000	5,000	235	2	32.0	-13.5	5	21.7		
Brazil	857,000	918	1,213	28	167.0	-0.4	10	718.3	164.7	24.6
British Honduras										
British West Indies										
Chile	125,000	5,000	374	7	32.5	-7.5	3	123.5	34.7	10.0
Colombia	1,500,000	2,400	1,865	6	192.0	-16.2	6	172.1	65.5	2.0
Costa Rica							1	7.6	2.7	1.1
Cuba	9,000		20	3	3.5					
Dominican Republic							1	16.0		
Ecuador	5,750,000	<i>Egypt 500</i>	717	6	59.4	1,548.6	3	35.5	8.5	
El Salvador							1	14.0		4.6
Guatemala*	10,000			1			2	26.0		6.0
Honduras				1			1	14.0		1.8
Jamaica							1	31.0	2.8	
Martinique							1	11.0		2.1
Mexico	2,800,000	11,500	3,421	43	440.0	0.1	6	624.5	141.0	87.3
Netherlands Antilles							2	880.0	455.0	22.0
Nicaragua							1	13.2		2.6
Panama							1	75.0	19.0	7.5
Paraguay							1	5.0		
Peru	750,000	3,000	2,296	10	60.2	-2.9	5	101.5	22.7	1.8
Puerto Rico							3	291.0	70.5	76.0
Trinidad & Tobago	2,000,000	7,500	2,896	13	143.0	10.8	3	441.0	26.5	27.0
Uruguay							1	40.0	4.0	2.0
Venezuela	13,700,000	34,600	11,245	20	3,200.0	-9.8	12	1,499.0	170.0	8.8
Virgin Islands							1	418.0		13.5
United States	536,823,271	271,455	525,885	1,163	9,500.0	-0.3	247	13,087.0	4,852.0	3,169.1
Canada	10,200,000	155,000	20,911	163	1,490.0	10.4	41	1,725.0	427.0	290.0
Total W. Hemisphere	79,625,021	405,673	576,389	1,517	15,754.6	-1.0	378	21,262.8	6,685.3	3,809.7

*Oil or gas discovered but not yet producing. †Does not include Arctic gas.

‡Includes Alaska 10 billion.

Total Free World	568,893,281	1,218,474	593,668	1,771	40,788.6	2.0	701	49,588.0	9,118.4	6,947.8
Communist World	*98,000,000	†664,400			8,910.0	5.2				
Total World	666,893,281	1,882,874			49,698.6	3.0				

*Including Russia 75 billion, Red China 19.5 billion, Hungary 1 billion, others 2.5 billion.

†Including Russia 685.4 trillion, Red China 21 trillion, Hungary 3 trillion, & Poland 5 trillion.

06J

Trends in western-bloc refining

	Capacities in 1,000 b/d					Projected Capacities in 1,000 b/d		
	1-1-68	1-1-69	1-1-70	1-1-71	1-1-72	1-1-73	1-1-74	1-1-75
Crude-oil capacities								
Asia-Pacific	4,265	4,920	5,554	6,061	6,818	7,916	8,500	8,900
Africa	732	756	785	925	902	825	875	925
Middle East	2,053	2,296	2,438	3,172	2,851	2,758	2,900	3,100
Latin America	4,675	4,984	5,113	5,679	6,139	6,451	6,700	7,000
Western Europe	11,085	12,884	13,941	15,177	16,962	16,826	17,500	18,000
Total	22,810	25,840	27,831	31,014	33,672	34,776	36,475	37,925
Total, western bloc	35,698	39,274	41,921	45,743	48,692	49,588	51,750	53,425
Cracking (thermal & catalytic)								
Asia-Pacific	421	453	507	609	629	633	650	675
Africa	58	58	74	90	86	77	80	85
Middle East	131	111	155	197	212	218	230	240
Latin America	1,492	1,420	1,426	1,381	1,443	1,406	1,500	1,600
Western Europe	1,255	1,245	2,284	1,716	1,558	1,505	1,600	1,700
Total	3,347	3,287	3,446	3,993	3,928	3,839	4,060	4,300
Total, western bloc	11,789	11,857	12,278	13,029	13,032	13,900	14,000	14,500
Reforming (thermal & catalytic)								
Asia-Pacific	464	525	593	642	702	765	780	800
Africa	133	130	133	152	143	116	130	150
Middle East	212	243	215	235	233	214	230	250
Latin America	268	258	279	386	357	351	370	390
Western Europe	1,431	1,749	1,949	2,027	2,185	2,042	2,200	2,300
Total	2,508	2,905	3,169	3,442	3,620	3,488	3,710	3,890
Total, western bloc	5,098	5,657	6,179	6,606	6,918	6,947	7,300	7,500
Hydroprocessing								
Asia-Pacific	770	1,056	1,263	1,619	2,025	2,788	2,900	3,100
Africa	124	127	123	247	233	126	140	150
Middle East	158	341	332	473	489	478	490	500
Latin America	300	311	514	734	1,049	1,220	1,400	1,500
Western Europe	1,830	2,533	2,986	3,592	4,465	4,557	4,600	4,800
Total	3,182	4,368	5,218	6,665	8,261	9,169	9,530	10,050
Total, western bloc	7,346	8,724	9,834	11,570	13,531	15,398	16,000	17,000

during the summer of '72, Shell decided to issue a statement to counter unfounded rumors.

In late August, Shell announced a discovery—no figures revealed—at its 211/26-1 wildcat, only 20 miles west-northwest of the Brent field. Despite the lack of statistics, industry observers are confident that the second giant, now named Cormorant, is probably bigger even than Brent, for in August 1971, the two companies had plunked down \$50 million in an auction bid for block 211/21 immediately north of the Cormorant discovery. This "golden block" is now being drilled for the first time.

Not long after the Shell announcements came word from the Signal Group 2 (19% Signal, 22.5% Champin, 20% United Canso, 22.5% Santa Fe International, 5% North Sea Petroleum Ltd., 1% Charterhouse Se-

curities, and 10% Tricentrol) that it too had found oil in Block 211.

The wildcat, 211/18-1, flowed 5,293 b/d of 37° low-sulfur oil on an 8-hr test on a 40/65-in. choke from an undisclosed horizon. While Signal was careful not to overplay the find, it is believed that another giant has been tapped at the site, now called Halibut. Signal is to drill some confirmation wells on the structure next spring.

Other oil discoveries of the year came at Heimdal (Pan Ocean Group) in Norwegian block 25/4; Beryl (Mobil) in U.K. block 9/13; Bream (Phillips Group) in Norwegian block 17/12; Shell-Esso in U.K. block 16/8; Hamilton Bros. in U.K. block 15/24; Amoco in U.K. block 23/21; Hamilton Bros. in U.K. block 30/24; and three new strikes in the Ekofisk complex off Norway—Phillips Group's Edda (2/7-4X), Amoco's 2/5-3, and Shell's 1/6-1.

World output tops 50 million. The industry saw its production record over a new milestone in 1972, as the world total topped 50 million b/d for the first time in April. For the next 3 months, it fell back, but in August surged again to 51.2 million b/d and to 52 million b/d in September. It probably will never drop below the 50 million mark again.

Worldwide, crude production will grow about 3½% for all of 1972. The Communist bloc is growing faster at 5% than the free world at about 2.5-3%.

The Middle East continues to supply the bulk of free-world oil (43%), with an 8½% growth rate over the year, to reach about 19 million b/d.

Refining climbs. Western-bloc refining capacity outside the U.S. and Canada will hit nearly 35 million b/d on Jan. 1, 1973, according to the Journal's detailed worldwide survey.

The 34.8-million-bbl total compares with 33.7 b/d chalked up on Jan. 1, 1972. Or, using a stream factor of 0.95, the growth was 2.6 million b/d during 1972. (Journal figures for Jan. 1, 1972, and before are on a stream-day basis; those for Jan. 1, 1973, and later will be on a calendar day).

Projected total crude capacities for western bloc outside U.S. and Canada for Jan. 1, 1974, and Jan. 1, 1975, respectively, are 36.5 and 37.9 million b/d. When U.S. and Canadian figures are added, projected western-bloc totals are 51.8 and 53.4 million b/d for 1974 and 1975.

Biggest increase in crude capacity during the past year came in the Asia-Pacific area, where a 1.1-million-b/d gain was chalked up. Japan showed a 500,000-b/d growth, and South Korea added over 200,000 b/d.

The Asia-Pacific area also recorded a growth of nearly 800,000 b/d in hydroprocessing capacity. Most of the increase was recorded in Japan, where total hydroprocessing capacity now stands at 1.81 million b/d.

There was little change in western-bloc cracking and reforming capacity total during 1972.

Other "firsts." A few other landmarks were posted in international oil in 1972. Among them was a welcome to two new oil countries, as the first discoveries were made in Guatemala and in the Persian Gulf emirate of Sharjah. Both should begin production next year.

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est producer, as crude from the North Sea's Dan field began flowing into Danish refineries in August.

And Ecuador became the world's newest exporter of crude oil, as oil from its eastern Oriente fields flowed over the Andes to the Pacific Coast for the first time in July.

Another country to come into flush

production for the first time was Congo-Brazzaville, where Elf-Congo began test production in January at its offshore Emeraude Marine field. Elf found the 7-billion-bbl giant in 1969.

Something to remember. 1972 will go into oil's history books as the year that the balance of power shifted from the international oil companies

to the producing countries, an event that was unimaginable only 3 years ago.

Despite its turbulence, its upsets, its nationalizations, its permanent changes, the year brought about a kind of peace between producer, transporter, and consumer that will be something to remember. END

Worldwide refining

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
ALGERIA	Cia. Raffinage en Afrique du Nord (CRAN), Hassi Messaoud	3,135	.....	.....	.....
	Sonatrach—Raffinerie d'Alger, Maisan Carree	57,000	.....	14,500 C	.....
	El Borma	600	.....	.....	.....
	Total	60,735	.....	14,500 C	.....
ANGOLA	Cabinda Gulf, Cabinda	2,800	.....	.....	.....
	Companhia de Petroleos de Angola (SARL), Luanda	13,200	.....	1,900 C	1,900 V, 2,800 DHD, 950 A
	Total	16,000	.....	1,900 C	.....
ANTIGUA	West Indies Oil Co., Ltd., St. John's	17,300	.....	1,920 C	2,000 DHT, 4,800 DHD
ARGENTINA	Astrasur, Refinerías Patagónicas de Petróleo Sociedad Anónima, Comodoro Rivadavia	6,800	2,200 T 3,200 Vis	.....	4,800 V, 5,300 A
	Cóndor, Sociedad Anónima Petrolera Argentina, Lomas de Zamora	1,425	450 T	.....	450 V, 450 L
	Esso SAPA, Campana	87,400	13,800 CK 17,900 FCC 9,000 Vis	8,000 C	47,800 V, 8,000 DHT, 1,000 L, 570 C, 3,300 A
	Galván	17,000	.....	.....	450 V, 450 L
	Lottero Papini SA, Avellaneda	1,900	.....	.....	.....
	Ragor SAIC, Quilmes	600	.....	.....	.....
	Refinería de Petróleo la Isaura SA, Bahía Blanca	12,580	1,450 T	.....	.....
	Shell Compañía Argentina de Petróleo SA, Buenos Aires	115,000	20,000 Vis 21,000 C	9,000 C	25,000 DHT
	Yacimientos Petrolíferos Fiscales:				
	Campo Durán	26,900	.....	.....	.....
	Dock Sud	5,700	2,300 T	.....	1,500 V
	El Centauro, Tierra del Fuego	18,000	.....	.....	.....
	La Plata	182,500	40,500 FCC 22,100 CK	15,500 C	61,000 V, 3,800 DHT, 8,500 DHD, 700 Alky, 440 P, 3,150 L, 650 C, 1,550 A
	Luján de Cuyo	107,700	3,400 T 9,100 Vis 17,000 CK 14,300 FCC	15,500 C	56,800 V, 18,700 DHC, 2,500 DHD, 1,000 C
	Plaza Huincul	4,800	5,700 T	.....	.....
	San Lorenzo	31,100	4,000 T 11,300 Vis	.....	9,000 V
	Total	601,585	93,700 C 125,000 T	48,000 C	.....

Abbreviations used with the refining tabulations

(All figures in barrels per calendar day).

All figures are as of 1-1-73

Cracking processes:
C—Cat cracking
CK—Coke
FCC—Fluid cat cracking
HD—Houdrifiow cat cracking
T—Thermal cracking

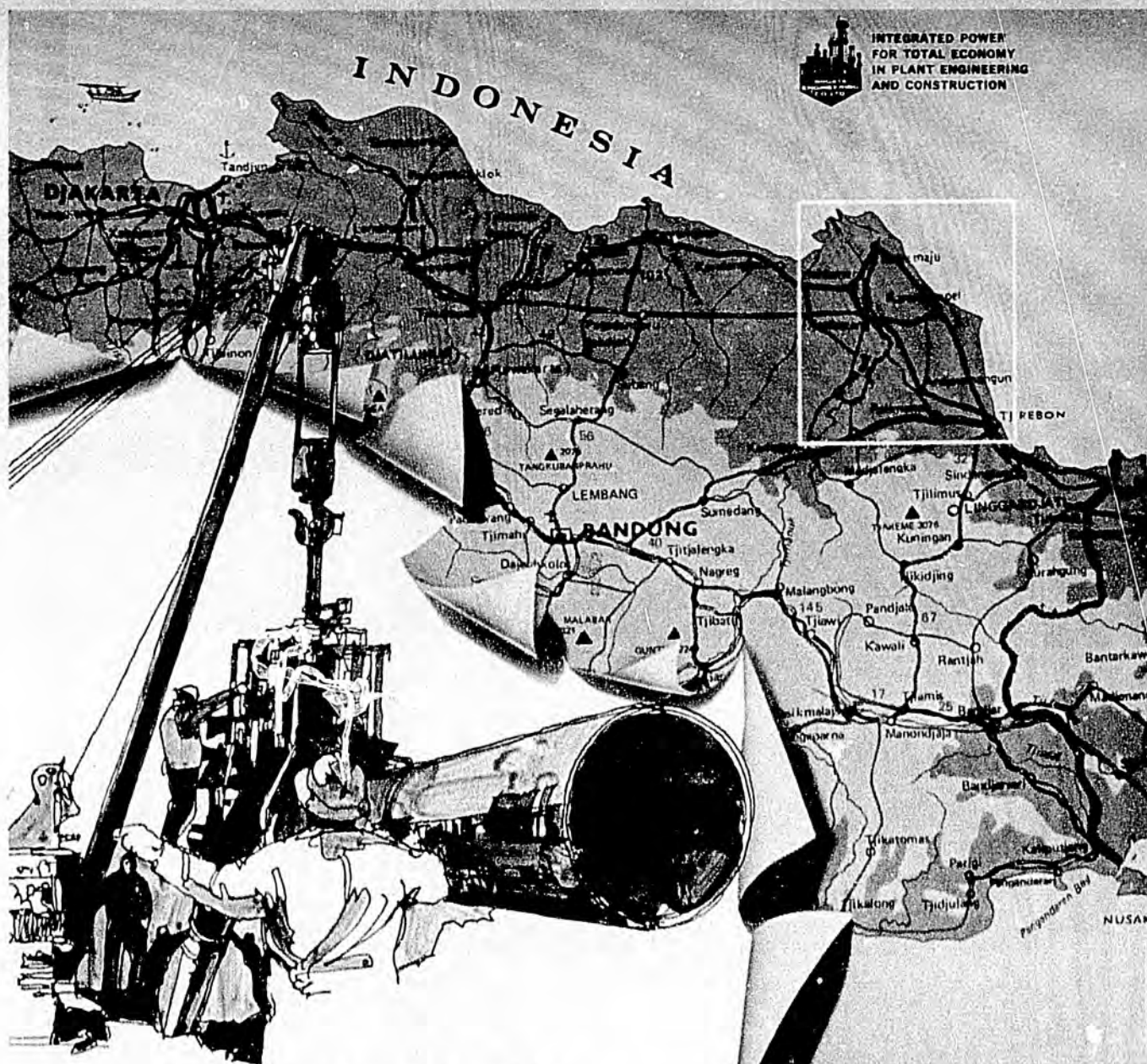
TCC—Thermoform cat cracking
Vis—Visbreaking

Reforming processes:
C—Catalytic
T—Thermal

Other processing:
A—Asphalt
Alky—Alkylation
C—Coking (t/d)
DHT—Distillate hydrotreating
DHD—Distillate hydrodesulfurization
RHC—Residual hydrocracking
DHC—Distillate hydrocracking

Is—Isomerization
L—Lube manufacture
P—Polymerization
RHD—Residual hydrodesulfurization
SD—Solvent decarbonizing
V—Vacuum distillation
W—Waxes

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
AUSTRALIA	Amoco Australia Pty. Ltd., Brisbane	25,000	8,750 FCC	5,000 C	14,500 V, 14,250 DHD, 1,400 Alky, 8,600 A
	Ampo: Refineries Ltd., Lytton	60,000	21,500 FCC	11,800 C	26,000 V, 2,500 Alky, 1,500 Poly
	Australian Oil Refining Pty. Ltd., Kurnell	93,000	40,900 FCC	13,300 C	48,500 V, 3,200 Alky, 2,800 Poly, 12,800 SD
	Kurnell (lube refinery) .....	.....	.....	.....	7,100 V, 6,500 DHT, 3,775 L
	BP Australia Ltd., Kwinana	98,735	14,520 FCC	17,630 C	40,950 V, 16,380 DHT, 7,735 DHD, 1,553 L, 475 A
	Westernport	45,500	.....	13,333 C	3,185 V, 15,470 DHT, 678 A
	Petroleum Refineries Australia Pty. Ltd.— Adelaide	45,000	.....	14,500 C	2,500 V, 30,000 DHD, 1,000 A
	Alltona	98,500	24,000 FCC	24,000 C	22,000 V, 30,000 DHT, 9,500 DHD, 2,000 Alky, 3,000 A
	Shell Refining (Australia) Pty. Ltd., Clyde	55,000	17,000 C	9,900 C	22,000 DHT, 6,000 DHD
	Geelong	92,000	18,000 C	17,000	36,000 DHT, 11,000 DHD
AUSTRIA	Total Refineries Australia Ltd., Matraville ...	30,000	.....	6,000 C	12,000 V, 11,000 DHT, 4,300 DHC
	Total	632,735	144,670 C	131,563 C	
BAHAMAS	Osterreichische Mineralolverwaltung AG, Schwechat	220,500	16,300 FCC 7,800 T	23,000 C	48,000 V, 24,780 DHT, 23,000 DHD, 700 L, 36,000 A
	Bahamas Oil Refining Co., Freeport	250,000	.....	.....	70,000 V
BAHRAIN	Bahrain Petroleum Co. Ltd., Awali	250,000	34,200 FCC 19,000 Vis	14,300 C	40,500 V, 14,300 DHD, 1,300 Poly, 2,400 A
	Eastern Refinery Ltd., Chittagong	30,600	.....	1,620 C	1,804 DHT, 1,660 DHD
BANGLADESH	Mobil Oil Barbados Ltd., Bridgetown	3,000	.....	.....	400 A
	BARBADOS				
BELGIUM	Albatros SA, Antwerp	57,000	.....	8,550 C	15,930 DHD
	Anglo-Beige des Petroles SA, Antwerp-Kiel ...	4,900	.....	.....	.....
	Belgian Shell NV, Ghent	9,000	.....	.....	.....
	Esso Belgium NV, Antwerp	95,000	9,500 FCC	7,800 C	32,000 V, 40,600 DHT, 550 L, 7,500 A
	NV Societe Industrielle Beige des Petroles SA (SIBP), Antwerp	297,700	49,100 FCC	28,400 C	105,900 V, 55,800 DHT, 53,900 DHD, 4,300 Alky, 1,560 Poly, 11,400 A
	Raffinerie Beige de Petroles, Antwerp	98,000	.....	19,000 C	14,000 V, 27,000 DHT, 10,000 DHD, 9,200 A
	SA Chevron Belgium NV, Feluy	130,000	.....	10,000 C	60,000 V, 10,000 DHT, 23,000 DHD, 2,300 A
	Texaco Belgium NV, Ghent	140,000	.....	17,500 C	46,000 DHT
	Total	831,600	58,600 C	91,250 C	
	BOLIVIA				
BOLIVIA	Yacimientos Petroliferos Fiscales Bolivianos (YPFB):				
	Camiri	1,140	.....	.....	.....
	Cochabamba	13,300	.....	.....	450 V, 450 L
	Sanandita	570	.....	.....	.....
	Santa Cruz	2,850	.....	.....	.....
	Sucre	3,800	.....	.....	.....
	Total	21,660	.....	.....	
BRAZIL	Companhia de Petróleo da Amazonia, Paredao, Manaus	10,000	2,000 FCC	.....	3,000 V, 100 A
	Petróleo Brasileiro SA (Petrobras):				
	Betim, Minas Gerais	57,000	12,000 FCC	.....	22,000 V, 1,500 A
	Canoas, Rio Grande de Sul	57,000	12,000 FCC	.....	22,000 V, 1,500 A
	Cubatao, Sao Paulo	170,000	43,000 FCC	10,000 C	85,000 V, 5,000 A
	Duque de Caxias, Rio de Janeiro	190,000	34,000 FCC	11,000 C	100,000 V, 4,400 DHT, 4,400 L, 4,000 A
	Mataripe, Bahia	72,000	15,000 FCC	.....	40,000 V, 2,000 A
	Paulina, Sao Paulo	114,000	30,000 FCC	.....	57,000 V, 3,000 A
	Refinaria de Petróleo Ipiranga SA, Rio Grande	9,300	.....	.....	1,098 A
	Refinaria de Petróleos de Manguinhos SA, Rio de Janeiro	9,500	3,600 Vis	3,600 T	



