ESTIMATED PRODUCTIVE CAPACITIES

OF

CRUDE OIL, NATURAL GAS

AND NATURAL GAS LIQUIDS

IN THE

UNITED STATES

(1965-1970)

A REPORT BY THE

NATIONAL PETROLEUM COUNCIL'S

COMMITTEE ON FUTURE PETROLEUM

AND GAS PRODUCING CAPABILITIES

J. Howard Rambin, Jr., Chairman

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CHAPTER 1

INTRODUCTION

In his letter of February 3, 1965, to the Chairman of the National Petroleum Council, the then Assistant Secretary of the Interior, Hon. John M. Kelly, stated that, with the growing emphasis on planning for the future by Government and by private industry, projections of probable future events are being made more frequently and with greater attention to trend analysis. One of the key series of data on oil and gas throughout the years, said Mr. Kelly, has been that which measures the industry's capacity to produce these hydrocarbons. In view of the importance of knowing present and future capabilities to produce petroleum in the United States, Mr. Kelly requested on behalf of the Department of the Interior, that the National Petroleum Council, using its previous studies as a basis, make projections to the year 1970 of the capacity of the United States' oil and gas industry to produce crude oil, natural gas and natural gas liquids.

Responding to this request, the Council, at its meeting on March 25, 1965, unanimously agreed to undertake such a study and the Committee on Future Petroleum and Gas Producing Capabilities, under the Chairmanship of J. Howard Rambin, Jr., Chairman of the Board, Texaco Inc., was appointed to develop the necessary estimates and report.

The Department of the Interior, in calling for this specific report, expressed the need for an improved and more dependable tool for planning purposes than now is readily available to it for its use in continuing defense and other studies which it is called upon to prepare or evaluate, both for itself and for other Government agencies. Interior felt that future productive capacity projections, based upon the comprehensive knowledge and technical excellence available within the petroleum industry, would give the Government a landmark to assist in the analysis of future events as they might be expected to affect this Nation's security.

The estimates of productive capacity contained herein represent the volumes of petroleum hydrocarbons which could potentially be produced within the United States. These estimates

are made without any reference to limitations on production resulting from subcapacity equipment in connection with the oil and gas wells, plant facilities or market outlets, as further discussed in Chapter 2.

This report updates a report of the National Petroleum Council issued on March 25, 1965, which included estimates of productive capacities as of January 1, 1964. The current report brings these productive capacity estimates forward to January 1, 1965, giving consideration to all wells drilled to that date. In addition, this report projects estimated productive capacities for crude oil, natural gas and natural gas liquids, as of January 1 of each year, 1966 to 1970 inclusive, responding to the request of the Department of the Interior for estimated future productive capacities.

The productive capacities for these hydrocarbons, as estimated by this Committee, are consistent conceptually with estimates prepared by corresponding committees of the National Petroleum Council in prior studies. It must be recognized that such estimates cannot be exact and that they involve the exercise of informed judgment applied to the basic facts available.

The extensive task of assembling the background data and estimates for this report was carried out during the latter part of 1965, and early 1966, by two working subgroups of the Committee on Future Petroleum and Gas Producing Capabilities. The Coordinating Subcommittee for Future Crude Oil Producing Capabilities, under the Chairmanship of Mr. Henry L. Waszkowski, Jr., Vice President of the Producing Department, International Division, Mobil Oil Corporation, consisted of 10 members whose firms represent geographically all crude oil producing provinces of the United States. The Coordinating Subcommittee for Future Gas and Natural Gas Liquids Producing Capabilities, under the Chairmanship of Mr. C. E. Turner, Manager of the Economics Division, Exploration and Production Department, Phillips Petroleum Company, consisted of 14 members, likewise representative of all gas producing regions of the United States.

The members of the Subcommittees were chosen because of their expertise and knowledge regarding the matters under study in specific areas. Each member directed the preparation of all necessary work sheets and data for his assigned area. The PAD District and U. S. totals were then prepared from these individual

regional analyses. Accordingly, the estimates contained in this report reflect the best judgment of oil and gas industry specialists who have studied this particular subject for many years.

The membership of the Committee and its two Subcommittees is shown in the Appendices.