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WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
BRAZIL—Continued	Refinaria e Exploracao de Petroleo (Uniao) SA, Capuava, Sao Paulo	29,450	13,050 TCC		9,000 V, 900 P
	Total	718,250	161,050 C 3,600 T	21,000 C 3,600 T	
BRUNEI	Sarawak Shell Berhad, Seria	60,000			
BURMA	Myanma Oil Corp., Chauk	6,100			
	Syriam	19,200	1,635 T		
	Total	25,300	1,635 T		
CAMBODIA	Societe Khmere de Raffinage de Petrole, Krung Kompong Som	12,540		1,800 C	5,850 DHT
CEYLON	Ceylon Petroleum Corp., Sapugaskanda	37,400	9,000 Vis	2,500 C	1,900 V, 7,600 DHT, 7,000 DHD, 1,000 A
CHILE	Empresa Nacional del Petróleo, Concepción ..	72,000	14,300 FCC 8,400 Vis	4,000 C	38,000 V
	Concón	50,000	12,000 FCC	6,000 C	24,000 V, 1,100 Alky, 1,000 A
	Magallanes	1,500			
	Total	123,500	26,300 C 8,400 T	10,000 C	
COLOMBIA	Colombian Petroleum Co., Tibú	4,200			
	Empresa Colombiana de Petróleos, Barrancabermeja	110,000	35,000 FCC 16,000 Vis	2,000 C	55,000 V, 2,500 Alky, 3,300 L, 3,500 A, 1,300 W
	International Petroleum (Colombia) Ltd., Cartagena	49,000	14,500 C		30,000 V, 3,500 P, 450 L
	La Dorada	5,500			
	Texas Petroleum Co., Guamo	2,300			
	Orito (with Gulf Oil)	1,110			
	Total	172,110	49,500 C 16,000 T	2,000 C	
COSTA RICA	Refinadora Costarricense de Petroleo SA, Moin, Limon	7,600	2,700 T	1,080 C	1,980 DHT
CUBA	Cia. Petrolera Shell de Cuba, Havana	27,000		5,000 C	
	Esso Standard Oil Co., Havana	46,000	24,000 FCC	7,000 C	2,000 DHT, 1,300 P, 1,000 A
	The Texas Co. (West Indies) Ltd., Santiago de Cuba	20,000		3,000 C	
	Total	93,000	24,000 C	15,000 C	
	All privately owned companies seized by government and now operated by Empresa Consolidada de Petrolea, S.A.				
CYPRUS	Cyprus Petroleum Refinery Ltd., Larnaca	12,000		2,000 C	
DENMARK	A/S Dansk Shell, Fredericia	59,000	24,000 Vis	10,000 C	14,000 DHT, 8,000 DHD
	Dansk Esso A/S, Kalundborg	72,800		7,300 C	22,000 V, 8,000 DHT, 12,000 DHD, 11,000 A
	Gulhavn, Skaelskor	90,000	10,700 T 5,700 Vis	17,100 C	14,950 V, 26,360 DHT, 24,225 DHD
	Total	221,800	40,400 T	34,400 C	
DOMINICAN REPUBLIC	Falconbridge Dominicana C por A, Santo Domingo	16,000			
ECUADOR	Anglo-Ecuadorian Oilfields Ltd., La Libertad ..	27,200	8,500 T		
	Petroleos Gulf del Ecuador CA, La Libertad ..	7,300			
	Texaco Petroleum Co., Lago Agrio	950			
	Total	35,450	8,500 T		
EGYPT	Alexandria Petroleum Co. (Petmex), Alexandria Amreya refinery	66,500 32,000			
	Total	98,500			
EL SALVADOR	Refineria Petrolera Acajutla SA (RASA), Acajutla	14,000		2,600 T 2,000 C	4,650 DHD

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
ETHIOPIA	Ethiopian Petroleum SC, Assab	14,790		2,000 C	1,840 V, 3,300 DHT, 440 A
FINLAND	Neste Oy, Naantali	56,000	11,000 TCC	6,800 C	15,000 V, 7,620 DHT, 7,400 DHD, 2,600 Poly, 6,500 A
	Porvoo	130,000	14,000 Vis 21,000 FCC	18,000 C 1,300 T	53,000 V, 29,100 DHT 14,000 DHC, 37,000 DHD, 7,500 Poly, 6,400 A
	Total	186,000	32,000 C 14,000 T	24,800 C 1,300 T	
FRANCE	Antar Petroles de l'Atlantique, Donges	180,000	12,500 FCC	33,300 C	13,000 DHD, 3,200 A
	Valenciennes (Nord)	78,000		14,000 C	
	Vern-sur-Seiche	31,000		7,500 C	
	Compagnie Francaise de Raffinage, Gonfreville l'Orcher	484,000	24,300 FCC	64,380 C	56,000 V, 69,400 DHT, 85,000 DHD, 2,800 Poly, 7,400 L, 20,250 A
	La Mede	212,000	26,500 FCC	41,000 C	47,500 V, 820 DHT, 53,000 DHD, 820 Poly, 16,200 A
	Compagnie Rhenane de Raffinage, Reichstett Vendenheim	75,000	16,000 Vis	13,000 C	24,000 DHT, 16,000 DHD
	Elf Union: Raffinerie de L'ile de France, Grandpuits	84,000		12,000 C	27,000 V, 24,000 DHT, 8,300 DHD, 3,100 A
	Raffinerie du Vexin, Gargenville	130,000			
	Raffinerie Elf Rhone-Alpes, Feyzin	151,000	16,000 FCC 11,000 Vis	7,000 C	33,000 V, 7,000 DHT, 3,500 A
	Raffinerie Union Industrielle des Petroles, Ambes	42,000	7,700 FCC	4,400 C 4,000 T	19,600 V, 760 Poly
	Esso Standard SAF, Bordeaux	58,000		8,000 C	28,000 V, 2,400 A
	Fos sur Mer	70,000	11,500 FCC	10,700 C	19,600 V, 22,800 DHT, 2,200 A
	Port Jerome	150,000	12,000 FCC	27,000 C	42,000 V, 46,500 DHT, 12,000 DHD, 5,600 L, 7,800 A
	Mobil Oil Francaise, Frontignan	80,000	11,000 TCC	17,000 C	22,000 DHT, 25,000 DHD, 1,000 A
	Notre Dame de Gravenchon	72,500		14,500 C	10,500 V, 14,500 DHT, 7,000 DHD, 3,700 L
	Raffinerie de Strasbourg, Herrlisheim Bas-Rhin	95,000		21,600 C	19,080 V, 21,600 DHT, 13,500 DHD, 7,380 A
	Shell Francaise, Berre l'Etang	165,000	4,000 Vis 17,000 C	24,000 C	33,000 DHT, 13,000 DHD
	Pauillac	90,000	24,000 C	15,000 C	32,000 DHT, 13,000 DHD
	Petit Couronne	180,000	6,000 Vis 21,000 C	16,000 C	31,000 DHT, 14,000 DHD
	Societe Francaise des Petroles BP, Dunkirk	113,750		12,900 C	17,290 V, 5,187 DHT, 3,262 L, 2,440 A
	Lavera	232,960		6,880 C	40,586 V, 14,287 DHT, 13,650 DHD, 1,858 A
	Vernon	70,070		9,890 C	5,100 V, 18,200 DHT, 10,920 DHD, 1,356 A
	Societe de la Raffinerie de Lorraine (CRF 51%, Esso 40%, Elf Union 9%), Hauconcourt	105,000		15,000 C	16,000 V, 35,000 DHT, 11,500 DHD, 9,100 A
	Total	2,949,280	183,500 C 37,000 T	395,050 C 4,000 T	
GABON	Société Equatoriale de Raffinage, Port Gentil	17,000	7,000 Vis	2,000 C	4,000 DHT
GERMANY, WEST	BP Benzin und Petroleum AG, Dinslaken	103,740	10,912 FCC	12,040 C	21,840 V, 9,100 DHD, 3,729 A
	Hamburg	99,550		6,880 C	46,950 V, 8,645 DHD, 1,492 A
	Vohburg	100,100	10,560 FCC	15,480 C	21,840 V, 25,480 DHT, 13,468 DHD, 4,068 A
	Callex Deutschland GmbH, Raunheim	90,000		3,500 C	28,000 V, 6,500 DHT, 8,600 DHC
	Deutsche Marathon Petroleum GmbH, Burghausen, Bavaria	60,000			10,000 DHT, 550 C
	Deutsche Shell AG, Godorf	180,000	38,500 T	20,000 C	55,000 DHT, 49,000 DHD
	Harburg/Grasbrook	85,000	12,000 C 17,000 T	8,000 C	16,000 DHT, 12,000 DHD, 600 P, 3,452 L
	Ingolstadt	55,000	11,000 T	7,000 C	17,000 DHT, 17,000 DHD 1,726 L
	Monheim	7,000			
	Deutsche Texaco AG, Heide	65,000	8,000 TCC	14,000 C	21,000 V, 24,000 DHT, 800 P, 3,500 A
	Erdol Raffinerie Duisburg GmbH, Duisburg	37,800		7,300 C	7,300 DHT, 4,200 DHD

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
GERMANY—Continued					
	Erdoelraffinerie Ingolstadt AG, Ingolstadt-Donau	65,000	.....	13,500 C	13,500 DHT, 6,500 DHD
	Erdol-Raffinerie Mannheim GmbH, Mannheim	123,000	.....	7,900 C	3,500 DHD
	Erdol-Raffinerie Neustadt GmbH & Co., Neustadt-Donau	99,000	11,700 FCC	17,700 C	24,000 V, 26,500 DHT, 21,000 DHD, 8,550 A
	Erdoel-Raffinerie Speyer, Speyer	57,800	.....	.....	.....
	Esso AG, Hamburg	122,000	7,500 FCC	13,400 C	15,300 V, 37,900 DHT, 22,300 DHD, 2,300 L, 11,300 A
	Ingolstadt	102,000	14,500 FCC	13,400 C	27,700 V, 31,300 DHT, 32,800 DHD, 9,100 A
	Karlsruhe	183,000	22,600 T	30,000 C	45,000 V, 54,700 DHT, 58,700 DHD, 30,600 A
	Koln	116,300	.....	9,300 C	17,000 V, 9,700 DHT, 11,700 DHD, 12,900 A
	Gelsenberg AG, Gelsenkirchen-Horst	144,000	23,400 Ck 11,000 TCC	30,700 C	16,100 V, 16,300 DHT, 31,400 DHD, 370 C
	Gewerkschaft Erdol-Raffinerie Deurag-Nerag, Misburg	54,000	12,000 Ck	8,000 C	7,000 DHD, 2,301 L
	Gulf-Erdoelwerke Frisia AG, Emden	47,500	.....	9,500 C	15,590 DHT
	Mobil Oil AG, Bremen	30,000	7,500 TCC	5,500 C	6,500 V, 6,000 DHT, 6,000 DHD, 800 L
	Worth	75,000	12,000 FCC	14,000 C	18,000 V, 26,000 DHT, 19,000 DHD
	Oberrheinische Mineralolwerke GmbH, Karlsruhe	128,000	11,600 T 4,700 Vis	20,500 C	21,200 V, 20,500 DHT, 18,100 DHD, 11,800 A
	Occidental Oel GmbH, Brunsbüttel	7,500	.....	.....	6,700 A
	Stadthafen Essen	15,000	.....	.....	10,000 V, 7,500 A
	Oelwerke Julius Schindler MmbH, Hamburg	7,600	.....	.....	5,460 V, 5,000 DHT, 3,384 L
	Saarland-Raffinerie GmbH, Kokereistrabe	55,000	.....	.....	.....
	Union Rheinische Braunkohlen Kraftstoff AG, Wesseling	125,000	43,000 Vis	9,750 T 8,400 C	15,100 DHT, 10,100 DHD 650 P
	Veba-Chemie AG, Gelsenkirchen-Buer	162,000	17,000 Vis 4,900 FCC	22,800 C	6,300 V, 31,300 DHT, 10,900 DHD, 3,800 A
	Wintershall AG, Lingen, Emsland	91,000	15,400 Ck 13,600 FCC	15,830 C	16,100 V, 20,490 DHT, 12,820 DHD, 930 Poly, 420 C
	Salzbergen	4,790	.....	.....	770 DHT, 1,920 L, 1,170 A
	Total	2,697,680	124,172 C 216,200 T	334,930 C 9,750 T	
GREECE					
	Hellenic Aspropyrgos Refinery SA, Aspropyrgos (near Athens)	38,000	.....	8,100 C	5,860 V, 2,250 A
	Petrola Hellas, Athens	10,000	.....	.....	.....
	Athens	10,000	.....	.....	.....
	Thessaloniki Refining Co., Thessaloniki	66,500	.....	6,300 C	6,300 V, 24,120 RHT, 9,000 DHD, 2,430 A
	Total	124,500	.....	14,400 C	
GHANA					
	The Ghanaian Italian Petroleum Co. (Ghaip) Ltd.	26,600	.....	6,175 C	.....
GUAM					
	Guam Oil & Refining Co., Agana	29,500	.....	.....	.....
GUATEMALA					
	Refinería Petrolera de Guatemala-California Inc., Puerto Barrios	12,000	.....	3,000 C	5,000 DHD
	Texas Petroleum Co., Escuintla	14,000	.....	3,000 C	5,000 DHT
	Total	26,000	.....	6,000 C	
HONDURAS					
	Refinería Texaco de Honduras SA, Puerto Cortes	14,000	.....	1,800 C	5,000 DHT
INDIA					
	Assam Oil Co. Ltd., Digboi	12,100	990 Ck	.....	1,100 L, 45 C, 427 A
	Burmah-Shell Refineries Ltd., Trombay, Bombay	110,000	17,000 C	7,000 C	33,000 V, 8,500 A
	Caltex Oil Refining (India) Ltd., Visakhapatnam	32,000	9,100 FCC	.....	15,200 V, 3,600 SD, 1,337 A
	Cochin Refineries Ltd., Cochin	53,500	14,210 Vis	5,640 C	7,400 V, 26,080 DHD, 2,822 A
	Esso Standard Refining Company of India Ltd., Trombay, Bombay	70,000	10,000 FCC	.....	9,000 V, 6,500 A
	Indian Oil Corp., Barauni	44,000	12,000 Ck	.....	15,000 V, 850 L, 270 C
	Baroda	82,000	.....	7,000 C	.....
	Gauhati	16,000	6,500 Ck	.....	125 C

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
INDIA—Continued	Lube India Ltd. (Esso), Bombay	19,500	.....	.....	1,700 DHT, 3,200 L
	Madras Refineries Ltd., Manali	50,000	12,454 T	2,158 C	20,000 V, 5,922 DHT, 17,870 DHD, 6,062 RHD, 3,774 L, 4,000 A
	Total	489,100	36,100 C 46,154 T	21,798	
INDONESIA	Lemigas, Tjepu, East Java	4,000	.....	.....	.....
	Pertamina:				
	Balikpapan	75,000	.....	.....	13,000 V
	Dumai, Central Sumatra	100,000	.....	.....	.....
	Pakning (South), Central Sumatra	50,000	.....	.....	.....
	Pangkalan Brandan	2,000	.....	.....	200 L, 300 A
	Pladju, South Sumatra	110,000	10,000 T	16,000 T	24,000 V, 1,100 A, 350 P, 500 A
	Sungei Gerong	79,000	20,000 T 19,500 FCC	.....	87,000 V, 650 Alky, 1,200 P
	Wonokromo, East Java	4,000	.....	.....	750 A
	Total	424,000	30,000 T 19,500 C	16,000 T	
IRAN	Iranian Oil Exploration & Producing Co., Masjid Sulaiman	75,000	.....	.....	.....
	Iranian Oil Operating Companies, Abadan	430,000	36,000 FCC	44,000 T 25,000 C	90,000 V, 25,000 DHT, 10,600 Alky, 1,000 L, 9,750 A
	National Iranian Oil Co., Kermanshah	15,000	.....	2,780 C	4,980 DHT
	Tehran	100,000	16,000 Vis	13,500 C	40,000 V, 13,500 DHT, 16,000 DHC, 4,800 A
	Total	620,000	36,000 C 16,000 T	41,280 C 44,000 T	
IRAQ	Oil Refineries Administration:				
	Daura	71,000	.....	5,000 C	13,000 DHT, 8,160 L, 1,815 A
	K3-Haditha	7,000	.....	.....	.....
	Khanaqin	12,000	.....	.....	.....
	Muthia	4,500	.....	.....	.....
	Qaiyarah, Mosul	2,000	.....	.....	920 A
	Iraq Petroleum Co. Ltd., Kirkuk	2,000	.....	.....	.....
	Total	98,500	.....	5,000 C	
IRELAND	Irish Refining Co. Ltd., Whitegate	58,000	.....	13,300 C	5,000 DHD
ISRAEL	Oil Refineries Ltd., Haifa	147,368	42,105 T 15,789 Vis	16,842 C	51,263 DHT, 736 L, 3,167 A
	Total	147,368	57,894 T	16,842 C	
ITALY	Amoco Italia SpA, Cremona	100,000	.....	2,700 T 4,000 C	7,600 DHT, 7,100 DHD, 3,600 Isom
	ANIC SpA, Gela	92,000	21,000 FCC	14,200 C	32,000 V, 24,000 DHT, 26,000 DHD, 9,500 Alky, 1,000 C, 1,000 A
	Sannazzaro d'Burgondi	120,000	80,000 FCC	24,500 C	60,000 V, 24,500 DHT, 12,000 DHD, 5,200 Alky, 2,500 A
	Anonima Petroli Italiana, Falconara Marittima	81,000	9,000 Vis	3,600 T 10,000 C	13,000 V, 9,500 DHD, 3,000 A
	Aquila SpA, Aquilina, Trieste	50,000	.....	7,700 C	10,000 V, 300 DHT, 5,000 DHD, 1,300 L, 2,300 A
	BP Italiana, Volpiano	72,800	.....	10,750 C	18,200 DHT, 10,920 DHD, 5,280 Isom
	Edoardo Garrone, Genoa	147,000	12,520 Vis	14,270 C	21,400 DHD
	Gaeta Industrie Petroli SpA, Gaeta	39,900	27,000 FCC	11,250 C	10,800 DHT, 225 L
	Gulf Italiana SpA, Bertinico	78,000	.....	12,700 C	14,600 V, 18,500 DHT, 11,700 DHD, 2,400 Isom, 4,575 A
	Industrie Chimiche Italiane del Petrolio SpA (ICIP), Mantova-Frassino	65,000	.....	9,700 C	7,500 V, 14,600 DHT, 5,000 DHD, 2,000 Isom, 4,300 A
	Industria Leganti Stradali del Affini (Ilsea), Como	7,885	360 T	1,350 C	.....
	Industria Raffinazione Olii Minerali (IROM), Porto Marghera	110,000	.....	18,000 C	18,000 DHT, 18,500 DHD
	Liquichimica SpA, Milan	12,000	.....	1,000 C	.....
	Lombarda Petroli SpA, Villasanta, Milan	23,500	.....	3,600 C 630 T	4,800 DHT
	Mediterranea SpA, Milazzo, Sicily	479,750	5,400 Vis 40,500 FCC	9,000 T 9,000 C	9,000 DHD, 4,500 Alky

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
ITALY—Continued	Mobil Oil Italiana, Naples	130,000	14,500 TCC	12,500 C	7,500 V, 13,500 DHT, 10,500 DHD, 3,500 Alky, 750 L, 650 A
	Montecatini Edison SpA, Brindisi	41,800	.....	.....	.....
	Raffineria Dellepiane SpA, S. Quirico, Genoa	20,000	.....	.....	12,200 A
	Raffineria di Roma SpA, Rome	80,300	.....	12,300 C	9,300 V, 18,900 DHT, 8,500 DHD, 3,100 A
	Raffineria IPIOM, Sarissola, Genoa	31,200	.....	.....	5,700 V, 2,850 A
	Raffineria Olii Lubricanti (ROL), Viguzzola	1,425	.....	.....	.....
	Raffineria Sarde, Saras, Cagliari, Sardinia	256,500	27,000 FCC	17,550 C	45,000 V, 17,730 DHT, 27,000 DHD
	Raffinerie Siciliane Oli Minerali SpA (Rasiom), Augusta, Siracusa	210,000	40,000 FCC	15,300 C	189,200 V, 23,500 DHT, 25,000 DHD, 7,700 Alky, 5,200 L, 6,700 A
	Sanquirico SpA, Genoa	32,500	.....	1,300 C	11,500 DHD
	Sarpom, Novara	235,000	12,200 FCC	27,200 C	22,800 V, 89,300 DHT, 1,600 Poly, 2,800 A
	Shell Italiana SpA, La Spezia	86,000	.....	20,000 C	24,000 DHT, 12,000 DHD
	Rho	75,000	15,000 C	18,000 C	21,000 DHT, 12,000 DHD
	Taranto	90,000	.....	16,000 C	24,000 DHT, 12,000 DHD
	Sincat SpA, Priolo	313,500	18,000 FCC	9,450 C	36,000 V, 18,000 DHT, 15,300 DHD
	Societa Azionaria Raffinazione Olii Minerali (Sarom), Ravenna	153,900	.....	12,600 C 4,500 T	25,200 DHT
	Societa Italiana Resine SpA (Sardoil), Porto Torres, Sardinia	118,750	.....	11,700 C	14,400 DHD
	Societa Petroliifera Italiana, Arcola, La Spezia	18,400	.....	.....	.....
	Stanic Industria Petroliifera, Bari	105,000	.....	10,500 C	10,500 DHT, 19,300 DHC, 2,000 A
	Leghorn, Livorno	115,000	.....	24,000 C 3,740 T	26,800 DHT, 7,800 DHD, 6,700 L
	Total	3,593,110	295,200 C 27,280 T	360,420 C 24,170 T	.....