CHAPTER 2

THE CONCEPT OF PRODUCTIVE CAPACITY

A. Definitions Used in Study

The Coordinating Subcommittees adopted the following definitions of Crude Oil, Natural Gas and Natural Gas Liquids Productive Capacities:

1. DEFINITION OF CRUDE OIL AND NATURAL GAS PRODUCTIVE CAPACITIES

For purposes of this study, productive capacity for crude oil and natural gas, on any date, is defined as the maximum daily rates that could be produced from existing oil and gas wells with the condition that such rates would not cause loss of recoverable reserves. These capacities are not limited by lack of markets, lack of transportation or storage facilities, or inadequacies of producing or processing equipment. The capacity estimates for any given date include the capabilities of all wells drilled prior to that date but do not include the effect of any future drilling of wells or initiation of improved recovery techniques and would decline as current reserves become depleted. Since it was required to predict future capabilities in this study, it was necessary to estimate wells to be drilled and improved recovery projects to be initiated in the future and the effects of these estimates are included in the projections of productive capacity.

Crude oil productive capacity does not include lease condensate which is included in natural gas liquids productive

capacity. Natural gas is composed of three types [1]; i.e., (a) gas associated with crude oil in the reservoir, (b) gas in reservoirs that contain no oil, and (c) gas in solution with crude oil. The estimated productive capacity is the total of the individually estimated capacities of associated, non-associated and dissolved.

The productive capacity of associated gas is affected by crude oil producing activities. Non-associated gas production and productive capacity estimates are completely independent of crude oil operations. However, the dissolved gas productive capacity is solely dependent on the crude oil capacity.

The estimated productive capacities in this report include natural gas from reservoirs now being cycled, as well as gas from fields which are presently not producing. The capacity estimates, however, do not include any gas that may be available from underground storage reservoirs.

1/ The Committee has adopted the definitions used by the Committee on Natural Gas Reserves of the American Gas Association as follows:

(a) Associated gas: Free gas in contact with crude oil in the reservoir where the production of gas is significantly affected by the production of crude oil.

(b) Non-associated gas: Free natural gas not in contact with crude oil in the reservoir; and free natural gas in contact with crude oil where the production of such gas is not significantly affected by the production of crude oil.

(c) Dissolved gas: Gas in solution with crude oil in the reservoir.

2. DEFINITION OF NATURAL GAS LIQUIDS PRODUCTIVE CAPACITY

Natural gas liquids productive capacity shown in this report is the amount of hydrocarbon liquids that would be produced coincident with the estimated productive capacity of natural gas. These gas liquids are either in gaseous form or in solution in crude oil and are recovered at the surface as liquids by separation from natural gas by such processes as condensation and absorption in field separators, gasoline plants and other surface equipment. Since natural gas liquids are not produced as such from underground reservoirs but become available solely by separation from the produced natural gas, their rate of availability depends directly on the rate of production of oil and gas from the crude oil and natural gas reservoirs. This capability estimate is not limited by lack of processing facilities, and it is emphasized that adequate facilities would ultimately be required to effect their removal from the produced natural gas.

The term natural gas liquids (NGL) as used and defined in this report includes natural gasoline, liquefied petroleum gases and condensate 2/. Estimates of NGL capacity are given in this report for each of the three types of natural gas: associated, non-associated and dissolved.

2/ Condensate is that portion of NGL that is recoverable from separators wherever located.

Since the NGL productive capacity is solely dependent upon the productive capacity of natural gas, the conditions stated herein for the gas are also applicable to the NGL.

B. Statement of Concept of Productive Capacity

United States productive capacity is an estimate of the crude oil, natural gas, and natural gas liquids that could be produced on any given date from all then existing oil and gas wells located in the United States without the loss of recoverable reserves. As suggested in the Introduction, these productive capacities should not be confused with actual production rates or with the amount of oil, natural gas and natural gas liquids that could be produced on short notice with present facilities. The concept of productive capacity, then, represents potential production rather than immediate or actual production.

Since this report includes projections of productive capacity until January 1, 1970, the capacities indicated are those that could be produced on the particular date stated within the period. Thus productive capacity as treated herein results from a continuing program of exploration, development, and expansion of processing facilities. The report takes into consideration such factors as estimated decline of production rates of existing oil and gas wells, together with estimated rates of drilling activity[3/] estimated additions to proved reserves, improved recovery techniques and remedial measures. It should be clearly understood that the maintenance of U. S. productive capacity beyond any point in time is directly dependent upon the continuation of such a program of exploration and development. (See also Chapter 5, Section C.)

3/ In estimating future productive capacities the Coordinating Subcommittees assumed a future drilling rate based on historical trends and other factors and it must be recognized that this assumed rate is subject to considerable variation resulting from a variety of circumstances over the period of the projection. However, a variation of 10% greater or lower within any one year of the period would change the estimates of productive capacities by somewhat less than 1% up or down in that year.

While some reservoirs are capable of sustained production for a period of time, the total U. S. capacity would commence to decline immediately in the absence of continuing exploration and development.