IVORY COAST	Societe Ivoirienne de Raffinage, Abidjan-Urudi	24,417		2,794 C	3,172 DHT
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JAMAICA	Esso West Indies Ltd., Kingston	31,000	2,800 FCC		610 V, 13,700 DHT, 320 A
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JAPAN	Asia Oil Co. Ltd., Hakodate	23,750		1,170 C	1,350 V, 2,700 DHD
	Sakaide	60,000	8,000 FCC		40,000 V, 14,000 DHD, 15,000 RHD
	Yokohama	95,000	.....	12,600 C	1,260 V, 6,300 DHC, 11,700 DHD
	Daikyo Oil Co. Ltd., Yokkaichi	185,250	18,000 FCC 3,150 HD	8,100 C	79,325 V, 3,600 DHT, 37,800 DHD, 31,500 RHD, 4,300 L, 5,490 A
	Fuji Kosan Co. Ltd., Kainan	77,600	.....	.....	44,000 V, 9,000 DHT, 20,000 DHD, 13,600 L, 17,500 A
	Fuji Oil Co. Ltd., Chiba	133,000	.....	5,850 C	30,150 V, 23,850 DHD, 20,700 RHD
	General Sekiyu Seisei KK, Kawasaki	52,700	.....	4,750 C	15,200 DHT
	Sakai	116,400	.....	24,250 C	50,300 V, 74,300 DHT, 29,450 DHD
	Idemitsu Kosan Co. Ltd., Chiba	310,000	25,000 FCC	35,000 C	60,000 V, 53,500 DHT, 38,000 DHD, 40,000 RHD, 5,753 L
	Hyogo	110,000	.....	15,000 C	22,000 DHT, 25,000 DHD, 40,000 RHD
	Tokuyama	140,000	15,000 FCC	15,000 C	20,000 V, 15,000 DHT, 30,000 DHD, 976 A
	Kansai Oil Co. Ltd., Sakai	110,000	.....	5,000 C	34,000 V, 20,000 DHT, 20,000 DHD
	Kashima Oil Co. Ltd., Kashima	180,000	14,000 FCC	6,000 C	25,000 V, 25,000 DHD, 45,000 RHD
	Koa Oil Co. Ltd., Marifu	141,550	13,500 Ck 14,000 FCC	11,520 C	45,000 V, 12,600 DHT, 2,250 DHC, 7,200 DHD, 225 C
	Osaka	76,000	14,400 FCC	8,100 C	49,500 V, 6,300 DHT, 10,800 DHD
	Kyokuto Petroleum Industries Ltd., Chiba	99,000	.....	5,000 C	67,000 V, 7,000 DHT, 67,000 DHD
	Kyushu Oil Co., Ohita	95,000	.....	8,100 C	22,500 V, 14,400 DHT, 12,600 DHD
	Maruzen Oil Co. Ltd., Chiba	195,000	20,000 FCC	25,000 C	65,000 V, 45,000 DHD, 35,000 RHD, 490 A
	Matsuyama	50,000	.....	3,500 C	12,000 DHD
	Shimotsu	37,500	6,500 FCC	7,000 C	14,460 V, 2,300 DHT, 4,500 DHD, 1,660 L, 920 A

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
JAPAN—Continued	Mitsubishi Oil Co., Kawasaki	99,750	.....	10,800 C	8,170 V, 20,250 DHT, 1,043 A
	Mizushima	161,500	18,000 FCC	25,830 C	92,150 V, 71,640 DHT, 38,250 DHD, 1,800 P, 2,641 L, 2,086 A
	Nichimo Sekiyu Seisei KK, Kawasaki	54,150	.....	5,400 C	19,800 V, 2,160 DHT, 9,000 DHD, 14,400 RHD
	Nihonkai Oil Co. Ltd., Toyama City	30,000	.....	.....	.....
	Nippon Mining Co., Funakawa	13,735	.....	.....	1,746 V, 665 L, 750 A
	Mizushima	175,680	.....	20,700 C	27,000 V, 73,170 DHT, 2,700 DHC, 27,900 RHD, 3,450 L, 3,450 A
	Nippon Oil Co. Ltd., Niigata	24,700	.....	4,590 C	1,900 V, 14,850 DHT, 540 L, 396 A
	Nippon Petroleum Refining Co. Ltd., Kudamatsu	39,900	.....	4,680 C	4,275 V, 7,290 DHT, 360 L, 1,305 A
	Muroran	9,500	.....	.....	.....
	Negishi	313,500	18,000 FCC	27,900 C	135,850 V, 88,110 DHT, 61,200 DHD, 3,105 L, 6,210 A
	Yokohama	66,500	5,040 FCC	2,970 C	23,750 V, 9,540 DHT, 1,341 L, 3,357 A
	Seibu Sekiyu KK, Onoda	47,000	.....	6,000 C	26,000 DHT, 9,000 DHD
	Showa Sekiyu KK, Kawasaki	140,000	.....	20,000 C	20,000 DHT, 42,000 DHD
	Niigata	42,000	.....	4,000 C	11,000 DHT, 2,000 DHD
	Showa Yokkaichi Sekiyu KK, Yokkaichi	170,000	15,000 C	32,000 C	32,000 DHT, 33,000 DHD
	Taiyo Oil Co. Ltd., Kikuma	56,050	.....	4,500 C	3,600 V
	Teiseki Topping Plant Co., Kubiki	3,895	.....	.....	.....
	Toa Nenryo Kogyo KK, Kawasaki	190,000	36,000 FCC	.....	110,700 V, 69,300 DHT, 54,000 DHD, 520 A
	Shimizu	41,300	.....	4,140 C	3,420 V, 13,140 DHT, 190 L, 950 A
	Wakayama	177,700	20,970 FCC	32,400 C	71,550 V, 85,800 DHT, 22,500 DHD, 1,130 Alky, 5,930 L, 3,160 A
	Toa Oil Co. Ltd., Kawasaki	95,000	.....	9,900 C	12,600 DHD
	Toho Oil Co. Ltd., Owase City	38,000	.....	.....	.....
	Tohoku Oil Co., Sendai	38,000	.....	5,400 C	12,600 DHT
	Total	4,315,610	251,060 C 13,500 T	422,150 C	
JORDAN	Jordan Petroleum Refinery Co. Ltd., Zerqa	14,774	2,480 FCC	780 C	3,980 V, 1,340 DHT, 490 A
KENYA	East African Oil Refineries Ltd., Mombasa	48,000	.....	4,000 C	16,000 DHT
KOREA	Honam Oil Refinery Co. Ltd., Yosu	160,000	.....	7,100 C	11,400 DHT, 2,100 A
	Korea Oil Corp., Ulsan	215,000	7,460 C	16,150 C	3,450 V, 28,370 DHT, 1,980 A
	Kyung In Energy Co. Ltd., Inchon	55,000	.....	2,700 C	6,700 DHT
	Total	430,000	7,460 C	25,950	
KUWAIT	American Independent Oil Co., Mena Abdulla	132,000	.....	.....	112,000 V, 32,000 RHD
	Arabian Oil Co. Ltd. (Japan), Ras Al Khafji	30,000	.....	.....	.....
	Getly Oil Co., Mina Saud	50,000	5,000 Ck	.....	.....
	Kuwait National Petroleum Co., Shuaiba	135,000	.....	15,000 C	70,000 V, 95,000 DHT, 14,000 DHC, 37,000 RHC
	Kuwait Oil Co. Ltd., Mina al Ahmadi	300,000	6,000 C	.....	915 A
	Total	647,000	6,000 C 5,000 T	15,000 C	
LEBANON	Iraq Petroleum Co. Ltd., Tripoli	36,000	.....	4,400 C	6,730 DHT, 900 A
	Mediterranean Refining Co., Sidon	17,500	.....	2,900 C	2,900 DHT
	Total	53,500		7,300 C	
LIBERIA	Liberia Refining Co., Gardnersville	12,500	.....	2,000 C	1,000 V, 1,000 DHT
LIBYA	American Overseas Petroleum Ltd., Nafuora	1,800	.....	.....	.....
	Fsso Standard Libya, Marsa el Brega	9,025	.....	1,980 C	2,880 DHT
	Mobil Oil Libya Ltd., Amal	1,800	.....	.....	.....
	Occidental of Libya Inc., Intisar	1,800	.....	.....	.....
	Zeutina	3,000	.....	.....	300 A
	Total	17,425		1,980 C	
MALAGASY	Societe Malgache de Raffinage, Tamatave	14,600	.....	2,300 C	5,200 DHD

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
MALAYSIA	Esso Standard Malaya Berhad, Port Dickson ..	32,200	.....	3,700 C	2,800 V, 12,780 DHT, 6,400 DHD, 1,100 A
	Shell Refining Co. Berhad, Port Dickson	31,000	.....	2,000 C	8,000 DHT, 4,000 DHS
	Total	63,200	.....	5,700 C	
MARTINIQUE	Societe Anonyme de la Raffinerie des Antilles (SARA), Fort-de-France	11,000	.....	2,120 C	3,400 DHT, 2,300 DHD
MEXICO	Petroleos Mexicanos: Atzacapotzalco	100,000	20,000 Vis 23,000 FCC	26,000 C	50,000 V, 3,000 Alky, 650 P
	Ciudad Madero	169,000	8,000 Vis 23,000 FCC	19,000 C	78,000 V, 18,000 DHT, 15,000 DHD, 3,000 Alky, 650 Poly, 400 C, 16,000 A
	Minatitlan	208,000	24,000 FCC 21,000 TCC	29,300 C	60,000 V, 21,000 DHT, 29,000 DHD, 600 P, 3,000 L
	Poza Rica	27,000	.....	5,000 C	.....
	Reynosa	20,500	.....	.....	.....
	Salamanca	100,000	4,000 T 18,000 TCC	8,000 C	51,200 V, 17,600 DHT, 18,500 RHC, 28,000 DHD 7,100 L, 3,000 A
	Total	624,500	109,000 C 32,000 T	87,300 C	
MOROCCO	Societe Cherifienne des Petroles, Sidi-Kacem ..	8,550	3,600 TCC	1,080 C	1,080 DHT
	Societa Am. Marocaine Italienne de Raffinage (Samir), Mohammedia	50,000	.....	6,500 C	9,100 DHT
	Total	58,550	3,600 C	7,580 C	
MOZAMBIQUE	Sociedade Nacional de Refinacao de Petróleos (Sonarep), Salazar	17,000	.....	2,500 C	5,000 V, 2,500 DHT, 1,000 A
NETHERLANDS	BP Raffinaderij Nederland NV, Rotterdam ..	475,020	.....	18,920 C	160,160 DHT, 18,200 DHD
	Chevron Petroleum Maatschappij Nederland NV, Pernis	300,000	.....	39,000 C	25,000 V, 39,000 DHT, 38,000 DHD, 5,000 A
	Esso Nederland NV, Rotterdam	325,000	.....	43,800 C	128,800 DHT
	Gulf Oil Raffinaderij NV, Rozenburg	94,000	8,600 T	7,350 C	31,000 V, 31,350 DHT, 2,850 L, 4,200 A
	Mobil Oil NV, Amsterdam	125,000	.....	24,000 C	36,500 DHT, 29,000 DHD
	NV Smid & Hollander, Amsterdam	6,500	.....	.....	6,500 V, 6,400 A
	Shell Nederland Raffinaderij NV, Rotterdam ..	500,000	75,000 Vis	26,000 C	96,000 DHT, 55,000 DHD
	Total	1,825,520	83,600 T	158,770 C	
NETHERLANDS ANTILLES	Lago Oil & Transport Co. Ltd., Aruba	520,000	280,000 Vis 40,000 FCC	.....	130,000 V, 77,000 DHT, 70,000 DHD, 7,800 Alky, 3,100 Isom
	Shell Curacao NV, Emmastad	360,000	100,000 Vis 35,000 C	15,000 C 7,000 T	52,000 DHT, 25,000 DHD
	Total	880,000	75,000 C 380,000 T	15,000 C 7,000 T	
NEW ZEALAND	New Zealand Refining Co. Ltd., Marsden Point, Whangarei	54,000	.....	18,000 C	32,000 DHT, 5,000 DHD
NICARAGUA	Refinería Esso Managua, Managua	13,200	.....	2,600 C	1,900 V, 10,600 DHT, 730 A
NIGERIA	Nigerian Petroleum Refining Co. Ltd., Alesa Eleme, Port Harcourt	60,000	.....	5,700 C	.....
NORWAY	A/S Norske Esso, Slagen, Tonsberg	110,000	.....	8,500 C	18,000 DHT, 8,100 DHD
	Valloy, Tonsberg	3,000	.....	.....	2,100 V, 700 DHT, 700 L, 2,400 A
	A/S Norske Shell, Solo	60,000	24,000 Vis	10,000 C	14,000 DHT, 8,000 DHD
	Total	173,000	24,000 T	18,500 C	
OKINAWA	Gulf Sekiyu Seisei Co. Ltd., Henza	92,500	.....	.....	17,900 DHT, 50,100 DHD
	Nansei Sekiyu, Nishihara	93,000	.....	10,000 C	36,300 DHT
	Toyo Petroleum Refining Co. Ltd., Naha	25,000	.....	.....	.....
	Total	210,500	.....	10,000 C	
PAKISTAN	Attock Oil Company Ltd., Rawalpindi	11,640	.....	.....	1,200 V, 350 L, 13,000 A
	National Refinery Ltd., Korangi	13,850	.....	.....	5,250 V, 1,550 DHT, 1,550 L, 1,650 A

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
PAKISTAN—Continued	Pakistan Refinery Ltd., Korangi	55,000	.....	2,500 C	21,000 DHT, 217 A
	Total	80,490	.....	2,500 C	
PANAMA	Refinería Panamá SA, Las Minas, Colon	75,000	19,000 Vis	7,500 C	14,000 V, 30,000 DHT, 5,000 A
PARAGUAY	Refinería Paraguaya SA, Villa Elisa	5,000	.....	.....	210 A
PERU	Compañía de Petróleo Ganso Azul Ltda., Pucallpa	2,375	.....	.....	.....
	Petróleos del Perú, Iquitos	1,100	.....	.....	.....
	La Pampilla	30,000	6,670 FCC	1,760 C	9,360 V, 2,700 DHT
	Talara	60,000	16,000 T	.....	1,000 L, 2,000 A
	Refinería Conchán Chevron SA (en administra- ción judicial), Miraflores, Lima	8,000	.....	.....	3,000 V, 3,000 A
	Total	101,475	6,670 C 16,000 T	1,760 C	
PHILIPPINES	Bataan Refining Corp., Limay	103,500	14,492 TCC	20,713 C	21,204 V, 59,496 DHT
	Caltex Philippines Inc., Batangas	72,000	11,400 FCC	8,600 C	18,100 V, 15,200 DHT, 900 Poly, 3,500 SD
	Filoil Refinery Corp., Rosario	33,800	.....	4,600 C	8,500 V, 9,090 HDS, 800 A
	Shell Philippines Inc., Batangas	67,000	.....	8,000 C	12,000 DHT, 6,000 DHD
	Total	276,300	25,392 C	41,913 C	
POLAND	Glinik Mariampolski	2,470	.....	.....	.....
	Jasto	2,660	.....	.....	.....
	Jedlicze	3,800	.....	.....	.....
	L. Warynski, Czechowice	13,300	.....	.....	.....
	Mazovia, Plock	114,000	13,500 C 9,000 T 9,000 Ck	10,800 C	54,000 V, 16,200 DHD, 2,520 L, 5,400 A
	Trzebinia	9,500	.....	.....	.....
	Total	145,730	13,500 C 18,000 T	10,800 C	
PORTUGAL	Sacor, Cabo Ruivo, Lisbon	35,150	9,000 TCC	.....	5,400 DHD, 477 P, 315 A
	Boa Nova, Porto	44,650	14,400 T	9,900 C	9,900 V, 18,450 DHT, 891 DHD, 2,790 L, 684 A
	Total	79,800	9,000 C 14,400 T	9,900 C	
PUERTO RICO	Caribbean Gulf Refining Co., Bayamón	40,000	8,500 FCC	6,000 C	15,000 V, 6,600 DHT, 11,000 DHD, 500 Poly, 1,000 A
	Commonwealth Oil Refining Co. Inc., Peñuelas	185,000	40,000 C 22,000 Vis	70,000 C	65,000 V, 88,000 DHT, 6,000 Alky, 4,200 Poly
	Yabucoa Sun Oil Co., Yabucoa	66,000	.....	.....	35,000 V, 14,000 DHT, 11,200 DHC, 8,300 DHD, 5,400 L
	Total	291,000	48,500 C 22,000 T	76,000 C	
QATAR	National Oil Distribution Co., Umm Said	680	.....	.....	.....
RHODESIA	Central African Petroleum Refineries Pvt. Ltd., Umtali	20,000	(Not in operation: not included in total.)		
ROMANIA	Brazi	76,000	.....	.....	2,025 DHT
	Pitesti	57,000	.....	.....	86,400 DHT, 15,570 L
	Sulpacu Barcau (Crisana oil field)	5,700	.....	.....	.....
	Total crude capacity for all refineries: 320,000 b/cd. Other refineries at Borzetsi, Brazov, Cimpina, Darmanesti, G. Gheorghiu Dej—Onesti, Ploiesti, Teleajen.				
SAUDI ARABIA	Arabian American Oil Co., Ras Tanura	415,000	.....	12,800 T 13,800 C	100,000 V, 22,800 DHD, 3,500 A
	Jeddah Oil Refinery Co., Jeddah	13,270	.....	2,650 C	1,380 V, 2,650 DHT, 3,750 DHD, 390 A
	Total	428,270	.....	16,450 C 12,800 T	
SENEGAL	Société Africaine de Raffinage (SAR), Dakar	12,000	.....	2,000 C	2,000 DHT
SIERRA LEONE	Sierra Leone Petroleum Refining Co. Ltd., Freetown	10,000	.....	.....	.....

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
SINGAPORE	BP Refinery Singapore Pte. Ltd., Pasir Panjang	24,570	.....	.....	.....
	Esso Singapore Private Ltd., Pulau Ayer Chawan	88,000	.....	5,400 C	7,200 V, 30,800 DHT, 12,600 DHD, 6,800 A
	Mobil Oil Singapore Pty. Ltd., Jurong	27,600	.....	4,000 C	13,000 DHD
	Shell Eastern Petroleum Pte. Ltd., Pulau Bukom	250,000	.....	10,000 C	60,000 DHT, 20,000 DHD
	Total	390,170	.....	19,400 C	.....
SOUTH AFRICA	Caltex Oil (S.A.) (Pty.) Ltd., Cape Town	46,000	9,500 Vis 10,400 FCC	.....	21,000 V, 30,500 DHT, 900 A
	Mobil Refining Co. South Africa Pty. Ltd., Durban	60,000	14,500 FCC	7,000 C	22,000 V, 7,500 DHT, 12,500 DHD, 300 Poly, 2,000 A
	National Petroleum Refiners of South Africa (Pty.) Ltd., Sasolburg	50,000	14,000 FCC	9,600 C	18,000 V, 8,700 DHT, 9,400 DHC, 6,200 DHD, 4,300 Alky, 430 A
	Shell & BP South African Petroleum Refineries Pty. Ltd., Durban	84,000	17,000 C	30,000 C	55,000 DHD
	South African Torbanite Mining and Refining Co. Ltd., Boksburg North	2,600	650 T	.....	515 A
	Total	242,600	55,900 C 10,150 T	46,600	.....
SOUTH YEMEN	BP Refinery (Aden) Ltd., Aden	160,160	.....	8,600 C	2,730 DHD
SPAIN	Asfaltos Españoles SA (Asesa), Tarragona	18,000	.....	.....	15,000 V, 11,700 A
	Cia. Española de Petróleos (Cepsa), Algeciras, Cádiz	85,500	.....	18,450 C 22,680 T	30,800 V, 26,280 DHT, 8,820 DHC
	Santa Cruz de Tenerife, Canary Islands	167,200	.....	18,000 C	10,620 V, 13,500 DHT, 10,800 DHD, 1,170 L, 6,300 A
	Cia. Ibérica Refinadora de Petróleos SA (Petroiber), La Coruña	114,000	16,200 Vis	14,850 C	14,850 DHT
	Empresa Nacional Calvo Sotelo, Puertollano	120,000	.....	6,800 C	5,000 V, 5,200 DHD, 2,000 L
	Esso Petróleos Espanoles SA, Castellón de la Plana	72,000	.....	7,000 C	30,000 DHT, 6,000 DHD
	Refinería de Petróleos de Escombreras SA, Escombreras	209,000	.....	21,150 C	12,150 V, 13,500 DHT, 18,000 DHC, 23,400 DHD, 1,350 P, 2,790 L
	Refinería de Petróleos del Norte SA (Petronor), Somorrostro, Bilbao	160,000	.....	16,000 C	23,000 DHT, 18,000 DHD
	Río Gulf de Petróleos SA, Huelva	80,000	.....	5,000 C	7,600 V, 13,000 DHT, 2,900 A
	Total	1,025,700	16,200 T	107,250 C 22,680 T	.....
SUDAN	Shell & BP Sudan Ltd., Port Sudan	20,000	.....	2,000 C	9,000 DHT
SWEDEN	AB Nynas-Petroleum, Gothenburg	5,700	.....	.....	4,500 V, 900 A
	Malmö	3,800	.....	.....	.....
	Nynasham	28,500	.....	6,300 C	4,500 V
	BP Raffinaderi, Gothenburg	105,560	.....	21,070 C	36,400 DHT
	Koppartrans Olje AB (Shell), Gothenburg	100,000	33,000 Vis	17,000 C	27,000 DHT, 14,000 DHD
	Total	243,560	33,000 T	44,370 C	.....
SWITZERLAND	Raffinerie de Cressier SA, Cressier	50,000	21,000 Vis	10,000 C	17,000 DHT, 8,000 DHD
	Raffinerie du Sud-Ouest SA, Collombey-Muraz	70,000	.....	10,000 C	17,400 DHT
	Total	120,000	21,000 T	20,000 C	.....
SYRIA	General Petroleum Co., Homs	51,300	18,000 Ck	2,160 T	2,880 V, 30,600 DHT, 2,520 A
TAIWAN	Chinese Petroleum Corp., Kaohsiung	199,000	9,040 Ck 9,040 TCC	20,800 C	3,160 V, 22,600 DHD, 810 Alky, 605 P, 2,758 A
TANZANIA	Tiper—Tanzanian and Italian Petroleum Refining Co. Ltd., Dar es Salaam	16,800	.....	4,200 C	5,000 DHD
THAILAND	Defense Energy Department, Bangkok	55,000	10,000 Vis	10,000 C	18,000 DHD, 400 A
	Fang refinery, Chiang Mai	800	.....	.....	700 V, 200 L
	Esso Standard Thailand Ltd., Sriracha	35,000	.....	4,800 C	5,900 V, 13,400 DHT, 4,300 DHD, 3,300 A