In those states where governmental bodies impose limitations on production to prevent waste, the production facilities of certain wells and fields are designed to handle only the approximate authorized volumes. Consequently, during periods when allowable production is increased, those wells and fields may produce less than the allowable until production facilities are expanded. In these same states, some wells are incapable of producing their allowables because they are producing at capacity which is continually declining. Other wells in these states have productive capacities in excess of their allowables and are equipped to produce increased volumes for a sustained period. Thus, allowables and the ability of wells to produce them have no direct relationship with the productive capacities set forth in this report.

C. Productive Capacity Under Emergency Conditions

As previously defined, the capacity of wells has been estimated without regard to facilities, transportation, and market limitations, and consequently part of the indicated capacity is not normally available on short notice. In an extreme emergency situation requiring a rapid increase in production, some of the limitations referred to in the definition of productive capacity could be set aside, particularly for the short run. For example, volumes from certain areas could be increased so as to exceed the productive capacity set forth in this report by lifting production restrictions related to conservation. Of course, long continued disregard of conservation measures or good producing practices would severely damage the nation's reserves.

On the other hand, should a particular national emergency impel production rates to exceed the capacities shown in this report for a long period of time, it would then be necessary to re-examine basic policies applicable to the petroleum industry to determine whether capacities could be increased through expanded exploration and development programs.

The projections of productive capacities included in this report are estimates based upon the assumptions set forth in Chapter 4, and upon the soundest engineering techniques and statistical approaches.

CHAPTER 3

SUMMARY

This study comprises (a) an updating of prior NPC estimates of productive capacities to January 1, 1965, and (b) annual projections of productive capacities to January 1, 1970.

A. Productive Capacities on January 1, 1965

The productive capacities of crude oil, natural gas and natural gas liquids in the Untied States on January 1, 1965, were estimated to be:

Crude Oil:	12,107 thousand barrels daily
Natural Gas:	106,078 million cubic feet daily
Natural Gas Liquids:	3,300 thousand barrels daily

Detailed estimates of January 1, 1965 productive capacities by PAD Districts are presented in Table 1 and comparisons with prior estimates by the National Petroleum Council are presented in Tables 2, 3 and 4.

The present study indicates an increase in crude oil productive capacity since January 1, 1964 of 517,000 barrels per day, substantially all of which occurred in PAD District 3. (See Appendix 1 for map of PAD Districts.)

The current study also indicates an increase in gas and natural gas liquids productive capacities since January 1, 1964 of 8,494 million cubic feet per day and 497,400 barrels per day respectively. The major portion of this increase occurred in PAD District 3 with a slight increase recorded in PAD District 2.

These capacities do not represent immediate or actual production but potential production subject to the limitations set forth in the Introduction and Definitions.

B. Projections of Productive Capacities - 1966 to 1970

Projections of productive capacities by PAD Districts are shown in Tables 5, 6 and 7. Total United States projections through January 1, 1970 are:

DATE	CRUDE OIL (Thous. Bbls. Daily)	NATURAL GAS (Million Cu. Ft. Daily)	NATURAL GAS LIQUIDS (Thous. Bbls. Daily)
1/1/66	12,232	108,492	3,344
1/1/67	12,367	110,148	3,378
1/1/68	12,516	110,957	3,376
1/1/69	12,566	111,410	3,366
1/1/70	12,613	111,999	3,356

No attempt was made in this study to estimate decline in capacity over the projection period should drilling and other measures to increase capacity cease. The maintenance of U. S. productive capacity is directly dependent upon the continuation of an adequate exploration and development program. In the absence of this activity the total U. S. capacity would decline immediately.

CHAPTER 4

BASIC ASSUMPTIONS USED IN MAKING PROJECTIONS

Since the projections of productive capacities into the future are based upon a continuing program of exploration and development, and as federal and state governmental policy and economic conditions would have great influence on industry programs in the future, it was necessary to establish guideline assumptions covering these factors. The "ground rules" for this study were developed by the Department of the Interior and furnished to the Committee. These assumptions are:

(1) Price relationships of competitive fuels will not change significantly during the period;

(2) Federal import policy will continue to have a comparable impact to that of the present;

(3) Federal and state conservation policies will not be changed significantly during the projection periods;

(4) Taxes will not change appreciably;

(5) Nuclear energy and oil shale will have no significant effect on markets;

(6) Peacetime conditions to continue with absence of major national emergency or stoppage in availability of foreign produced oil; and

(7) Conditions during assumed major national emergency were not considered, except in such broad terms as the Committee found helpful in generalizing on possible alternatives.

CHAPTER 5

METHODOLOGY

A. General Considerations

The membership of the two subcommittees organized by the Committee on Future Petroleum and Gas Producing Capabilities was drawn from the oil and gas industry and from the Office of Oil and Gas of the U. S. Department of the Interior. Those serving have long experience in the study of oil, gas and natural gas liquids reserves, producing capacities of oil and gas wells and reservoirs, and the operation of gas processing plants. Many of these men have served on previous NPC productive capacity committees, as well as other committees that have dealt with similar studies, and currently many serve either on the API Committee on Crude Oil Reserves or the AGA Committee for Natural Gas and Natural Gas Liquids Reserves. The contents of this report represent the cumulative experience of hundreds of experts in the industry.

For the purpose of estimating crude oil, natural gas, and natural gas liquids productive capacities, the U. S. was divided into areas with the boundaries determined partly by natural geologic divisions of the country, partly by state lines, and in the case of Texas, by Railroad Commission Districts. Within each of these areas the knowledge of engineers and geologists familiar with the producing characteristics of the fields was utilized.

The Committee had two tasks, (a) an updating of productive capacity estimates previously reported by the NPC, the methodology for which would primarily be based on historical data or experience, and (b) the projection of productive capacity estimates into the future, necessitating the use of a methodology adapted to a situation where no historical data points or experience are available.

B. Methods of Updating Estimated U. S. Productive Capacities to January 1, 1965

The updating of capacities of crude oil, natural gas, and natural gas liquids was done in accordance with the definitions

in Chapter 2 of this report, and only those fields and wells producing or capable of producing on January 1, 1965, were considered. No allowance was made for fields to be discovered or wells that might be drilled in the future. Additionally, the workover of wells or the initiation in the future of improved recovery techniques or improvement of plant efficiencies were not taken into account.

The methods used in determining productive capacities as of January 1, 1965, are compatible with those used in previous U. S. productive capacity reports made by the NPC.

C. Methods for Projecting Estimated U. S. Productive Capacities (January 1, 1966 to January 1, 1970)

In making the projections of productive capacities of crude oil, natural gas and natural gas liquids, the Coordinating Subcommittees took into account, in addition to the basic assumptions furnished by the Department of the Interior and set forth in Chapter 4, such significant factors as:

(1) The geologic potential of the various areas of the U. S. and the assumption of an adequate exploration program;

(2) The number of wells to be drilled 4/ and the capacities to be added by these wells in new fields to be found as well as in existing fields;

(3) The effect on productive capacities of workovers to be done and improved recovery projects to be initiated during the forecast period, including the effect of new recovery methods;

(4) The production of the U. S. and the effect that the attendant depletion of reserves would have on capacities in both present fields and in the new fields to be added during the period; and

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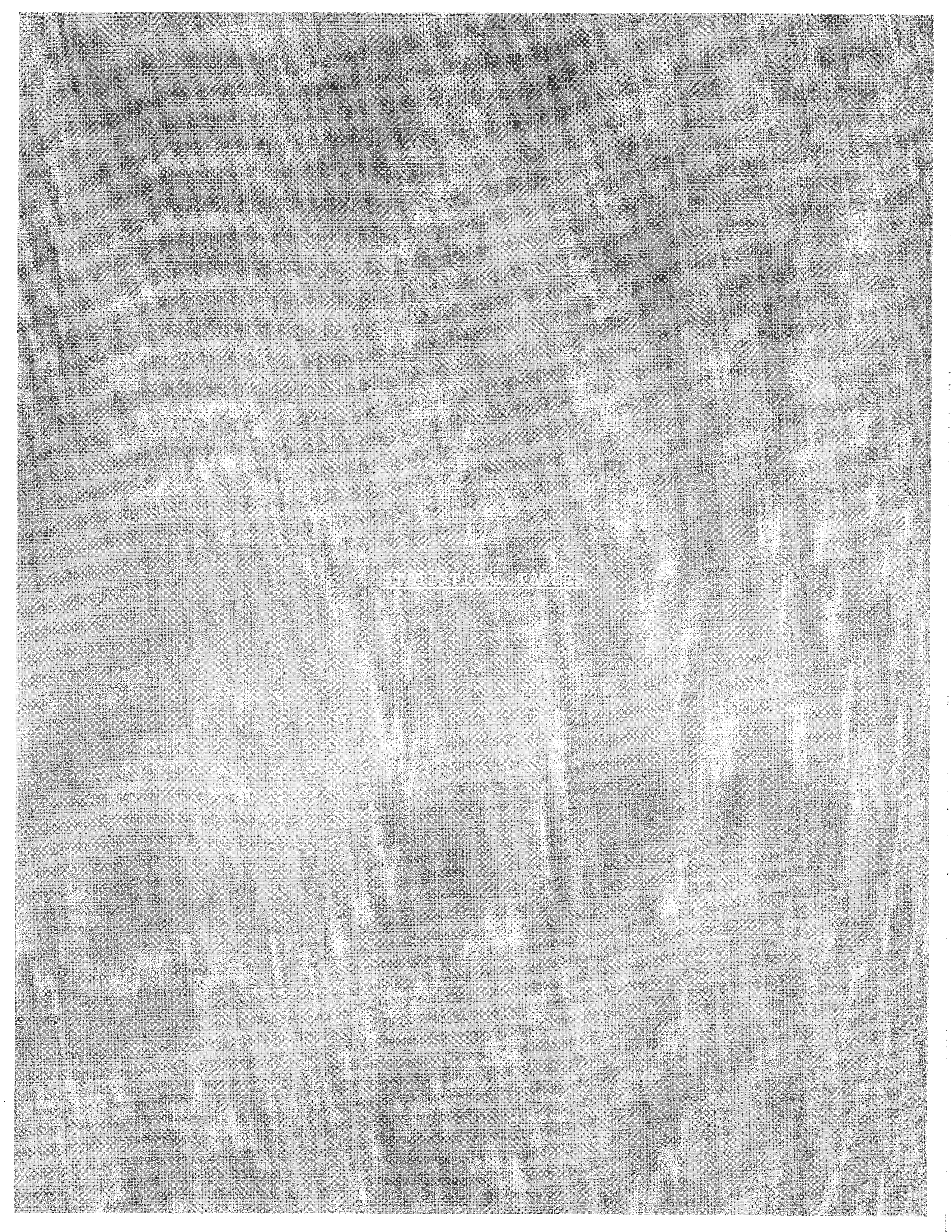
4/ See Footnote 3/ supra, p. 7.