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
THAILAND—Continued	Thai Oil Refinery Co. Ltd., Bangkok	65,000	13,000 Vis 7,000 FCC	9,000 C	14,500 V, 32,000 DHT, 10,000 DHD, 1,400 A
	Total	155,800	21,000 T 7,000 C	23,800 C	
TRINIDAD	Shell Trinidad Ltd., Point Fortin	80,000		7,000 C	19,000 DHT
	Texaco Trinidad Inc., Brighton	6,000			
	Pointe-A-Pierre	355,000	26,500 FCC	20,000 C	187,000 V, 45,000 DHT, 80,000 DHD, 1,200 Alk, 350 Poly, 4,000 L
	Total	441,000	26,500 C	27,000 C	
TUNISIA	Societe Tuniso Italienne de Raffinage (STIR), Zarzouna, Bizerte	21,375		2,970	
TURKEY	Anadolu Tasfiyehanesi AS, Mersin	90,000		9,500 C	20,000 DHT, 9,500 DHD
	Istanbul Petrol Refinerisi AS (Ipras), Izmit ..	110,000	19,585 FCC	9,330 C	50,000 V, 11,975 DHT, 18,525 DHD, 10,000 A
	Turkish Petroleum Co., Aliaga-Izmir	62,370		8,881 C	32,225 V, 14,995 DHT, 12,760 DHD, 3120
	Batman	23,625	4,000 TCC	1,228 C	2,000 V, 1,228 DHT, 3,186 A
	Total	285,995	23,585 C	28,988 C	
UNITED KINGDOM	ENGLAND				
	Berry Wiggins & Co., Ltd., Kingsnorth on Medway, Kent	5,890			
	Weaste, Lancashire	3,420			
	BP Refinery Kent Ltd., Isle of Grain	232,960	17,600 Ck 15,840 FCC	38,700 C	62,790 V, 5,400 DHT, 13,650 DHD, 2,728 Alk, 2,800 L
	Burmah-Castrol Co., Ellesmere Port	26,520	1,230 Vis	5,060 C	14,370 V, 6,430 DHT, 6,430 DHD, 6,150 L, 240 A
	Conoco Ltd., Humber Refinery, South Killingholme	80,000	21,000 T 28,000 Ck	22,500 C	86,000 DHD, 670 C
	Esso Petroleum Co. Ltd., Fawley	389,500	76,500 FCC	50,400 C	60,750 V, 225 DHT, 73,800 DHD, 3,150 P, 5,230 L, 4,200 A
	Lindsey Oil Refinery Ltd., Killingholme, Lincolnshire	179,600		27,400 C	14,200 V, 35,000 DHT, 30,500 DHD, 7,100 A
	Mobile Oil Co. Ltd., Coryton, Essex	135,000	9,500 TCC	27,000 C	43,000 V, 33,000 DHT, 34,000 DHD, 5,500 L
	Phillips-Imperial Petroleum Ltd., North Tees ..	100,000			
	Philmac Oils Ltd., Castham, Cheshire	11,000			9,000 V, 7,260 A
	Shell U.K. Ltd., Heysham	39,000			
	Shell Haven	200,000		32,000 C	32,000 DHT, 16,000 DHD
	Stanlow	215,000	50,000 C	14,000 C	14,000 DHT, 13,000 DHD
	Teesport	110,000		15,000 C	31,000 DHT, 14,000 DHD
	Total England	1,727,890	151,840 C 67,830 T	232,060 C	
	NORTH IRELAND				
	BP Refinery Ltd., Belfast	13,850		5,590 C	10,010 DHT, 3,276 DHD
	SCOTLAND				
	BP Refinery Ltd., Grangemouth	182,000	15,840 FCC	20,640 C	77,350 V, 54,600 DHT, 24,900 DHC
	Shell U.K. Ltd., Ardrossan	6,000			
	Total Scotland	188,000	15,840 C	20,640 C	
	WALES				
	BP Refinery Ltd., Llandarcy, Neath	168,350	15,840 FCC	14,190 C	27,300 V, 3,185 DHT, 13,650 DHD, 854 L, 542 A
	Esso Petroleum Co. Ltd., Milford Haven	123,500		20,250 C	18,900 DHD
	Gulf Oil Refining Ltd., Milford Haven	103,000		18,000 C	35,100 DHT
	Texaco Ltd., Pembroke	140,000		17,500 C	10,000 V, 41,000 DHT
	Total Wales	534,850	15,840 C	69,940 C	
	Total United Kingdom	2,464,590	183,520 C 67,830 T	328,230 C	
URUGUAY	Administracion Nacional de Combustibles Alcohol y Portland (Ancap), La Teja, Montevideo	40,000	4,000 FCC	2,000 C	12,000 V, 7,000 DHD, 4,100 A
VENEZUELA	Chevron Oil Co. de Venezuela, Bajo Grande ..	61,500			15,300 V, 7,000 A
	Cia Shell de Venezuela Ltd., Cardon	348,000	32,000 C 94,000 T		44,000 DHT, 32,000 DHD

WORLDWIDE REFINING	Company and refinery location	Crude	Cracking	Reforming	Other processing
VENEZUELA—Continued	San Lorenzo	32,000	.....	.....	.....
	Corporación Venezolana del Petróleo, Morón,	.....	.....	.....	.....
	Estado Carabobo	25,000	.....	1,800 C	1,200 V, 720 A
	Creole Petroleum Corp., Amuay Bay	630,000	13,000 FCC	.....	366,000 V, 17,500 DHT, 219,000 DHD, 1,400 L, 15,200 A
	Caripito	84,000	.....	.....	.....
	Mobil Oil de Venezuela, El Palito	102,000	.....	7,000 C	7,000 DHT
	Phillips Petroleum Co., San Roque	4,600	.....	.....	.....
	Sinclair Venezuelan Oil Co., Guanta,	.....	.....	.....	.....
	Puerto la Cruz	37,525	.....	.....	.....
	San Silvestre, Barinas	5,400	.....	.....	.....
	Texas Petroleum Co., Tucupita	10,000	.....	.....	.....
	Venezuela Gulf Refining Co., Puerto la Cruz	159,000	16,000 Vis 15,000 FCC	.....	2,400 Alky
	Total	1,499,025	60,000 C 110,000 T	8,800 C	.....
VIRGIN ISLANDS	Amerada Hess Corp., St. Croix	418,000	.....	13,500 C	45,000 V, 28,800 DHT, 48,600 DHD
YUGOSLAVIA	Government, Bosanski Brod	53,982	.....	5,861 C	1,200 V, 945 MC, 666 A
	Lendava	4,218	.....	.....	.....
	Novi Sad	12,654	.....	.....	.....
	Pancevo	29,878	14,652 T	3,996 C	8,793 DHD
	Rijeka	96,135	7,459 T	13,720 C	4,662 DHD, 4,000 L, 866 A
	Sisak	76,627	5,328 T 2,997 C	2,664 C	2,464 DHD, 1,000 A
	Note: Lube-oil manufacture is combined total of 3,330 b/sd for all refineries except Rijeka.				
ZAIRE	Societe Zairo-Italienne de Raffinage (Soziri), Muanda	16,150	.....	2,850 C	4,750 DHD

Worldwide production

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
ABU DHABI	Murban, Bab & Bu Hasa, 1960	8,500	53	.....	24	595,267	1,624,562,647	39.2
	Umm Shaif, 1958*	9,150	24	.....	11	121,904	307,267,940	37.5
	Zakum, 1964*	9,100	38	.....	6	226,224	311,238,841	40.5
	Total	.....	115	.....	41	943,395	1,643,064,428	.....
	*Offshore Note: Japanese-owned Mubarras field to go on stream in March, 1973							
AFGHAN- ISTAN*	Angot, 1950	2,100	.....	.....	.....	5	15,475	.....
	Hodja-Gugerdag, 1961†	5,400	10	.....	.....	126	.....	51.0
	Khuiaja-Borhan, 1964†	4,170-4,700	1	.....	.....	.....	.....	51.0
	Sari-pul, 1959	5,000	.....	2	.....	30	15,900	28.0
	Yatim Tagh, 1950†	1,290-4,019	2	.....	.....	.....	.....	51.0
	Total	.....	13	13	.....	161	72,375	.....
	†Gas-condensate *Data are estimates							
ALGERIA*	ALREP	.....	.....	.....	.....	.....	.....	.....
	Haoud Berkauui, 1965	10,300	7	.....	.....	28,230	58,462,694	46.0
	Hassi Messaoud North, 1956	11,000	77	.....	11	185,800	608,837,180	49.0
	C.P.A.	.....	.....	.....	.....	.....	.....	.....
	Gassi Touil, E., 1966	6,100	2	.....	.....	1,100	3,896,887	44.0
	CREPS	.....	.....	.....	.....	.....	.....	.....
	Achob, 1963	7,900	7	.....	2	2,260	9,219,751	43.0
	Edjeleh, 1956	1,900-3,000	100	.....	86	18,690	137,306,322	36.0
	El Adeb Larache, 1958	3,900	3	.....	28	4,280	30,273,927	45.0
	Hassi Mazoula, So., 1962	4,400	.....	.....	6	2,790	10,408,620	49.0
	Ohanel, So., 1960	7,900	4	.....	5	9,050	15,148,112	43.0
	Ohanel, No., 1960	7,900	10	.....	10	6,590	48,177,918	44.0
	Tiguentourine, 1956	2,000-3,600	4	.....	54	4,080	36,317,944	45.0
	Tin Fouye No. & So., 1965	4,500	.....	.....	40	16,240	128,408,735	40.0
	Zarzaitaine, 1958	3,200-4,600	12	.....	124	41,770	436,657,725	42.0
	Others	.....	9	.....	.....	3,340	10,939,017	.....
	PETRAL	.....	.....	.....	.....	.....	.....	.....
	Askarene, 1962	8,000	5	.....	3	3,200	13,772,744	40.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
ALGERIA—Continued	Gassi Touil, 1963	6,100	19	....	26	48,710	159,762,143	44.0
	Guelta, 1962	8,900	4	....	2	2,790	14,468,031	41.0
	REPAL							
	Hassi Messaoud, S., 1956	11,000	122	....	9	239,070	817,527,236	47.0
	Nezla E. & No., 1965	8,500	4	....	1	7,190	14,242,539	48.0
	SEPAL							
	El Gassi El Agreb, 1959	10,500	20	....	1	35,140	127,770,526	48.0
	SONATRACH							
	Djebel Onk, 1960	3,900	....	1	1	860	1,260,456	37.0
	Djoua W., 1966	5,500	2	....	4	1,220	4,222,875	40.0
	El Borma, 1967	8,500	8	....	....	21,890	114,023,764	41.1
	Rhourde el Baguel, 1962	9,500	16	....	1	55,130	208,959,715	41.0
	Timedratine E., 1966	7,870	2	....	....	1,000	3,177,030	38.0
	Tin Fouye Tabankort, 1966	4,500- 6,700	23	10	....	27,470	29,233,354	40.0-42.0
	Rhourde Nouss, 1963	8,900	4	....	2	3,080	9,547,634	39.0
	Others		28	18	4	1,280	12,110,595	
	Total		492	32	420	772,260	3,064,134,074	
	*Data are estimated							
ANGOLA	ANGOLA PROPER:							
	Mulenvos, 1966	6,500	1	7	2	1,068	2,338,669	25.0
	Quenguela Norte, 1968	4,900- 6,200	33	....	8	9,360	14,546,740	29.0
	Others	2,100- 8,000	14	3	17	687	32,303,495	29.0-33.0
	Sub-total		48	10	27	11,115	49,188,904	
	CABINDA							
	Malongo N., 1966*	1,500- 8,500	46	0	5	52,164	58,728,240	25.0-37.0
	Malongo, S., 1966*	1,300- 1,500	25	0	1	14,466	19,157,967	23.0-26.0
	Malongo, W., 1969*	1,800- 8,750	30	0	7	55,932	24,695,561	22.0-23.0
	61-1, 1968	5,900	2	0	0	206	551,378	23.0
	Sub-total		103	0	13	122,768	103,133,146	
	Total		151	10	40	133,883	152,322,050	
	*Offshore							
ARGENTINA*	Chubut, 1907	2,500- 6,000	25	1,200	200	70,833	520,008,545	22.8-24.5
	Jujuy, 1969	11,000-15,000	20	....	....	30,870	6,492,240	32.0
	La Pampa, 1968	5,000- 5,500	17	....	....	12,201	7,452,475	....
	Mendoza, 1943	7,500- 8,000	4	800	30	116,445	383,508,850	....
	Neuquen, 1918	3,000- 6,000	50	300	50	52,815	148,810,170	30.0
	Rio Negro, 1960	2,800- 6,000	200	250	110	68,439	114,117,235	....
	Salta, 1930	11,000-15,000	60	15	140	6,090	121,835,850	22.5-54.0
	Santa Cruz, 1944	4,000- 6,000	240	2,100	365	77,427	593,254,855	41.8
	Tierra del Fuego, 1952	6,000- 7,000	5	25	10	6,300	40,697,500	41.0
	Total		621	4,690	905	441,420	1,936,177,720	
	*Data are estimated							
AUSTRALIA	Alton, 1964	6,000	....	5	1	310	1,483,643	52
	Barracouta, 1968*	4,500	5	....	....	6,375	5,574,842	63
	Barrow Island, 1964*	2,200- 6,700	159	164	13	42,580	59,953,640	7
	Halibut, 1967*	7,500	21	....	....	118,292	129,394,803	43
	Kingfish, 1967*	8,450	42	....	....	135,093	53,875,055	47
	Moonie, 1961	5,800	1	1	4	1,837	16,377,380	44
	Total		228	170	18	304,487	276,659,363	
	*Offshore							
AUSTRIA	VIENNA BASIN							
	Matzen, 1949	4,200- 7,200	59	731	152	23,089	288,260,369	25.7
	Muehlberg, 1942	3,900- 5,500	9	54	21	963	35,503,938	35.0
	Pirawarth, 1957	2,400- 4,200	8	44	4	2,139	4,251,450	28.4
	St. Ulrich, 1938	2,900- 4,100	3	119	158	1,403	35,629,529	33.0
	Schoenkirchen (incl. Prottes + Strasshof Tiet)	7,800- 9,600	13	3	1	9,824	34,450,571	31.1
	Gaiselberg, 1938	3,400- 6,500	1	39	18	1,285	27,223,051	24.8
	Others	....	....	122	48	1,215	....	....
	MOLASSE ZONE							
	Piberbach, 1968	3,500	....	7	....	987	1,129,643	39.0
	Voitsdorf, 1962	6,800	4	17	3	3,549	12,363,456	35.8
	Others		2	35	7	2,152	7,041,506	....
	Total		99	1,171	412	46,606	493,917,340	
BAHRAIN	Awali, 1932	1,850- 4,600	195	41	3	72,640	518,881,000	33.0
BOLIVIA	Camiri, 1927	3,936	16	47	....	2,268	412,742	55.0
	Caranda, 1960	2,296	6	14	....	1,551	282,580	52.0
	Colpa, 1961	8,200- 9,500	27	....	....	4,087	745,258	42.0-46.0
	La Pena, 1965	8,100-11,200	18	....	....	4,290	778,670	42.0
	Monteagudo, 1966	5,576	24	1	....	9,404	1,710,627	59.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
BOLIVIA—Continued	Rid Grande, 1961	9,000	16	....	....	7,994	1,456,821	62.0-65.0
	Tatarenda, 1962	2,296	6	14	....	1,551	282,580	52.0
	Others		2	44	....	816	148,433	....
	Total		115	120	....	31,961	5,817,711	
BRAZIL	Agua Grande, 1951	3,281-6,562	47	47	70	23,801	207,642,009	38.0-42.0
	Aracas, 1965	3,281-6,562	11	55	31	26,384	32,065,249	41.0
	Buracica, 1959	2,395-2,559	....	85	6	19,141	67,225,845	35.0
	Candeias, 1941	3,281-6,562	15	26	92	6,238	59,631,661	30.0-31.0
	Carmopolis, 1963	2,460	....	179	8	19,788	39,549,497	24.0
	Cassarongongo, 1959	4,757	....	20	5	3,194	4,900,909	32.0
	Dom Joao, 1947	918	....	373	122	11,605	52,097,409	38.0
	Boa Esperenca, 1956	7,874-8,530	4	3	2	2,211	3,941,419	38.0-40.0
	Imbe, 1964	2,132-8,202	5	17	4	2,325	4,991,830	38.0-42.0
	Miranga, 1965	3,281-6,562	53	61	27	32,218	81,912,014	39.0-41.0
	Plataforma Continental, 1958*	4,085-8,750	....	....	4*	....	175,713	43.0
	Riachuelo, 1961	1,476	....	37	20	2,211	2,997,597	28.0
	Siririzinho, 1967	1,640	....	69	14	5,374	7,574,534	30.0
	Taquipe, 1959	3,117-3,937	14	49	15	8,574	50,032,710	40.0
	Others		7	36	96	4,549	20,096,117	....
	Total		156	1,057	516	167,613	634,834,513	
	*Two offshore fields have been found—Guaricema and Ciaoba—not yet producing.							
BRUNEI-MALAYSIA	Ampa, S.W., 1963*	7,068-8,155	59	25	25	110,073	158,760,800	41.0
	Bakau, 1971*	....	1	....	....	2,966	340,000	39.0
	Baram, 1967*	9,500	15	9	....	37,622	17,684,400	40.5
	Baronia, 1970*	11,000	1	....	4	1,278	116,300	42.0
	Champion, 1970*	4,300	8	....	3	14,389	1,450,700	20.0
	Fairley, 1969*	10,740	3	4	....	7,820	4,841,600	42.0
	Jerudong, 1968	....	....	....	2	....	636,800	39.0
	Mini, 1911†	300-3,000	....	70	12	374	79,703,500	27.0
	Seria, 1928	834-10,450	....	344	182	45,689	792,374,400	36.0
	West Lutong, 1965*	6,800	19	....	....	52,346	33,707,700	39.5
	Total		106	452	228	272,557	1,089,616,200	
	*Offshore.							
	†Field abandoned Nov., 1972.							
BURMA*	Chauk-Lanywa, 1902	3,500	2	290	....	2,100	148,400,750	
	Mann, 1970	3,955-6,934	16	4	....	6,000		
	Myanaung, 1965	....	88	....	....	6,800		
	Prome, ?	....	40	....	....	2,150		
	Yenangyaung, 1902	5,000	20	235	....	4,500		
	Total		156	529	....	21,550		
	*Data estimated.							
CHILE	MAINLAND							
	Canadon, 1962	6,560	23	6	17	2,843	8,877,424	38.0
	Daniel, 1960	5,975	56	15	34	6,126	24,327,846	32.0
	Daniel Este, 1961	5,740	23	5	10	4,761	16,203,688	32.0
	Posesion, 1960	6,100	35	....	3	4,466	12,688,269	63.0
	TIERRA DEL FUEGO							
	Calafate, 1955	6,200	23	5	25	5,265	15,389,914	49.0-60.0
	Catalina Sur, 1962	5,890	19	7	18	925	5,083,121	43.0
	Cullen, 1954	5,840	44	16	33	3,101	33,064,862	41.0
	Tres Lagos, 1957	5,640	22	1	28	1,780	9,446,651	40.0
	Others		51	23	48	3,151	53,990,926	....
	Total		296	78	216	32,418	179,072,701	
CANADA	ALBERTA				Production in bbl		Gravity °API	
		Name of field and discovery date	Depth (ft)	No. of wells capable of production	Daily avg. 1st 6 mos. 1972	Cumulative 7/1/72		
		Acheson, 1950	4,600-5,100	63	10,974	52,000,397	33.0-40.0	
		Ban Try, 1948	2,500-3,265	113	4,519	16,818,227	24.0	
		Bellshill Lake, 1955	3,000	101	4,594	14,285,799	26.0	
		Bonnie Glen, 1958	3,950-7,000	72	46,408	163,530,600	34.0-42.0	
		Carson Creek, North, 1958	8,650-8,750	28	17,983	32,613,550	43.0	
		Cessford, 1950	2,813-3,395	80	2,685	10,695,310	24.0-28.0	
		Clive, 1951	6,150	69	5,754	13,278,282	40.0-41.0	
		Countess, 1951	2,858-3,570	47	4,492	4,599,412	29.0	
		Crossfield, 1959	6,650	70	1,441	13,732,268	36.0-37.0	
		Erskine, 1952	5,400	63	1,839	16,204,071	22.0-28.0	
		Excelsior, 1949	3,900	13	2,024	14,896,362	37.0	

This was a bad trip



Shale-Trol™, a new Milchem product, stops expensive downtime situations resulting from bit balling and flowline plugging encountered while drilling "gumbo" or "sticky" shales. It is compatible with all fresh, sea, and saltwater mud systems. Shale-Trol has been field-tested and proven to provide trouble-free drilling of sticky shales.

Shale-Trol eliminates bit balling and plugged flowline situations to provide real benefits like:

- more on-bottom rotating hours
- reduced control drilling in gumbo
- minimized sticking, swabbing, and drag
- fewer loss of circulation problems
- less trip time

Shale-Trol saves operational time and decreases drilling cost.

Shale-Trol is adsorbed on the drill solids by a process* which provides a highly non-dispersive environment. Under these conditions, the gumbo cuttings are carried from the hole primarily as individual particles.

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Drilling Fluids and Drilling Controls

AGO 530140

* Pat. Pend.



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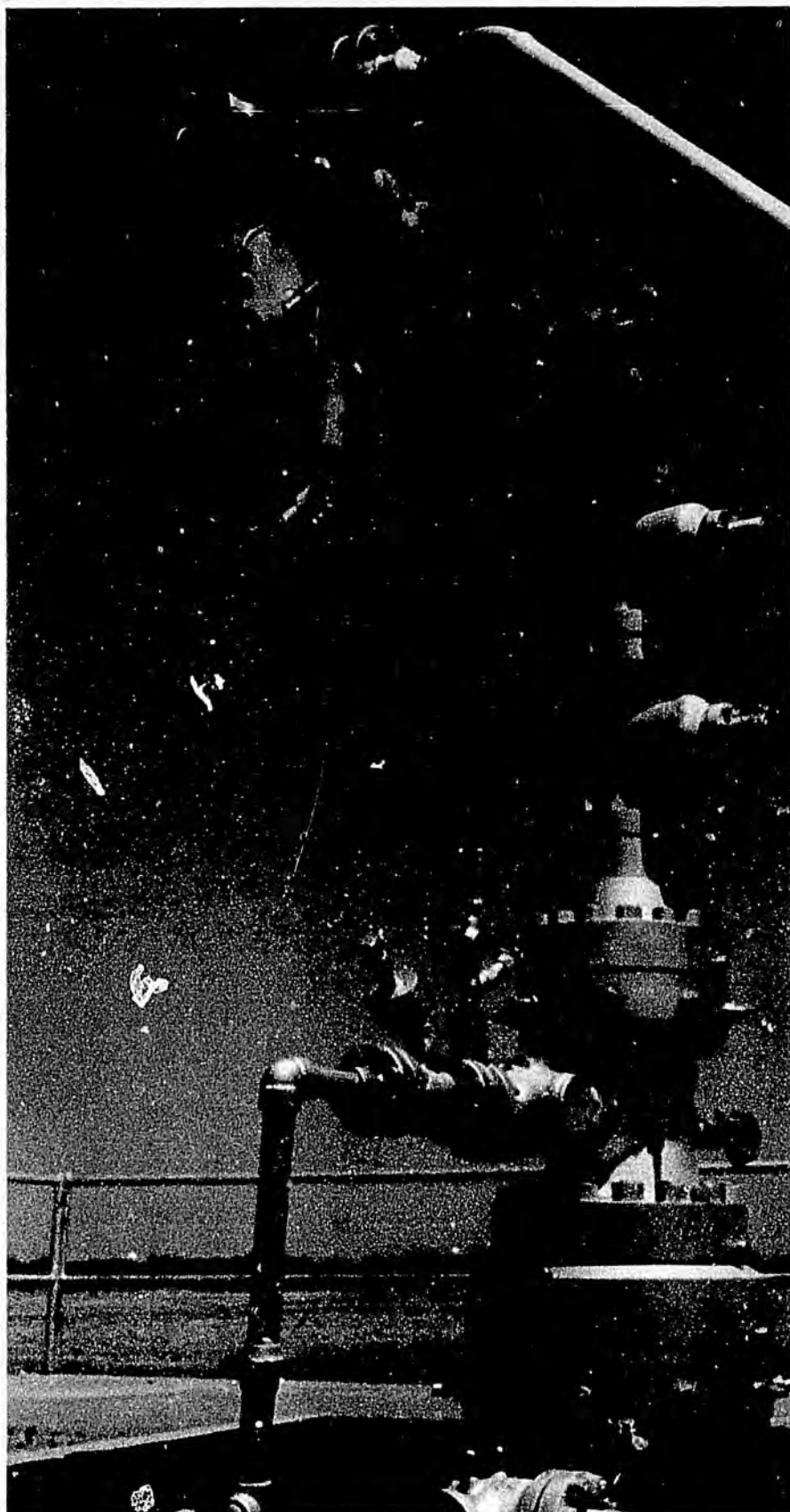
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Houston, Texas

Drilling Fluids and Drilling Controls

[†] Pat. Pend.

AGO 530140



AGO 530141

	Name of field and discovery date	Depth (ft)	No. of wells capable of production	Production in bbl		Gravity °API
				Daily avg. 1st 6 mos. 1972	Cumulative 7/1/72	
CANADA—Continued						
	Fenn-Big Valley, 1950	5,300-5,400	184	23,878	123,068,441	22.0-33.0
	Ferrier, 1955	6,655-8,526	75	3,486	6,294,189	44.0
	Garrington, 1954	6,600	71	1,538	11,533,745	39.0-43.0
	Gilby, 1955	5,850-7,050	78	5,254	23,717,039	27.0-41.0
	Glen Fork, 1951	4,627-6,200	9	2,031	7,995,634	29.0-39.0
	Golden Spike, 1949	3,570-5,861	21	34,328	135,742,322	36.0-38.0
	Goose River, 1963	7,764-9,100	13	6,146	9,493,803	40.0
	Harmattan East, 1957	8,040-8,558	32	6,913	27,491,875	38.0
	Harmattan Elkton, 1955	8,796-9,000	34	4,527	27,282,519	38.0
	Hussar, 1952	3,719-4,666	40	2,150	9,475,743	36.0
	Innisfail, 1956	6,730-8,440	14	8,131	31,348,024	38.0-44.0
	Joarcam, 1949	3,179	179	7,266	66,985,239	38.0
	Joffre, 1953	4,983-6,779	65	8,324	59,952,232	41.0
	Judy Creek, 1959	8,307-8,721	85	57,052	126,417,471	42.0
	Kaybob, 1957	4,586-10,442	29	13,868	40,508,241	45.0-48.0
	Kaybob South, 1958	6,947	49	7,630	15,455,103	45.0-48.0
	Leduc, 1947	3,062	464	18,545	307,486,926	40.0
	Lloydminster, 1933	1,840	132	2,221	17,984,886	11.0-17.0
	Medicine River, 1956	6,339-7,355	121	6,318	19,039,200	36.0-38.0
	Mitsue, 1964	5,908	120	40,790	59,839,149	42.0
	Nipist, 1965	5,648-5,726	145	39,147	47,876,499	42.0
	Pambina, 1953	2,991-3,470	2,881	150,272	688,924,763	32.0-37.0
	Rainbow, 1965	4,994-6,045	87	70,555	102,819,556	34.0-44.0
	Rainbow South, 1965	6,158-6,338	17	8,921	13,472,151	34.0-44.0
	Red Earth, 1956	4,184-4,878	56	7,779	8,160,631	38.0-39.0
	Redwater, 1948	2,012-3,200	307	74,999	433,297,719	35.0
	Simonette, 1958	10,464-11,460	7	5,537	13,221,934	47.0
	Snipe Lake, 1962	8,500	47	8,936	21,749,719	37.0
	Stettler, 1949	3,910-5,310	70	4,086	29,537,073	27.0-30.0
	Sturgeon Lake, 1952	8,901	8	2,199	9,232,495	38.0
	Sturgeon Lake South, 1953	4,912-8,471	99	15,305	55,040,708	37.0
	Sundre, 1954	8,022-9,090	29	3,302	17,607,187	32.0-41.0
	Swan Hills, 1957	7,851-8,740	406	100,134	232,041,912	40.0
	Swan Hills South, 1960	8,227	87	45,561	99,312,477	37.0
	Sylvan Lake, 1953	6,768-7,300	57	2,859	7,009,463	26.0-53.0
	Taber, 1942	3,200	38	1,373	4,781,826	20.0
	Taber South, 1963	3,200	53	2,733	7,628,528	21.0
	Turner Valley, 1913	3,100-9,150	109	2,562	121,499,722	39.0
	Utikuma Lake, 1963	5,624	27	2,179	4,123,329	34.0
	Virginia Hills, 1957	9,210	32	18,143	48,904,679	34.0
	Virgo, 1968	9,210	82	8,777	14,896,133	...
	Wainwright, 1925	2,190	264	6,510	22,655,346	22.0
	West Drumheller, 1952	5,475-5,651	54	2,488	20,313,422	41.0-42.0
	Westerose, 1952	6,818	11	14,929	37,632,550	42.0
	Willesden Green, 1956	5,195-8,100	379	15,022	42,403,477	39.0-41.0
	Wizard Lake, 1951	4,600	15	37,823	97,247,016	33.0-37.0
	Zama, 1967	6,000	142	15,986	27,598,721	29.0-35.0
	Others	....	1,387	2,489	92,328,687	....
	Total		9,430	1,033,715	3,801,083,845	
BRITISH COLUMBIA						
	Aitken Creek, 1959	4,400	7	1,271	2,962,578	38.0
	Beaton River, 1958	3,800	10	1,228	4,853,413	40.0
	Blueberry, 1953	6,950	23	1,153	8,601,327	40.0
	Boundary Lake, 1955	4,300-4,600	301	23,295	80,916,104	40.0
	Inga, 1966	5,300	63	9,940	12,886,475	40.0
	Milligan Creek, 1956	3,750	19	7,111	29,148,710	41.0
	Peejay, 1959	3,900	86	10,614	37,665,726	39.0
	Weasel, 1965	3,800	17	2,836	7,041,428	40.0
	Others	....	318	8,881	12,412,079	....
	Total		844	66,329	196,487,840	
MANITOBA						
	Daly 1951	2,550	106	1,684	15,275,930	32.0
	Virden-Roselea, 1953	2,030	193	3,624	24,788,414	30.0
	N. Virden-Scallion, 1963	2,010	220	7,099	36,595,774	35.0
	Routledge, 1955	2,100	110	1,444	10,460,414	35.0
	Others	....	66	479	6,420,401	....
	Total		695	14,330	93,540,933	
SASKATCHEWAN						
	Alameda, 1956	4,420	84	2,758	12,078,556	37.0-39.0
	Coleville, 1951	2,700	184	4,815	22,625,949	14.0
	Battrum, 1955	2,900	124	6,533	27,369,160	32.0
	Dollard, 1953	4,600	43	8,568	56,580,320	23.0
	Fosterton, 1952	3,200	37	6,932	43,354,097	22.0-24.0
	Instow, 1954	4,500	45	4,593	30,352,884	23.0
	Midale, 1953	4,600	374	13,150	68,650,462	28.0-32.0
	North Premier, 1953	3,300-3,500	50	4,613	13,113,932	23.0-24.0

	Name of field and discovery date	Depth (ft)	No. of wells capable of production	Production in bbl		Gravity °API
				Daily avg. 1st 6 mos. 1972	Cumulative 7-1-72	
CANADA—Continued	Steelman, 1954	4,590	607	25,703	155,779,880	31.0-39.0
	Weyburn, 1955	4,600	537	30,001	167,652,004	24.0-33.0
	Others	....	4,191	132,554	580,316,436	....
	Total	....	6,276	240,220	1,177,873,680	....
	ONTARIO	....	NA	....	....	....
	Rodney	200	174	1,250	6,593,255	....
	Total all fields*	....	....	3,182	51,787,774	....
	NEW BRUNSWICK	....	....	....	....	....
	Stoney Creek	....	....	25	750,639	....
	NORTHWEST TERRITORIES	....	....	....	....	....
	Norman Wells	....	41	2,618	14,547,410	....
	Total Canada	....	7,460	1,494,160	5,336,072,121	....

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
COLOMBIA	Acae, 1964	10,600	7	....	3	6,212	7,990,943	30.3
	Bonanza, 1964	4,000	2	11	2	2,668	5,516,599	32.5
	Boquete, 1961	8,000	7	....	3	2,793	7,854,308	27.0
	Caribe, 1969	7,750	2	1	1	1,144	999,557	32.0
	Casabe, 1941	3,880	....	285	46	7,374	192,623,988	20.9
	Cocorna, 1963	2,000	....	14	4	1,467	2,358,902	12.8
	Cristalina, 1959	10,700	....	3	....	845	3,232,784	30.2
	Dina, 1962	2,900	4	4	7	2,316	3,878,334	21.5
	Galan, 1945	3,800	....	58	16	1,327	14,740,747	19.0
	Infantas, 1918	2,000	1	306	13	4,208	205,744,492	26.0
	La Cira, 1925	3,250	1	635	40	17,598	394,821,751	24.0
	Lisama-Tene.A.B.1, 1957	9,500	9	5	3	1,643	3,820,583	31.4
	Llanito, 1960	7,350	2	23	8	1,460	8,124,730	21.0
	Orito, 1963	6,600	37	3	18	44,645	68,817,576	35.6
	Palagua-Velasquez, 1946	4,925	....	107	63	19,008	176,595,705	19.0
	Payoa, 1962	8,000	15	....	13	6,703	50,975,942	34.0
	Provincia, 1962	8,000	31	....	4	18,437	83,636,572	33.1
	Rio Zulia, 1962	5,600	10	5	5	24,353	86,746,252	41.3
	San Antonio, 1971	9,500	1	3	....	1,021	779,512	30.7
	Tibu, 1940	4,200	8	130	48	10,892	192,389,680	36.8
	Yariri, 1943	6,850	....	35	6	9,169	79,716,019	20.9
	Others	....	27	79	103	6,229	97,652,008	....
	Total	....	164	1,701	406	191,512	1,689,016,984	....
CONGO (Brazzaville)	Emeraude Marine, 1969*	1,900	....	12	3	5,000	910,000	23.0
	Pointe Indienne, 1957	5,000	5	....	4	300	5,771,000	37.0
	Total *Offshore	....	5	12	7	5,300	6,681,000	....

CONGO-KINSHASA (See Zaire)

DENMARK	Dan*	5,900- 6,562	....	....	5	Production began July, 1972		30.0
	*Offshore.	....	....	....	....	....	....	....

DUBAI	Fateh, 1966*	7,600- 8,500	21	....	1	129,605	104,360,389	32.3
	Fateh, SW, 1970*	7,500- 9,000	....	....	7	....	....	32.0
	Total *Offshore.	....	21	....	8	129,605	104,360,389	....

ECUADOR	SANTA ELENA:	....	....	....	....	....	....	....
	Ancon, 1921	4,000	4	543	1,668	2,878	97,373,772	37.0-40.0
	Others	1,000- 3,000	20	128	339	492	8,915,637	30.5-37.0
	Sub-total	....	24	671	2,007	3,370	106,289,409	....
	ORIENTE:	....	....	....	....	....	....	....
	Lago Agrio, 1967	10,200	22	....	3	29,924*	1,376,501	28.7
	Total *May 15, 1972-July 1, 1972.	....	46	671	2,010	33,294	107,665,910	....

EGYPT	Abu Rudeis, 1957†	8,500	....	....	....	....	13,204,947	23.0
	Al Yusr, 1966	4,264	15	....	....	7,531	6,735,000	20.5
	Asl, 1948†	3,000	....	....	....	....	34,269,304	23.0
	Belayim (Land & Offshore)* 1954†	7,000- 8,500	....	....	....	....	224,777,435	28.0
	El Alamein, 1966	8,700	8	....	6	19,066	38,832,032	33.5
	El Morgan, 1965*	....	....	....	....	....	....	....
	Kareem	5,500- 6,400	41	6	13	157,230	354,603,798	32.0
	Belayim	5,100- 5,700	2	....	....	6,136	810,000	27.0
	Kareem, 1958†	2,200	....	8	12	1,800	6,243,500	19.0
	Ras Amer, 1965†	4,264	1	3	....	1,000	2,079,400	20.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
EGYPT—Continued	Ras Bakr, 1958†	3,280	15	35	...	9,500	38,660,000	20.0
	Ras Gharib, 1938†	2,100	...	90	12	7,000	206,841,000	25.0
	Razzak, 1972	7,700	3	...	...	8,424	454,905	36.0
	Sidri, 1959†	8,100	...	...	...	...	4,038,736	23.0
	Sudr, 1946†	...	...	...	...	...	39,198,071	23.0
	Yidma, 1971	9,000	6	...	1	8,039	1,675,375	43.8
	Others	...	10	2	1	2,000	42,014,000	....
Total			101	144	45	227,726	1,014,437,503	

†Data estimated.

*Offshore.

†These fields on Sinai Peninsula being produced by Israel. Data is confidential, but daily output is estimated at 120,000 bbl. Cumulative production for the captured fields is carried forward for the record (data as of June 5, 1967).

FRANCE	ALSACE (All fields shut in)	....	....	....	....	....	26,368,290	....
	AQUITAINE BASIN							
	Esso Rep fields:							
	Cazaux, 1959	8,200	4	23	2	6,722	39,741,296	34.2-37.3
	Lavergne, 1962	10,550	2	1	...	1,212	8,547,387	40.4
	Parentis, 1954	7,550	7	13	4	15,682	153,381,235	33.0
	Others	....	....	14	2	1,125	13,003,090	....
	SNPA fields:							
	Lacq, 1949	2,130	7	21	17	1,062	20,218,161	20.6
	PARIS BASIN							
	Copeseq fields	1,530- 4,525	....	13	1	489	6,186,353	15.9-32.8
	Erap-CFP fields	2,000- 5,575	....	12	43	2,702	20,321,915	27.1-35.3
	Erap-RAP fields	4,985- 7,500	2	25	7	1,084	5,998,528	31.4-35.9
	Petrorep fields:							
	Coulommies, 1958	6,070	5	26	12	1,195	9,661,780	32.6
Total France			27	148	88	31,279	303,428,035	

GABON	Anguille Marine, 1962*	8,300	16	...	3	25,773	36,552,818	31.8
	Anguille Northeast, 1968*	7,480	7	...	...	10,636	11,202,006	31.4
	Anguille, Northwest, 1968*	7,500	1	...	...	1,868	550,386	31.4
	Cap Lopez North, 1962	6,700	4	...	5	6,139	12,051,621	23.9
	Gamba, 1963	3,000	30	...	11	34,036	76,814,800	32.4
	Ivinga, 1967	3,100	11	...	9	20,856	23,971,400	32.5
	Pointe Clairette, 1956	4,000- 5,000	17	...	12	2,900	23,305,248	29.9
	Port Gentil Ocean, 1964*	8,100	3	...	2	3,812	7,477,872	33.6
	Tchengue, 1959*	3,500	9	...	14	3,438	19,505,365	30.6
	Tchengue Ocean, 1962*	6,200	5	...	1	1,390	4,530,290	33.1
	Torpille Marine, 1968*	9,487	6	...	...	8,529	2,221,075	33.9
	Others	....	5	...	5	1,318	8,626,409	....
	Total		114	...	62	120,695	226,809,290	
	*Offshore.							

GERMANY, WEST	BAVARIA							
	Arlesried, 1964	4,900	...	17	...	2,293	5,024,669	47.0
	Darching, 1967	14,400	1	...	...	1,115	1,403,926	...
	Monchsrot, 1958	4,800	...	17	...	1,583	5,936,452	36.0
	Others	....	10	29	...	1,882	16,120,240	....
	Total		20	63	...	6,873	28,485,287	
	EMSLAND							
	Emlichheim, 1944	2,600	...	99	...	3,131	25,750,983	25.0
	Georgsdorf, 1944	1,800- 2,600	45	167	...	9,606	59,251,361	24.0-23.0
	Meppen-Schwefingen, 1960	4,000	8	8	...	1,370	5,166,550	28.0-30.0
	Ruhlermoor, 1949	2,000- 4,700	...	16	359	13,362	78,974,962	25.0-34.0
	Ruhlermoor, 1949	2,350- 2,900	...	...	...	2,304	20,816,042	25.0
	Scheerhorn, 1949	3,550- 3,750	...	128	...	4,643	27,435,252	30.0
	Others	....	...	171	...	2,298	21,878,238	....
	Total		75	932	...	36,714	239,273,386	
	SCHLESWIG-HOLSTEIN							
	Plon-Ost, 1959	6,400	2	56	...	8,924	26,901,113	36.0
	Preetz, 1962	8,350- 8,550	1	24	...	1,291	7,114,597	29.0
	Reitbrook, 1937	1,450- 2,100	7	46	...	3,287	29,799,949	29.0
	Others	....	1	85	...	1,290	40,953,341	....
	Total		11	211	...	14,792	104,769,000	
	HANNOVER							
	Eldingen, 1949	4,750	...	24	...	1,633	133,034,490	35.0
	Hankesbüttel, 1954	4,450- 5,100	12	33	...	10,634	56,100,784	33.0
	Hardesse, 1958	6,050	9	11	...	1,030	2,705,235	34.0
	Hohne, 1951	4,300- 5,900	...	37	...	5,126	30,208,094	33.0-34.0
	Knesebeck, 1958	5,100- 5,200	...	24	...	2,293	8,872,793	36.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 5 mo. 1-72	Cumulative 7/1/72	
WEST GERMANY—Continued	Lieferde, 1956	2,600	2	27		1,967	13,624,787	34.0
	Lüben, 1955	3,950	1	14		1,292	6,394,750	35.0-38.0
	Meckelfeld, 1938	1,000-1,300	1	25		1,669	10,166,164	24.0-32.0
	Nienhagen-Hanigsen, 1899	800-4,100		73		1,001	54,821,990	22.0-32.0
	Oelheim-Süd, 1968	1,650	9	4		1,413	2,028,598	33.0
	Orrel-Wesendorf-Nord, 1954	4,450		38		973	6,835,158	
	Rühme, 1954	1,950		40		944	4,840,091	
	Sinstorf, 1960	6,750-7,150		20		3,039	10,999,171	
	Suderbruch, 1949	3,750-7,550		60		1,363	18,275,897	15.0-38.0
	Vorhop, 1952	2,950-6,900	2	28		1,426	9,975,918	36.0
	Others		18	283		4,168	131,805,198	
	Total		54	741		39,971	500,689,118	
	UPPER RHINE VALLEY							
	Landau, 1955	3,950-4,800		78		3,074	14,544,379	36.0
	Others			19		355	9,797,546	
	Total			97		3,429	24,341,925	
	WESER-EMS							
	Barenberg, 1953	2,300-3,300	9	33		3,081	22,565,675	29.0
	Bockstedt, 1954	3,750		28		2,286	11,104,804	
	Bramberge, 1958	2,560-3,300	55	5		15,435	44,373,572	29.0
	Düste, 1954	2,600-4,250		147		2,620	29,427,789	
	Gross Lessen, 1969	3,300	3			5,439	3,299,015	
	Süd-Oldenburg, 1950	1,700-6,500	4	106		2,279	29,989,953	
	Volgtei, 1953	1,150-1,500	2	80		1,874	17,928,665	31.0-34.0
	Wehrbleck, 1957	3,400		63		527	9,729,258	33.0
	Others			94		175	17,771,384	
	Total		73	556		36,416	186,190,115	
	Total Germany West		233	2,600		138,195	1,083,748,833	
GHANA	Block 10, 1970*	7,700-8,500			1			37.0-40.0
	*Offshore. Production start up unknown.							
INDIA*	GUJARAT STATE							
	Ankleshwar, 1960	2,953-3,937		186				
	Bakrol, 1968	4,593-4,921		2				
	Kadi, N., 1968	2,953-3,609		9				
	Kadi, S., 1968	5,906-6,562		6				
	Kalol, 1961	4,265-5,250		106				
	Kuthana, 1965	5,250-5,906		6				
	Kholka, 1966	4,265-5,577		5		76,000		
	Kosamba, 1963	1,968-2,625		6				
	Nawagam, 1963	4,429-6,562		63				
	Sanand, 1963	4,265-4,593		13				
	Sobhasen, 1968	4,429-5,906		9				
	Wovel, 1963	4,265-4,593		1			400,822,880	22.0-48.0
	ASSAM STATE							
	Digboi, 1890	300-7,500		733				
	Geleki, 1968	12,632-12,795		1				
	Lakwa, 1965	8,038-12,795		64		74,000		
	Moran, 1958	11,000		45				
	Nahorkatiya, 1953	9,500		251				
	Rudrasagar, 1961	10,171-10,500		39				
	Total India			1,545		150,000		
	*Data are estimated							
INDONESIA	SUMATRA							
	P. T. Caltex:							
	Bangka, 1970	1,820-2,681		31		98,027	17,840,877	34.2
	Bekasap, 1955	2,500		24	5	87,163	200,613,101	31.9
	Bekasap, So., 1968	3,500		5	1	11,733	7,297,247	28.1
	Duri, 1941	600		326	50	34,455	219,957,994	22.1
	Kotabatak, 1952	4,575		31	2	36,455	13,465,881	30.9
	Leko, 1971	2,400		2	2	6,474	1,195,930	35.8
	Minas, 1944	2,400		146	41	373,466	1,446,013,332	35.2
	Mindal, 1971	3,200	1	1	1	1,698	1,065,649	36.0
	Pematang, 1959	6,500		15	2	54,028	81,600,453	29.2
	Petani, 1968	4,800		13	1	77,944	88,497,661	32.0
	Pungut, 1951	4,200		3	4	5,036	10,142,216	36.7
	Rangau, 1969	6,200		5	1	1,832	1,349,335	41.0
	Sintong, 1971	3,600		5	7	1,282	233,467	34.0
	So. Balam, 1969	1,253-2,500		19	1	17,693	3,220,185	30.9
	Tandun, 1970	3,000	1	2	1	2,151	2,312,004	31.9
	Others			3		424	458,409	
	P. T. Stanvac (Central):							
	Lirik, 1939	1,600		20	13	3,828	22,148,846	35.0
	Molek, 1956	2,600		12	11	4,028	3,394,746	35.0
	Pulai, No., 1951	1,800		26	14	4,563	26,165,755	35.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
INDONESIA—Continued	Sago, 1940	1,800	....	88	124	11,825	97,955,790	35.0
	Others	....	....	18	17	1,747	10,945,211	....
	P. T. Stanvac (South)							
	Abab, 1951	6,000	20	2	23	19,930	15,768,672	33.9
	Benakat, 1952	1,600	....	77	209	5,308	120,338,168	35.0
	Dewa, 1971	7,675	8	....	5	2,847	518,620	....
	Ibul, 1970	5,600	16	1	19	16,697	6,459,943	....
	Jirak, 1930	900	....	41	182	1,373	49,954,185	36.8
	Talang Akar, 1922	2,800	61	6	423	1,419	247,693,683	35.0
	Others	....	42	4	243	1,775	133,415,734	....
	Pertamina Unit I (North)							
	Lee Tabue, 1971	2,112-3,564	44	....	31	11,848	2,627,946	....
	Julo Rayeu, 1929	2,520-90	26	....	42	4,287	5,383,044	54.5
	Rantau, 1929	950-4,540	204	1	223	34,242	166,558,324	48.5
	Others	....	15	7	572	1,586	74,384,292	....
	Pertamina Unit II (South Sumatra)							
	Belimbing, 1964	5,200	11	....	3	4,609	11,978,755	27.6
	Gunung Kemala, 1938	6,340	8	....	43	1,053	21,696,512	27.0
	Kenali Asam, 1931	3,800	12	53	200	2,210	84,511,186	36.1
	Kluang, ?	....	....	9	....	1,174	214,670	41.1
	Kuang, 1967	4,800	7	....	3	2,086	2,652,364	....
	Limau, 1928	4,500-5,400	9	....	148	11,532	183,567,058	27.6
	Talang Jimar, 1937	4,200	4	71	127	4,679	151,222,128	28.7
	Tandjung, Tiga, 1948	4,600	....	29	47	2,413	43,890,419	28.0
	Tempino, 1931	2,700	1	68	106	1,796	79,159,311	41.3
	Others	....	13	33	248	1,791	139,408,530	....
	WEST IRIAN							
	Pertamina Unit V							
	Klamono, 1936	500	....	32	16	1,347	86,954,342	18.8
	JAVA							
	ARCO							
	Ardjuna, 1968*	2,200-3,300	14	....	....	22,035	5,565,338	36.0
	IIAPCO							
	Cinta, 1970*	3,300	9	....	....	35,500	8,927,885	33.7
	Pertamina Unit III	....	5	24	30	250	11,242,176	....
	Lemigas (Oil & Gas Institute)	....	2	58	453	1,171	123,584,459	....
	KALIMANTAN (Indonesian Borneo)							
	Pertamina Unit IV							
	Bunyu, 1923	2,020-7,800	33	1	46	4,642	51,410,292	24.5-32.6
	Sanga-Sanga, 1898	1,200	21	68	558	1,273	236,894,345	17.0-35.0
	Tanjung-S. Warukin, 1938-1965	2,500-7,300	14	51	104	9,994	86,478,755	32.8
	Tarakan, 1906	200-2,400	6	183	701	1,579	195,167,470	20.0-21.0
	Others	....	1	19	294	460	61,379,311	32.4
	MADURA	....	....	....	....	....	23,260	....
	CERAM							
	Gulf & Western Bula, ?	500-600	....	15	17	1,635	9,036,596	21.6
	Total Indonesia		696	1,648	5,414	1,050,393	4,673,941,862	
	* Offshore.							

IRAN

CONSORTIUM FIELDS:								
Agha Jari, 1938	6,500	45	....	....	958,518	4,994,552,000	33.9	
Ahwaz, 1958	9,000	22	....	....	281,085	688,507,000	32.7	
Bibi Hakimeh, 1961	6,800	15	....	....	448,186	773,090,000	29.6	
Binak, 1959	11,600	1	....	....	49,437	61,489,000	29.8	
Gach Saran, 1928	7,000	29	....	....	865,629	2,648,295,000	31.3	
Haft Kel, 1927	3,500	11	....	....	41,211	1,637,591,000	37.4	
Karanj, 1963	7,800	4	....	....	188,215	283,658,000	33.8	
Kharg Island, 1962	11,800	4	....	....	50,868	48,948,000	33.4	
Kupal, 1965	1,000	2	....	....	1,774	2,571,000	34.2	
Lali, 1948	8,000	1	....	....	1,456	58,953,000	36.2	
Marun, 1964	11,000	30	....	....	1,003,090	1,223,023,000	32.2	
Masjid-e-Sulaiman, 1908	2,500	19	....	....	8,001	1,077,193,000	39.8	
Naft Safid, 1935	6,000	11	....	....	30,893	235,964,000	35.4	
Paris, 1964	5,700	15	....	....	366,208	240,198,000	33.9	
Par-e Siah, 1967	6,000	1	....	....	10,710	7,516,000	38.1	
Pazanan, 1961	9,000	2	....	....	20,180	115,378,000	35.4	
Rag-e Safid, 1964	8,300	4	....	....	34,929	62,068,000	30.4	
Ramshir, 1963	9,100	2	....	....	11,716	12,357,000	28.8	
Total Consortium		218	....	....	4,372,106	14,171,351,000		
SIRIP FIELDS:								
Bahrgansar, 1960*	9,000-12,300	7	....	3	20,500	80,900,000	32.0	
Hendijan, 1968*	9,850-11,000	5	....	....	32,440	11,200,000	32.0	
Nowrouz, 1966*	8,587-10,850	10	....	5	42,120	16,300,000	30.0	
Total Sirip		22	....	8	95,060	108,400,000		
AMOCO FIELDS:								
Cyrus, 1962*	7,000	7	....	5	18,287	26,733,411	19.0	
Darius, 1961*	1,000	12	....	1	109,897	229,534,711	34.0	
Total Amoco		19	....	6	128,184	256,268,122		

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
IRAN—Continued	IMINOCO FIELDS:							
	Rakhs, 1969*	7,500-9,750	11		3	54,400	15,100,000	36.7
	Rostam, 1966*	7,200-9,800	18	7	6	35,100	49,400,000	38.7
	Total Iminoco		29	7	9	89,500	64,500,000	
	LAPCO FIELDS:							
	Sassan, 1966*	4,000-6,800	12		6	150,125	177,284,186	31.0-34.0
	NIOC FIELDS†:							
	Alborz, 1956	8,000-9,000			17		5,115,892	39.0
	Naft-i-shah, 1923	2,000-3,000	6			10,000	79,730,000	
	Sarajeh, 1958	8,000-9,000			(7 gas)			
	Total NIOC		6		17	10,000	84,845,892	
	Total Iran		306	7	46	4,844,975	14,862,649,200	
	*Offshore.							
	†Estimated.							
IRAQ	Ain Zalah, 1939	5,200-6,500	6		6	20,200	145,134,558	31.0
	Bai Hassan, 1953	4,800-5,400			5	56,500	204,290,511	35.0
	Butmah, 1952	3,900		3		5,000	31,268,950	31.0
	Jambur, 1954	5,500	2		2	8,400	59,565,452	35.0
	Kirkuk, 1927	2,800-4,200	47		19	900,000	5,733,017,018	36.0
	Naft Kaneh, 1923*	3,000	4			7,000	76,100,000	
	Rumaila, 1953	10,800	26		2	534,500	1,476,910,000	35.0
	Rumaila, N., 1953*	10,500	10			30,000	2,730,000	35.0
	Zubair, 1948	7,400-11,200	25		5	103,700	592,830,000	35.0
	Total		129	3	38	1,665,300	8,321,846,489	
	*Data are estimated							
ISRAEL	Heletz-Brur, 1955	5,970		20		730	260,000	30.0
	Kochav, 1963	5,630		10		240	93,000	26.5
	Total			30		970	353,000	
ITALY	Gela, 1956	10,800-11,150	*9	*1	4			
			36	13	7	10,370	64,074,430	10.1
	Pisticci-S. Cataldo, 1960	6,560	8		2	1,041	3,128,817	11.4
	Ragusa, 1954	12,460		33	16	6,814	1,245,441	19.7
	Others		21	7	17	2,420	16,345,208	
	Total		74	54	46	20,645	84,793,896	
	*Field lies on and offshore.							
JAPAN	Kubiki, 1954*	1,099-6,370	133		6	1,228	9,838,353	31.0
	Minami-Aga, 1964	7,278-9,574	18		8	2,681	9,298,518	38.5
	Sarukawa, 1958	3,880	54		4	1,418	6,171,855	32.8
	Others		188	685	481	9,273	139,185,694	
	Total		393	685	499	14,600	164,494,420	
	*Offshore.							
KUWAIT	Uthrah, 1956	8,500	2					
	Burgan, 1938	4,800	368					
	Magwa/Ahmadi, 1952	4,800	178					
	Minagish, 1959	10,000	14					
	Raudhatain, 1955	8,500	51					
	Sabiriyah, 1957	8,000	48					
	Umm Gudair, 1962	9,300	31					
	Total		692			2,965,637	13,354,751,371	
LIBYA	Amal, 1959	9,900		1	18	136,340	383,522,505	36.0
	Arshad, 1966	10,100	2		5	2,352	5,651,531	48.0
	Bahi, 1968	3,600-3,750		40	1	103,414	95,790,974	43.4
	Beda, 1959	4,000		34	34	6,855	70,424,016	36.0
	Belhedan, 1962	7,200	4		2	6,197	24,032,261	33.7
	Dahra, 1959	3,100-3,700	6	38	89	36,837	338,272,619	37.0-41.0
	Defa, 1969	5,400-5,900	55		7	146,699	200,044,659	36.5
	Dor, 1967	6,400		3	2	5,026	10,860,744	32.0
	Dor-Marada, 1967	9,000	1		7	4,720	10,127,740	50.0
	Ed-Dib, 1970	3,500		1	3	2,004	2,104,933	38.0
	Farigh, 1969	12,000	3		1	2,242	3,887,964	39.0
	Farrud, 1964	3,000		3	3	3,283	14,512,806	47.0
	Gialo, 1961	2,200-6,300	4	140	34	312,304	883,822,028	35.7
	Intisar A, 1967	9,750	16		1	119,387	423,523,348	45.0
	Intisar C, 1967	9,650	6		1	31,069	28,256,414	39.0
	Intisar D, 1967	9,400	13			265,845	362,499,372	40.0
	Jebel, 1962	8,100	20		1	15,927	90,502,020	37.0
	Kotla, 1963	5,500		9	3	9,467	30,750,016	32.0
	Lehib, 1966	9,100	9		5	11,448	22,208,526	49.0
	Nafoora, 1965	2,200-10,000	21	18	9	67,577	138,281,048	36.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
LIBYA—Continued	Nafoora-Augila Unit, 1965-1968*	8,800-9,000	43	....	18	215,077	415,590,300	35.0
	Ora, 1962	4,700-7,500	1	23	13	8,225	57,794,427	36.0
	Raguba, 1961	5,400	44	....	28	95,664	342,508,452	43.0
	Rakb, 1962	2,500-11,000	3	7	2	8,084	17,770,329	34.0
	Ralah, 1964	7,650	3	....	1	2,341	4,740,795	37.0
	Sahabi, 1968	10,300	6	1	2	10,626	10,080,345	39.0
	Samah, 1961	6,400	11	....	9	50,889	199,096,994	33.8
	Sarir, 1961	9,000	50	....	38	202,352	627,817,512	37.8
	Ummfarud, 1962	3,300	....	7	1	3,207	14,224,482	47.0
	Waha, 1960	6,600	....	43	19	117,307	426,037,137	36.5
	Zaggut, 1962	6,000	5	....	3	2,354	14,711,072	36.5
	Zelten, 1959	5,500-7,600	61	....	55	238,152	1,535,479,299	39.0
	Magid, 1968	9,600-9,800	6	....	1	14,224	15,336,595	40.5
	Mansour, 1968	6,400	1	1	....	2,072	3,143,870	32.3
	Others†	....	....	....	89	346	84,024,447	....
	Total	....	394	369	505	2,260,113	6,907,431,670	....

†Gas-lift wells excluded. *Unitized Nov. 1, 1971. Amoseas operator. †Includes Ain Jarbi & Khuff (abandoned), and Hofra and Bu Attifel (shut in).

MEXICO	NORTHEASTERN DISTRICT, NORTHERN ZONE							
	Monterrey, 150	6,950	15	10	....	3,477	7,914,846	47.0
	Others	....	34	7	....	1,196	18,511,388	....
	NORTHERN DISTRICT, NORTHERN ZONE							
	Arenque, 1970*	11,362	6	....	....	7,305	3,098,409	26.0
	Constituciones, 1956	6,300	49	54	....	6,866	37,887,508	17.0
	Ebano-Panuco, 1901	1,450	222	270	....	8,845	922,648,040	12.0
	Tamaulipas, 1956	4,200	65	44	....	7,470	33,757,814	18.0
	Others	....	15	6	....	591	10,716,122	....
	SOUTHERN DISTRICT, NORTHERN ZONE							
	Gabo Nuevo, 1967†	5,753	3	....	....	2,302	9,118,550	16.0
	Isla de Lobos, 1963*	6,875	5	....	....	4,184	14,344,672	40.0
	Naranjos-Cerro Azul, 1909	1,800	188	....	....	8,690	1,146,133,319	20.0
	Tiburón, 1965*	7,314	7	....	....	2,497	4,341,276	20.0
	Tres Hermanos, 1959	6,960	41	....	....	12,895	79,712,026	21.0
	Others	....	45	....	....	1,204	27,672,885	....
	POZA RICA, CENTRAL ZONE							
	Atún, 1966*	9,040	11	....	....	7,290	23,921,147	37.0
	El Hallazgo, 1955	10,170	1	53	....	6,427	52,545,421	25.0
	Jiliapa, 1958	7,390	....	33	....	2,166	21,274,422	34.0
	Miquetla, 1959	6,480	2	....	....	1,632	15,388,196	35.0
	Morsa, 1971	10,434	4	....	....	10,511	4,040,306	37.0
	Poza Rica, 1930	7,090	56	263	....	58,009	1,012,658,443	35.0
	Remolino, 1962	10,745	6	42	....	3,843	13,211,535	....
	San Andres, 1962	10,410	5	150	....	35,045	218,525,601	29.0
	Others	....	20	56	....	4,712	50,857,326	....
	NUEVA FAJA DE ORO							
	Acuatempa, 1955	4,085	14	....	....	2,052	21,072,148	21.0
	El Muro, 1966	3,966	11	....	....	4,725	5,805,934	17.0
	E. Ordóñez, 1952	5,220	12	....	....	3,008	49,388,582	21.0
	St. Aqedda, 1953	4,789	33	....	....	5,671	86,361,770	16.0
	Others	....	76	....	....	3,258	39,732,433	....
	VERACRUZ DISTRICT, CENTRAL ZONE							
	Angostura, 1953	4,405	8	....	....	425	21,243,185	15.0
	Others	....	....	....	....	....	173,315	....
	ISTHMUS OF TEHUANTEPEC, SOUTHERN ZONE							
	Agata, 1956	3,830	2	14	....	1,243	8,923,152	34.0
	Cuichapa, 1935	2,200	165	8	....	44,925	39,759,417	30.0
	El Burro, 1931	2,200	1	18	....	1,036	16,376,889	26.0
	El Plan, 1931	1,700	5	81	....	4,702	137,214,702	30.0
	Ixhuatlán Oriente, 1965	3,952	16	2	....	1,440	3,139,359	22.0
	Los Soldados, 1953	4,492	17	6	....	2,695	16,410,025	32.0
	Moloacán, 1948	1,397	9	82	....	3,493	4,132,800	26.0
	Tacuilolapa, 1955	2,925	3	4	....	951	2,021,009	36.0
	Tonalá, 1928	1,770	2	52	....	1,670	70,856,429	28.0
	Tunel, 1967	1,230	(Included in Moloacan field)			....	....	....
	Others	....	4	60	....	2,026	48,433,639	....
	TABASCO, SOUTHERN ZONE							
	Caracolillo, 1969	11,480	5	....	....	1,837	838,414	....
	Carrizo, 1962	4,820	10	8	....	3,252	4,894,029	25.0
	Castarrical, 1967	10,086	28	9	....	9,804	13,200,981	34.0
	Cinco Presidentes, 1960	6,862	75	103	....	38,442	164,383,740	35.0
	El Golpe, 1963	8,836	31	48	....	19,526	32,422,591	35.0
	La Venta, 1954	4,730	2	47	....	3,294	42,397,361	41.0
	Magallanes, 1957	4,240	18	192	....	18,989	85,535,741	27.0
	Mecoacan, 1958	7,110	23	18	....	5,412	25,400,083	24.0
	Ogarrio, 1957	5,790	25	60	....	11,634	71,222,696	38.0

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
MEXICO—Continued	Otates, 1965	7,469	16	9	....	6,065	11,657,270	39.0
	Pajonal, 1967	9,840	4	5	....	1,173	1,295,671	27.0
	Samaria, 1960	2,624	2	10	....	1,075	3,328,222	23.0
	San Ramon, 1967	9,883	37	22	....	17,757	11,497,276	30.0
	Santa Ana, 1959†	9,517	1	13	....	1,454	28,205,561	29.0
	Santuvario, 1966	9,617	17	....	....	5,356	2,673,401	37.0
	Tintal, 1968	5,904	9	....	....	1,354	1,350,896	22.0
	Tucan, 1968	10,824	3	10	....	2,399	3,259,283	36.0
	Tupilco, 1959	9,685	27	18	....	11,928	18,447,393	27.0
	Others	....	10	4	....	1,459	9,377,284	....
	Total Mexico		1,518	1,903	....	441,736	4,830,711,933	
	*Offshore. †Partly offshore.							
MOROCCO	Haricha, 1957	3,000	2	1	....	25	2,747,000	40.0
	Sidi Fili, 1947	....	19	8	....	110	7,488,000	40.0
	Sidi Rhalem, 1961	5,600	....	2	....	175	4,860,000	40.0
	Total		21	11	....	310	15,095,000	
NETHERLANDS	De Lier-Monster, 1955	5,200	16	....	11	1,250	11,976,300	33.2
	Ijsselmonda-Ridderkerk, 1956	3,100-5,000	48	....	10	7,787	58,138,200	18.0-24.2
	Schoonebeek, 1943	2,500	198	....	104	14,423	151,281,800	24.8
	Wassen-Mayendel, 1956	4,200	25	....	7	5,005	29,463,900	18.6
	Zoetermeer, 1957	3,200	13	....	5	900	6,228,500	16.4
	Others	....	19	....	25	481	8,123,200	....
	Total		319	....	162	29,846	265,211,900	
NEUTRAL ZONE	Hout, 1969*	5,470-9,130	26	....	6	59,434	58,868,000	34.0
	Khalji, 1961*	5,570-7,540	89	....	7	322,240	893,234,000	28.4
	So. Fuwaris, 1962	6,700	....	4	4	2,133	9,653,430	24.5
	So. Umm Gudair, 1966	9,100	10	4	3	49,058	72,237,964	23.4
	Wafra:							
	Burgan, 1953	3,600	11	35	9	20,507	172,619,081	34.5
	Eocene, 1954	1,200-2,200	8	222	85	37,965	336,246,099	18.5
	Ratawi, 1955	6,750	3	28	8	53,150	263,379,923	24.5
	Total		147	293	122	544,487	1,806,238,497	
	*Offshore. Note: Two fields—Lulu (2 wells) and Dorra (1 well) not yet producing.							
NEW ZEALAND	Kapuni, 1959	11,323-12,504	4	....	....	2,706	1,760,213	49.0
	Others*	....	....	....	....	....	217,000	....
	Total		4	....	....	2,706	1,977,213	
	*Old (1866) Moturoa field at New Plymouth was abandoned in 1972.							
NIGERIA	GULF OIL*							
	Delta, 1965	5,600-9,400	11	....	1	15,499	26,887,576	28.3
	Delta So., 1965	7,100-9,200	14	....	4	42,858	61,936,838	39.4
	Isan, 1970	5,800-9,000	5	....	3	10,120	1,436,985	44.0
	Malu, 1969	4,800-6,300	15	....	....	29,687	12,822,135	39.3
	Meji, 1965	5,200-10,900	10	....	1	14,370	24,553,816	33.0
	Meren	5,000-7,500	32	....	9	91,147	96,472,732	35.7
	Okan, 1969	5,500-8,900	39	....	3	69,415	153,401,745	35.7
	Parabe, 1968	4,500-8,200	25	....	....	38,560	16,644,176	39.3
	MOBIL OIL*							
	Asabo, 1966	5,412	8	....	1	35,285	27,719,805	33.2
	Ekpé, 1966	7,503	11	....	....	51,790	10,379,147	38.2
	Idoho, 1966	8,536	2	....	2	9,922	14,552,170	39.3
	Inim, 1966	5,914	4	....	....	15,036	2,751,598	38.3
	Ubit, 1968	4,842	14	....	4	36,492	18,120,575	37.2
	Utue, 1966	5,656	3	....	....	2,755	504,245	38.7
	AGIP-PHILLIPS							
	Ebocha, 1965	9,200-10,100	8	....	1	15,000	24,100,000	42.1
	Mbede, 1966	9,850-10,800	13	....	5	35,000		
	SAFRAP							
	Obagi, 1964	7,300	18	....	5	51,609	30,126,846	24.7
	TEXACO-CHEVRON*							
	Pennington, 1964	8,000-12,000	7	....	2	11,425	6,745,839	37.0
	SHELL-BRITISH PETROLEUM (MIDWEST)							
	Ugh-Ogini, 1964	5,860	6	....	2	6,198	2,258,600	17.5
	Ugh-Uzere East, 1960	8,500	11	....	1	13,706	29,127,600	22.6
	Ugh-Uzere West, 1960	8,500	11	....	....	20,778	45,847,900	27.7
	Ugh-Olomoro, 1963	7,000-10,000	24	....	7	67,697	123,631,800	22.3
	Ugh-Okech, 1964	12,300	9	....	2	22,313	46,660,000	26.8
	Ugh-Kokori, 1961	8,000-9,800	18	....	3	83,046	103,165,800	44.9
	Ugh-Asfriesfre, 1966	8,000-9,000	14		3	17,922	18,757,900	23.8
	Ugh-Eriemu, 1961	12,500	8		2	5,144	6,397,900	29.9

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WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
NIGERIA—Continued	Ugh-Ughelli E., 1959	11,800	6	....	2	26,986	36,350,600	33.6
	Ugh-Ughelli W., 1959	7,400-10,200	6	....	....	8,026	8,993,300	20.0
	Ugh-Utorogu, 1964	9,000	19	....	....	40,059	41,547,000	25.0
	Ugh-Oroni, 1964	12,000	6	....	1	7,872	5,962,000	19.0
	Ugh-Warri-Ri-1, 1961	12,264	4	....	....	5,094	1,057,300	30.8
	Ugh-Evwreni, 1967	10,900	7	....	2	11,365	13,071,100	25.0
	Ugh-Rapele, 1965	12,934	3	....	....	8,910	2,129,700	25.0
	Ugh-Osioka, 1967	12,885	2	....	....	3,653	601,300	30.0
	Forc-Odidi, 1967	10,980	15	....	....	16,385	6,515,200	30.0
	Forc-Jones Cr., 1967	7,000-9,000	26	....	....	141,325	56,401,700	25.0
	Forc-Egwa, 1967	9,350	11	....	....	21,521	13,672,600	37.0
	Forc-Forc Est., 1969	7,000	38	....	3	100,309	51,987,900	25.0
	Forc-Batan, 1968	11,000	6	....	1	11,165	2,633,000	21.0
	Forc-Escravos Beach, 1969	9,391	8	....	....	4,894	447,000	36.0
	Forc-Ajuju, 1970	13,324	1	....	....	2,294	371,500	30.0
	Others		3	....	18	875	167,200	....
	SHELL-BRITISH PETROLEUM (EASTERN)							
	PHL-Bomu, 1968	6,700-7,500	27	....	1	41,917	212,296,600	33.2
	PHL-Isimiri, 1964	5,900-11,000	5	....	....	7,747	12,015,300	28.8
	PHL-Imo River, 1959	5,800-10,100	38	....	....	95,097	181,284,000	32.0
	PHL-Ebubu, 1958	8,200	6	....	....	3,397	10,668,100	26.0
	PHL-Onne, 1965	10,384	2	....	....	2,471	610,700	30.0
	PHL-Nkali, 1963	12,000	6	....	1	5,604	10,157,800	41.0
	PHL-Obigho-N, 1963	6,500-10,000	15	....	1	28,338	65,154,200	24.2
	PHL-Efelenwa, 1959	11,000	5	....	....	7,401	2,619,100	38.0
	PHL-Agbada, 1960	8,000-12,000	20	....	....	30,333	44,304,400	32.1
	PHL-Umuechem, 1959	5,800-10,700	15	....	....	31,759	81,925,900	37.6
	PHL-Apara, 1960	9,000	3	....	....	1,061	4,472,400	34.0
	PHL-Obele, 1964	10,000	3	....	....	2,006	600,100	22.0
	PHL-Bodo W., 1962	9,700	9	....	1	24,977	24,876,600	22.5
	PHL-Afam, 1956	6,000	9	....	2	9,935	15,242,300	45.0
	PHL-Korokoro, 1969	8,000-9,800	7	....	....	14,446	46,184,500	35.2
	PHS-Alakiri, 1962	10,000	13	....	....	33,294	20,519,700	32.5
	PHS-Buguma Creek, 1960	12,195	2	....	1	4,632	444,400	35.0
	PHS-Cawth. Ch., 1963	11,000	11	....	1	70,618	57,333,400	39.0
	PHS-Ekulama, 1958	10,483	5	....	....	6,313	999,600	20.2
	PHS-Soku, 1958	11,500	17	....	2	35,245	7,599,600	35.0
	PHS-Oloibiri, 1956	8,000-9,800	7	....	....	3,961	15,046,300	22.0
	EGB-Oguta, 1965	10,300	11	....	2	23,894	8,274,100	30.0
	EGB-Assa, 1961	11,300	2	....	....	2,120	194,200	17.5
	EGB-Egbema, 1960	10,470	6	....	....	16,822	12,069,200	28.0
	EGB-Ahia, 1965	11,500	13	....	....	31,273	24,919,500	35.5
	CESW-Adibawa, 1966	11,950	5	....	2	8,708	2,223,300	30.0
	Others		11	....	17	1,981	2,167,300	....
	Total Nigeria		774	....	119	1,768,857	2,021,114,728	....
	*Offshore							
NORWAY	Ekofisk, 1970*	10,200-10,900	4	....	....	32,482	8,207,458	35.6
	Ekofisk W., 1970*	10,000	....	....	1	....	....	35.6
	Tor, 1970*	10,000	....	....	1	....	....	35.6
	Total		4	....	2	32,482	8,207,458	....
	*Offshore							
OMAN	Fahud-Natih, 1964	2,000-6,080	35	....	43	114,454	311,201,000	32.5
	Huwaisa-Shuaiba, 1970	5,550	10	....	....	32,864	16,468,100	33.0
	Natih-Natih, 1963	7,500	15	....	15	58,235	147,234,400	31.3
	Yibal-Shuaiba, 1962	8,465	37	....	5	70,459	35,040,400	39.7
	Total		97	....	63	276,012	509,944,000	....
PAKISTAN	Balkassar, 1946	8,200	....	5	....	2,415	26,581,073	24.3
	Dhulian, 1937	8,500	5	2	....	3,190	34,632,000	43.0
	Meyal, 1968	12,500	2	....	....	2,500	2,398,000	44.0
	Others		3	....	1	1,250	8,430,660	....
	Total		10	7	1	9,355	72,041,733	....
PERU	COASTAL							
	Area Talara, 1869-1943†	2,000-9,000	104	1,004	5,224	10,513	521,772,830	25.0-40.0
	Concesiones Lima, 1905	2,000-9,000	62	847	1,833	23,529	246,640,232	32.0-35.0
	Others	500-1,500	....	....	55	....	4,205,455	33.0-34.0
	†Includes La Brea y Parinas and Los Organos.							
	EASTERN							
	Agua Caliente, 1939	1,000-1,500	....	23	12	1,123	12,399,235	34.0
	Maquila, 1957	1,000-1,500	6	7	1	1,146	5,611,807	37.0
	Area Corrientes, 1971	12,000	....	....	3	....	....	....
	CONTINENTAL SHELF							
	Humboldt, 1960*	3,000-7,500	46	58	42	17,284	15,027,534	38.0
	Litoral y Mirador, 1955*	1,500-6,000	1	96	70	4,336	22,097,600	37.0-40.0
	Providencia, 1967*	3,000-6,000	2	31	29	1,903	8,183,692	....

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
PERU—Continued	Delfin y Ballena*	3,000-7,000	2	7	2	353	1,519,918	.....
	Others							.....
	*Offshore							.....
	SIERRA Pirin, 1925						287,000	.....
	Total Peru		223	2,073	7,272	60,187	837,745,303	
QATAR	Duklan, 1940	6,200-7,200	57	....	4	210,000	1,270,953,069	41.0
	Bul Hanine, 1970*	6,000	2	....	1	8,283	753,700	35.0
	Idd El Shargi, 1960*	4,500-8,250	14	....	....	43,579	114,570,800	35.5
	Maydan-Mahzan, 1963*	7,000-7,600	11	....	....	148,188	275,809,600	38.0
	Total		84	....	5	431,750	1,662,545,100	
	*Offshore.							
SAUDI ARABIA	Abqaiq, 1940	6,670	74	5	3	931,879	3,886,450,366	38
	Abu Hadriya, 1940	9,930	7	3	0	95,919	212,584,748	35
	Abu Safah, 1963*	6,650	9	0	1	94,748	148,634,819	30
	Berri, 1964†	7,450	18	10	1	313,487	165,692,250	33
	Dammam, 1938	4,620	20	0	4	23,084	517,871,607	34
	Fadhili, 1949	8,110	3	2	0	51,381	111,557,756	40
	Ghawar, 1948	6,700	205	23	8	2,668,202	7,127,596,792	35
	Harmaliyah, 1971	8,400	0	1	0	....	....	36
	Khurais, 1957	5,100	9	1	1	22,610	28,131,775	33
	Khursaniyah, 1956	6,750	10	0	2	129,020	371,550,624	31
	Mani'a, 1957*	7,950	5	2	0	49,480	89,268,143	28
	Marjan, 1971	5,200	0	1	0	....	....	32
	Mazali, 1971	5,200	0	1	0	....	....	31
	Qatif, 1945*	7,050	20	0	2	122,976	353,018,536	31
	Safaniyah, 1951*	5,100	83	12	8	909,924	2,140,954,223	27
	Shaybah, 1968	5,000	1	7	0	....	9,870	42
	Zuluf, 1965	5,800	0	3	0	....	....	32
	Total		464	71	30	5,412,710	15,153,321,509	
	*Offshore, †Partly offshore.							
SPAIN	Ayoluengo, 1964	4,000	....	22	5	2,960	6,200,000	37.0
	Amposta, 1971*	10,000	....	....	4	....	....	19.0
	Total			22	9	2,960	6,200,000	
	*Offshore							
SYRIA*	Hamsch, 1956	6,000	....	....	1	....	....	21.0
	Jibissa, 1968	6,000	....	....	1	....	....	23.0
	Karatchouk, 1956	6,500	13	3	1	10,000	....	23.0
	Rumalan, 1956	6,500	4	....	1	5,000	115,933,446	25.0
	Souedie, 1959	6,500	80	23	31	105,000	....	25.0
	Total		97	26	35	120,000	115,933,446	
	*Data are estimated							
TAIWAN	Tiehchanshan, 1962	8,500-18,000	26	....	2	1,700	926,736	53.0
	Others		25	....	17	230	125,636	....
	Total		51	....	19	1,930	1,052,372	
THAILAND	Boh Ton Kham (Chaiprakarn), 1953	700	....	12	12	10	196,000	16.0-17.0
	Mae Soon Luang, 1963	2,000-2,500	1	12	5	146	359,000	32.0
	Total		1	24	17	156	555,000	
TRINIDAD & TOBAGO	Area 1:							
	North Marine, 1959	3,000-15,000	1	....	7	168	1,129,000	23.2
	Soldado, 1955*	5,100-11,000	139	78	69	51,010	225,760,000	24.8
	Area 2:	1,000-10,626						
	Area IV Guapo, 1913-1922		1	34	110	511	32,417,000	25.5-16.9
	Parry Lands (1-5), 1913-1918		16	40	148	774	33,250,000	30.2-10.7
	Point Fortin Central and West, 1907-1916		16	25	149	639	30,370,000	45.1-20.4
	Area 3:							
	Brighton, 1908†	700-7,500	28	179	225	4,264	64,098,000	32.8
	Area 4:	460-12,718						
	Palo Seco, 1926-1929		....	8	61	27	1,565,000	22.1
	Palo Seco-Erin, 1915-1926		81	316	400	10,061	69,495,000	21.2
	Area 5:	500-11,000						
	Forest Reserve, 1913		59	594	965	16,657	307,002,000	23.0
	Fyzabad, 1918-1920		21	215	313	5,231	148,030,000	20.8-32.7
	Point Fortin East, 1929		4	56	50	2,304	20,011,000	34.4
	Area 6:	288-14,000						
	Coora-Quarry, 1936		19	163	356	3,260	76,547,000	24.1-20.4
	Area 7:							
	Oropouche, 1944		4	9	27	643	2,831,000	38.6-19.8

WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
TRINIDAD & TOBAGO—Continued	Area 8:	1,300-11,067						
	Barrackpore, 1911		15	23	135	1,725	22,009,000	41.2-26.9
	Penal, 1936		31	58	84	3,106	54,227,000	55.7-37.5
	Wilson, 1936		4	32	33	531	18,396,000	26.4
	Area 9:	1,400- 9,693						
	Catshill, 1950		4	51	18	1,345	19,534,000	46.3-38.3
	Moruga-North & West, 1956		1	37	71	376	8,967,000	31.4-25.0
	Trinity, 1956		1	51	20	788	12,575,000	32.2
	Area 10:							
	Guayaguayare, 1903	500-10,750	12	191	314	7,758	68,271,000	33.7
	Area 11:							
	Galeota, 1972*	1,100- 6,304	1	16		1,942	118,000	
	Teak, 1972*	7,250-15,191	11		1	19,374	3,526,000	29.3
	Others	3,000- 7,560	49	202	972	3,527	99,178,000 ^a	40.7-14.1
Total Trinidad and Tobago			518	2,378	4,528	136,021	1,319,312,000	
*Offshore. †Partly Offshore.								
(a) Others cumulative have changed as some fields were taken out and included under the Area Totals.								
TUNISIA	Aquitaine:							
	Douleb, 1966; Tamesmida, 1968	3,300- 4,950	2			3,716	5,827,340	41.6-43.0
	ENI:							
	Fl Borma, 1964	8,250- 8,900	39		11	73,100	147,500,000	41.1
	Others			1	2	100	106,500	
Total			41	1	13	76,916	153,433,840	
TURKEY	Adiyaman, 1971	5,600		12	2	2,591	1,076,979	26.6
	Barbes, 1972	7,200	1			1,199	218,240	29.6
	Beykan, 1964	5,200		8	3	10,963	28,229,249	33.2
	Garzan-Ger., 1951	5,100		38	32	3,192	25,261,966	25.0
	Kahla, 1958	3,500		5	1	1,570	3,047,777	11.5
	Kayakoy, 1961	6,000		6	7	2,982	6,671,954	38.2
	Kayakoy West, 1964	5,300	1	4	1	4,971	8,728,536	35.0
	Katin, 1971	6,800	2		1	828	251,696	29.3
	Kürkan, 1963	4,500		6	6	10,238	20,487,425	31.4
	Kürkan South, 1967	5,500	3		1	1,567	2,573,586	34.2
	Magrip, 1961	6,400		13	12	1,312	10,571,297	19.3
	Malatepe, 1970	5,000	1	2		1,220	1,021,508	32.7
	Piyanko, 1968	6,300	1		3	843	880,890	35.5
	Raman, 1940	4,500		24	23	2,599	19,856,271	18.5
	Raman West, 1961	4,300		126	12	5,362	16,369,805	13.4
	Silivanka, 1962	7,500		14	1	1,746	2,388,339	19.6
	Sahaban, 1966	5,400	3		1	1,463	6,148,306	34.4
	Selmo, 1964	5,800	2	9	1	10,109	29,852,901	34.2
	Others		2	6	8	297	2,444,224	
Total			16	274	115	65,052	186,080,949	
UNITED KINGDOM	Bothamsall, 1958	3,300		9	7	320	1,835,000	
	Egmanton, 1955	3,250		14	37	273	2,855,000	
	Gainsborough, 1959	3,200- 4,600		25	20	518	2,049,000	
	Kimmeridge, 1959	1,800		1	2	376	1,298,000	
	Others			8	10	243	10,033	
Total				56	74	1,730	18,070,000	
VENEZUELA	STATE OF ANZOATEGUI							
	Araibet, 1954	8,970-10,516	6		31	1,320	25,236,709	42.6
	Boca, 1951	9,500	16	1	62	3,571	66,733,111	35.6
	Caico Seco, 1946	6,500- 7,300	13		64	4,550	41,167,999	34.8
	Chimire, 1948-1952	7,000- 7,200	62		141	13,610	331,027,073	35.5
	Dacion, 1957	6,700	84	10	28	9,915	162,202,696	19.9
	Elias, 1954	5,100- 6,470	31	19	54	17,920	49,779,024	38.9
	El Roble, 1939	3,500-11,500	14		21	1,020	35,817,216	49.9
	Guara, 1946	5,000-10,000	94	103	194	26,389	473,083,942	26.3
	Guaria, 1940	5,000-10,000	8		52	1,739	41,856,675	49.5
	Guico, 1944	4,500- 7,000	23	6	50	2,634	80,990,786	27.1
	Inca, 1948	7,250	8		18	2,356	12,044,627	38.1
	Junta, 1954	6,720	1	8	13	1,434	21,910,122	20.8
	La Ceiba, 1946	9,480	20	1	11	7,926	21,897,184	41.5
	La Ceibita, 1963	9,870- 9,878	25		20	15,406	49,822,059	42.8
	Leona, 1938	2,200-12,800	32	70	107	11,336	121,922,697	22.0
	Mapiri Este, 1952	9,500	2		14	1,283	22,244,136	35.9
	Mata, 1954	9,000-12,500	134	14	277	47,230	412,079,612	33.9
	Me:ey, 1937	5,400- 5,700	9	263	113	20,273	156,367,957	11.4
	Nipa, 1945	6,000- 8,500	134	40	262	27,905	411,413,233	28.4
	Oficina, 1937	5,900	69	187	373	36,392	616,823,766	21.3
	Oscurote, 1952	9,513	26	16	42	10,906	103,180,754	19.7
	Rosa, 1958	1,250-11,412			3	1,332	6,307,003	50.8
	San Joaquin, 1939	6,560	24		48	2,744	75,585,369	47.5
	Santa Ana, 1936	8,500	37		47	6,997	81,850,318	37.9
	Santa Rosa, 1941	8,500	113		56	35,934	276,253,872	44.7
	Solo, 1950	9,500	41		174	7,615	154,685,316	37.3

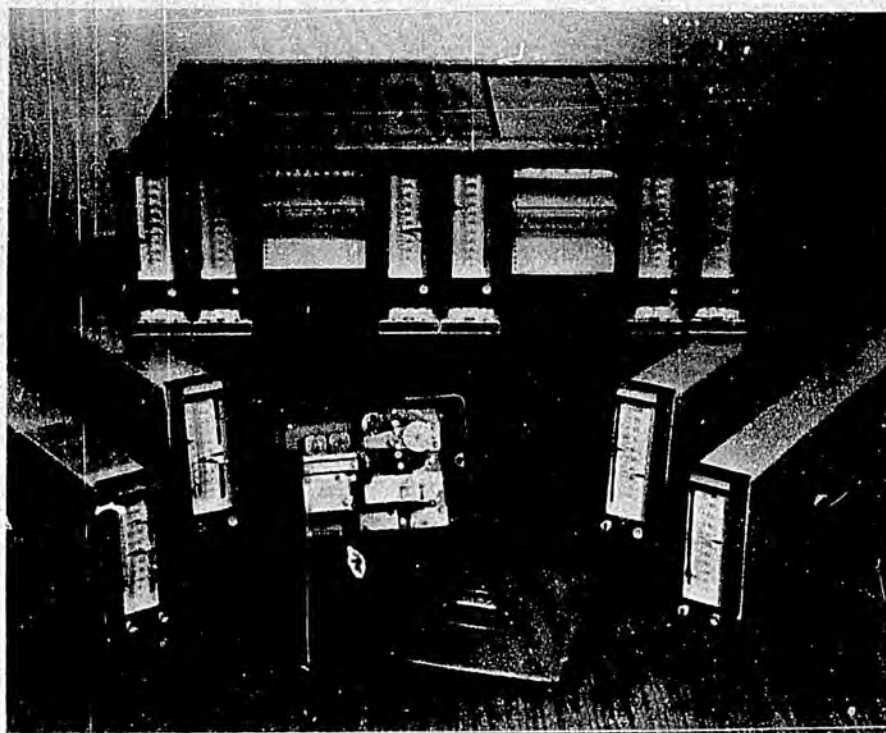
WORLDWIDE PRODUCTION	Name of field and discovery date	Depth (ft)	No. of Wells			Production in bbl		Gravity °API
			Flowing	Pumping	Shut-in	Daily avg. 1st 6 mo. 1972	Cumulative 7/1/72	
VENEZUELA— (Continued)	Tapuco, 1953	10,000	4	....	23	2,447	23,891,327	36.8
	Yopales, 1937	4,600	17	46	66	11,759	83,367,066	22.5
	Zanjas, 1958	13,270	7	....	7	4,651	17,147,429	32.8
	Zapatos, 1955	11,500	21	....	39	15,581	104,133,702	35.8
	Zorro, 1953	11,100	13	....	13	7,211	53,823,812	25.4
	Zulus, 1957	12,710	4	....	13	2,007	13,359,246	35.0
	Zumo, 1954	9,200	9	16	10	4,924	55,156,470	17.8
	Others		74	33	284	17,046	181,361,810	....
	Total		1,175	833	2,730	385,363	4,384,524,118	
	FEDERAL TERRITORY OF AMACURO							
	Tucupita, 1945	5,600	12	15	39	3,957	44,002,774	16.8
	Others		....	....	25	....	57,415,540	....
	Total		12	15	64	3,957	101,418,314	
	STATE OF MONAGAS							
	Acema, 1960	12,520-13,750	42	4	32	23,850	38,609,132	26.3
	Aguaguay, 1955	8,100-13,400	25	....	35	14,369	69,289,739	38.7
	Jobo, 1956	3,600-4,000	....	61	66	32,490	30,698,652	12.3
	Morichal, 1958	3,312	....	109	61	16,783	92,156,033	10.7
	Oritupano, 1950	7,657	9	66	34	17,779	87,825,075	20.0
	Orocual, 1933	2,954	12	6	19	3,577	14,410,441	20.9
	Pirital, 1958	450-1,100	....	58	7	3,882	16,163,585	16.8
	Quiriguire, 1928	7,000-7,200	....	377	87	19,996	711,895,138	16.4
	Santa Barbara, 1941	5,020-6,500	108	15	216	4,757	154,826,805	27.5
	Tacat, 1953	1,830-3,668	....	52	76	2,889	34,269,221	16.9
	Temblador, 1936	3,500-4,500	38	2	9	4,811	94,119,831	20.3
	Others		37	....	322	5,564	394,723,412	....
	Total		271	750	964	150,747	1,738,987,067	
	STATE OF GUARICO							
	Las Mercedes, 1942	1,200-4,500	30	12	113	1,388	125,869,817	29.1
	Ruiz, 1949	4,450	28	1	11	956	30,021,542	32.4
	Budare, 1958	4,523	23	....	6	19,454	20,168,225	31.3
	Others		30	60	147	2,753	56,656,263	....
	Total		111	73	277	24,551	242,715,847	
	STATE OF BARINAS							
	Hato Viejo, 1961	9,543	2	7	3	5,458	26,261,739	26.6
	Maporal, 1957	10,944	....	3	1	1,669	6,010,659	28.6
	Silvan, 1949	10,862	2	6	....	3,664	34,203,146	27.7
	Silvestre, 1948	8,850	1	21	17	11,490	98,725,003	25.8
	Sinco, 1953	8,500-9,100	7	34	27	23,714	185,856,407	25.6
	Others		6	4	7	8,361	6,822,005	....
	Total		18	75	55	54,356	357,878,359	
	STATE OF FALCON							
	Tiguaje, 1953	3,300	1	16	5	798	7,965,296	27.2
	Others		....	40	70	351	96,913,848	....
	Total		1	56	75	1,149	104,879,144	
	STATE OF ZULIA							
	Bachaquero, 1930	3,444	584	1,370	1,153	583,058	4,273,896,910	23.6
	Barua, 1958	10,500	4	1	1	4,698	9,726,949	20.4
	Buscan, 1946	6,500-7,500	....	168	195	43,933	444,187,230	10.3
	Cabimas, 1917	2,200	185	314	318	64,431	1,195,408,549	23.8
	Ceutro, 1957	12,568	79	1	38	108,504	261,844,525	30.8
	Cruces Manueles, 1916	300-8,000	10	41	46	4,050	160,008,814	31.7
	Ceuta, 1956	9,600-11,000	49	5	37	62,326	184,263,276	30.8
	La Concepción, 1953	3,148-8,000	3	67	45	5,547	110,549,839	35.4
	Lago, 1958	11,450	24	....	14	49,808	92,390,080	31.4
	Lagunillas, 1926	3,000	1,132	1,483	1,251	800,226	7,858,462,050	25.3
	Lama, 1957	8,320	219	2	88	308,049	1,618,442,703	32.5
	Lamar, 1958	13,003	69	....	30	140,000	567,563,588	33.8
	La Paz, 1925	4,268-8,000	48	29	29	21,117	766,902,401	32.5
	Los Claros, 1960	9,328	....	9	5	4,782	25,703,356	10.3
	Mara, 1945	5,248	27	21	47	10,812	368,186,884	27.4
	Mene Grande, 1914	4,132	1	303	164	11,980	570,399,155	18.3
	Sibucara, 1948	13,451	2	....	3	1,882	38,421,055	34.7
	Tarra West, 1947	4,250-5,500	6	11	17	3,133	61,039,609	39.0
	Tia Juana, 1928	3,000	310	1,255	509	303,425	2,616,950,221	19.1
	Others		18	5	24	14,299	18,969,012	....
	Total		2,770	5,085	4,014	2,546,060	21,243,316,206	
	Venezuela Total		4,358	6,887	8,179	3,166,183	28,173,719,655	

ZAIRE REPUBLIC

GC-1X, 1970*
*Offshore—Not yet on production.

11,825 2

Remote-mounted controller offered



PNEUMATIC CONTROLLER makes efficient, compact package for services requiring rugged, weatherproof unit.

A NEW Model 138 remote-mounted pneumatic controller has been announced that reportedly provides an efficient and compact package for applications requiring a rugged, weatherproof unit with advanced features. The new Foxboro controller features the rugged, weatherproof/dustproof universal case similar to that used for the maker's field transmitters.

An advantage of the remote-mounted controller is that it eliminates the unacceptable pneumatic transmission lags that occur when distances between the process and control panel are great. For operator convenience, the Model 138 unit is used with a panel-mounted display and control station that allows full use of controller functions.

When maintenance is needed, the circuit board and components can be easily removed without affecting manual operation of the loop.

Foxboro Co., Foxboro, Mass. 02035.

Heavy machinery, engine grouting data available

EPOXY RESIN GROUT, tradenamed 604 Machine Bond for grouting heavy machinery and engines to resist vibration, chemical attack, high-torque loads, and other stresses in such installations is detailed in this four-page brochure, yours on request. Uses, surface preparation, forming, mixing and placing, temperature factors, clean up, health precautions, and estimating and ordering are explained in the brochure.

Carter-Waters Corp., 2440 Pennway, Kansas City, Mo. 64108.

Gate valves have seats that can be field re-energized

GATE VALVES with seats that may be re-energized in the field are described and detailed in this free 14-page catalog, yours on request. OCT gate valves are said to eliminate the field performance and maintenance problems usually associated with pro-

duction gate valves. Features include blocking and bleeding in either open or closed position; nonrotating rising stem that places stem threads on outside of the valve; compact size that permits use of closer tubing center, smaller casing, and wellhead; light floating seats and gates that reportedly eliminate pressure locking; non-lubricated design seals; prolonged packing life; and needle bearings to more evenly distribute load. The valves, for multiple completion, come available in 1 3/4 to 4-in. sizes in 2,000 to 5,000 psi wp for duals, triples, and quadruples. Also covered in the catalog are 10,000 and 15,000 psi wp production gate valves.

Oil Center Tool Div., FMC Corp., Box 3091, Houston, Tex. 77001.

Chlorination guide available

THIS CHLORINATION GUIDE, Bulletin 922, yours on request may help you plan and install chlorination systems for potable and process-water

treatment and for industrial wastes treatment. The bulletin's 16 pages of information include a sizing guide, definitions, typical chlorination installation layout, data on water and waste treatment, a planning and check-off table, and describes some Advance chlorination system.

Capital Controls Co., Advance Lane, Colmar, Pa. 18915.

Gaskets may cut downtime

DOWNTIME in refineries, petrochemical plants, and pipeline pumping and compressor stations for gasket replacement may be reduced with new Topog-E rubber gaskets which are molded (not cut out or stamped) from a specifically formulated material suitable for 180 psi and 380° F. service. The maker says they will positively stop leaks since they conform to the topography of both surfaces of

For more facts, address inquiry coupon directly to the manufacturer.

Drilling activity highest ever in Black Warrior

ABOUT a year ago this page noted that aggressive exploration was under way in the Black Warrior basin of northeastern Mississippi and northwestern Alabama.

This widespread campaign has not let up and success has been reported at several wildcats. Indications are that the basin will enjoy continued wildcatting and field-development work in the months to come as natural gas becomes more and more a rare commodity.

Dual success. Both states fared well in the current Black Warrior basin exploratory program.

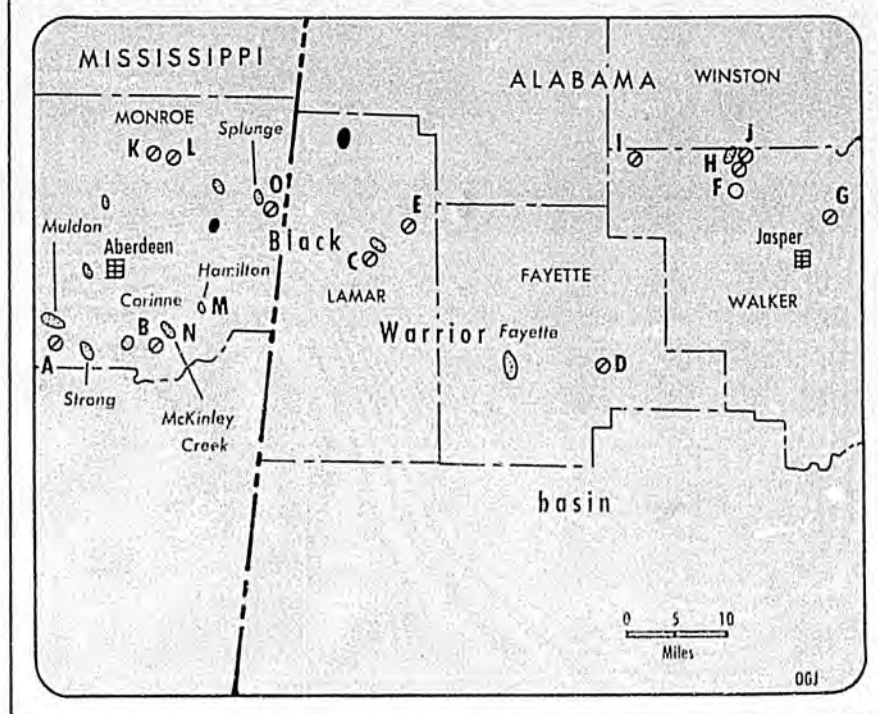
Newest successes are two Monroe County wildcats in northeastern Mississippi. Gibraltar Oil Corp. and Ladner & Hildebrand 1 R. J. Lilley et al. unit, 3-16s-6e, 2 miles south of Muldon field (A on map), drilled to 5,800 ft. Core and logs indicated 30 ft of gas sand in the Sanders Mississippian sand topped at 5,712 ft. Also, there were shows logged in the Carter Mississippian sand and in two basal Pennsylvanian sands.

About 1 mile northeast of Corinne field, the same operators have found gas shows in the Pennsylvanian sand. This sand has indicated production in Corinne field, but is not being produced. New prospect is the 1 Turnage et al. in SE NW 6-16s-8e, 5 miles southwest of Hamilton (B on map). This well is reportedly across the fault from Corinne, paving the way for a new reservoir.

In a strong program. There are more wells drilling in the Black Warrior basin today than at any time.

A new Paleozoic test has rigged up in the Fairview area of Lamar County in Alabama at Skelton Operating Co. Inc. 1 J.P. Barnes unit, SE SW 13-14s-15w, 1½ miles south of an unnamed gas area. Target is 3,100 ft with M&C Drilling Co. holding contract (C on map). At D on map, Northwest Gas & Oil Co. Ltd. 11-1 Cleveland Lumber, 11-16s-11w, is an apparent Paleozoic discovery. In Lamar County (E on map), Oscar O. Hembree et al. 1 John Raymond Young, 33-13s-14w, is an active deep test. Lamar Properties 1 Moss-Mc-

Black Warrior campaign rolls on



Cormick Mineral Co. 5-2 is drilling to 2,300 ft in Walker County (F on map). Shenandoah Oil Corp. 1 First National Bank 25-13, 25-13s-7w, is shut in (G on map). The 1 First National Bank 29-11 in 29-12s-8w is also shut in (H on map). In Winston County (I on map), Oil & Gas Properties Inc. 9-11 McCoy is a Paleozoic location in 9-12s-10w. P. W. Pitzer et al. A-1 Worthington Est. 4-4, 4-12s-8w (J on map), is also a Paleozoic location.

Four Mile Creek field (K on map) has two active locations, both Pruet & Hughes Co. The 1 Myers (K on map) is in 19-12s-18w and the 1 Tubbs (L on map) is in 20-12s-18w. Ladner & Hildebrand et al. 1 Seeley et al. (M on map) is drilling in Hamilton field, 11-15s-18w. McKinley Creek field (N on map) has an active spot at Ladner, Stewart, and Gibraltar 1 West et al., 21-15s-18w. Well flowed 1,500 Mcfd on choke and tested 15 b/d. In Splunge field, (O on map), Pruet & Hughes have two active wells, 24-12s-17w at 1 Crowe unit 25-3 and 1 Weyerhaeuser Co. Unit 18-13 in 18-12s-16w.

Undoubtedly some new oil and/or gas discoveries will result from this active hydrocarbon hunt in one of the nation's most neglected basins. Geologists for years have thought this Paleozoic arena would some day come into its own. Frankly, the basin just hasn't had enough holes punched in it yet. McKinley Creek is a good example of what the basin holds. The field discovery well, Ladner & Stewart and Gibraltar 1 Nevins, 20-15s-18w, a dual well, flowed from both Nevins and Lewis sands. Upper flow was 1,285 Mcfd, lower 1,300 Mcfd. Later, a Carter sand well was added to the field with development continuing.

The Alabama portion of the Black Warrior basin has its largest gas well yet at a Lamar County discovery.

Skelton Operating Co. Inc. of Laurel, Miss., reports that the 3 S. H. Gilmer in SW NE 18 14s-14w, northwest offset to the Fairview field discovery well, flowed 1,207 Mcfd on ¼-in. choke from perforations in the Mississippian Carter sand at 2,442-48 ft. Tubing pressure was 860 psi.

Worldwide crude production

(Daily average in thousands of bbl)

	Oct. 1973	Sept.* 1973	Daily prod. 1972	Daily prod. 1973	10-month average Daily prod. 1973	Change from Vol. %
WESTERN HEMISPHERE						
Argentina	415.0	414.9	430.0	417.0	— 13.0	— 3.0
Bolivia	45.0	45.0	43.0	47.0	4.0	9.3
Brazil	169.0	168.0	165.0	168.0	3.0	1.8
Canada	1,812.0	1,745.0	1,505.0	1,791.0	286.0	19.0
Chile	31.0	31.0	34.0	32.0	— 2.0	— 5.9
Colombia	200.0	190.0	199.0	196.0	— 3.0	— 1.5
Ecuador	210.0	210.0	51.0	203.0	152.0	298.0
Mexico	480.0	470.0	441.0	462.0	21.0	4.8
Peru	67.0	67.0	66.0	67.0	1.0	1.5
Trinidad	160.0	165.0	141.0	164.0	23.0	16.3
United States	9,123.0	9,149.0	1,463.0	9,208.0	—255.0	— 2.7
Venezuela	3,371.0	3,387.1	3,208.0	3,365.0	157.0	4.9
TOTAL	16,083.0	16,042.0	15,746.0	16,120.0	374.0	2.4
EASTERN EUROPE						
Austria	48.0	48.0	47.2	49.2	2.0	4.3
Denmark	4.0	4.0	3.0	4.0	1.0	33.3
France	27.0	27.0	31.0	27.0	— 4.0	— 12.9
West Germany	128.0	128.5	139.0	130.0	— 9.0	— 6.5
Italy	15.0	15.0	22.0	15.0	— 7.0	— 31.8
Netherlands	27.0	34.0	31.0	30.0	— 1.0	— 3.2
Norway	38.0	40.6	35.0	36.0	1.0	2.9
Spain	20.0	20.0	3.0	15.0	12.0	400.0
United Kingdom	2.0	2.0	2.0	2.0	—	—
Yugoslavia	70.0	70.0	64.0	68.0	4.0	6.3
TOTAL	379.0	389.1	377.2	376.2	— 1.0	— 0.3
MIDDLE EAST						
Abu Dhabi	1,340.0	1,381.0	1,032.0	1,342.0	310.0	30.0
Bahrain	68.1	68.0	71.0	68.0	— 3.0	— 4.2
Dubai	214.0	273.0	137.0	236.0	99.0	72.3
Iran	5,978.0	5,793.0	4,905.0	5,825.0	920.0	18.8
Iraq	1,797.0	2,167.0	1,421.0	1,949.0	528.0	37.2
Israel	20.0	100.0	100.0	100.0	—	—
Kuwait	3,058.4	3,520.3	3,291.0	3,115.0	—176.0	— 5.3
Oman	304.0	302.1	282.0	291.0	9.0	3.2
Qatar	589.0	608.3	463.0	591.0	128.0	27.6
Saudi Arabia	7,797.9	8,574.2	5,883.0	7,840.0	1,957.0	33.3
Syria	40.0	125.0	119.0	114.0	— 5.0	— 4.2
Turkey	65.0	65.0	65.0	64.0	— 1.0	— 1.5
TOTAL	21,280.4	22,976.9	17,769.0	21,535.0	3,766.0	21.2
ASIA-PACIFIC						
Afghanistan	—	—	—	—	—	—
Australia	414.0	432.0	324.0	518.0	94.0	29.0
Burma	20.0	20.0	19.0	20.0	1.0	5.3
Brunei-Malaysia	330.0	325.0	272.0	316.0	44.0	16.2
India	148.0	148.0	150.0	148.0	— 2.0	— 1.3
Indonesia	2,406.0	1,338.0	1,046.0	1,305.0	259.0	24.8
Japan	15.0	15.0	15.0	15.0	—	—
Pakistan	8.0	8.0	8.0	8.0	—	—
Taiwan	2.0	2.0	2.0	2.0	—	—
Thailand	0.2	0.2	0.2	0.2	—	—
TOTAL	2,343.2	2,288.2	1,836.2	2,232.2	396.0	21.6
AFRICA						
Algeria	1,020.0	1,100.0	1,060.0	1,098.0	38.0	3.6
Angola	15.0	15.0	12.0	14.0	2.0	16.7
Cabinda	150.0	140.0	125.0	136.0	11.0	8.8
Congo	50.0	45.0	6.0	40.0	34.0	566.7
Egypt	60.0	209.0	216.0	194.0	— 22.0	— 10.2
Gabon	155.0	155.0	125.0	143.0	18.0	14.4
Libya	2,383.7	2,286.0	2,219.0	2,272.0	53.0	2.4
Morocco	0.3	0.3	0.3	0.3	—	—
Nigeria	2,190.4	2,100.0	1,799.0	2,011.0	212.0	11.8
Tunisia	82.0	82.0	83.0	83.0	—	—
TOTAL	6,106.4	6,132.3	5,645.3	5,991.3	346.0	6.1
COMMUNIST						
China	630.0	630.0	580.0	630.0	50.0	8.6
Romania	275.0	275.0	275.0	275.0	—	—
U.S.S.R.	8,689.0	8,663.0	7,881.0	8,356.0	475.0	6.0
Other	110.0	110.0	100.0	110.0	10.0	10.0
TOTAL	9,704.0	9,678.0	8,836.0	9,371.0	535.0	6.1
WORLD TOTAL	55,896.0	57,506.5	50,209.8	55,625.0	5,416.0	10.8

*Figures adjusted.

Gas production

	Oct. *73	Sept. *73	Cum. 1973
(billions cu ft)			
Argentina	21.7	23.6	198.5
Bolivia	12.0	12.1	124.6
Brazil	2.9	3.2	40.4
Canada	259.7	244.3	2,698.1
Chile	19.7	21.1	213.5
Colombia	10.4	9.5	106.3
Ecuador	0.4	0.5	5.5
Mexico	52.8	54.0	570.3
Peru	6.7	7.0	52.2
Trinidad	11.2	9.2	114.2
United States	1,900.1	1,811.9	19,052.5
Venezuela	140.9	141.1	1,401.0
TOTAL	2,438.5	2,337.5	24,577.1
Austria	6.7	5.2	60.8
Denmark	—	—	—
France	18.9	17.1	215.6
West Germany	50.4	46.2	479.1
Italy	46.7	42.1	398.1
Netherlands	200.7	193.9	2,248.9
Norway	—	—	—
Spain	—	—	—
United Kingdom	80.1	76.8	959.9
Yugoslavia	4.9	3.6	57.8
TOTAL	408.4	384.9	4,420.2
Abu Dhabi	—	—	—
Bahrain	1.0	1.1	18.1
Dubai	—	—	—
Iran	142.6	143.7	1,401.4
Iraq	11.7	12.7	132.1
Israel	0.1	0.1	2.9
Kuwait	0.2	0.2	50.3
Oman	—	—	—
Qatar	0.0	0.1	7.2
Saudi Arabia	—	—	—
Syria	—	—	—
Turkey	—	—	—
TOTAL	155.6	157.9	1,612.0
Afghanistan	3.9	4.1	63.4
Australia	16.0	14.2	121.6
Burma	0.3	0.4	5.7
Brunei-Malaysia	—	—	—
India	1.0	1.1	15.1
Indonesia	7.6	8.9	108.9
Japan	7.2	6.1	72.0
Pakistan	7.1	8.2	113.3
Taiwan	2.0	1.9	24.6
Thailand	—	—	—
TOTAL	45.1	44.9	524.6
Algeria	1.7	1.6	79.5
Angola	1.9	3.2	20.4
Cabinda	—	—	—
Congo	0.2	0.4	2.3
Egypt	2.7	3.1	25.5
Gabon	0.0	0.1	1.5
Libya	4.9	6.2	33.3
Morocco	1.7	2.5	33.6
Nigeria	4.2	4.9	51.7
Tunisia	4.1	5.4	11.6
TOTAL	21.4	27.4	259.4
China	13.0	12.4	133.3
Romania	110.4	111.2	1,114.8
U.S.S.R.	673.2	653.1	6,815.4
Other	60.9	51.7	542.6
TOTAL	857.5	828.4	8,606.1
WORLD TOTAL	3,926.5	3,781.0	39,999.4

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