(5) The continuation of the current recovery efficiencies of natural gas processing plants.

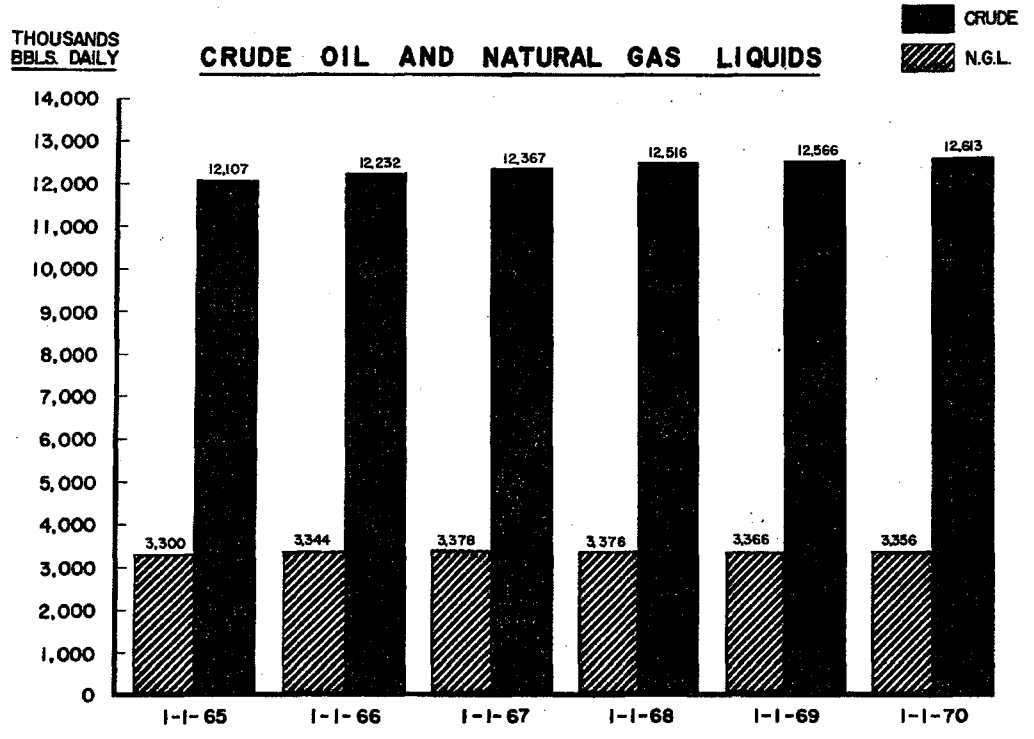
The production rates of oil, natural gas, and natural gas liquids contained in the report entitled AN APPRAISAL OF THE PETROLEUM INDUSTRY IN THE UNITED STATES, published by the U. S. Department of the Interior in January, 1965, were used as guidelines in this study.

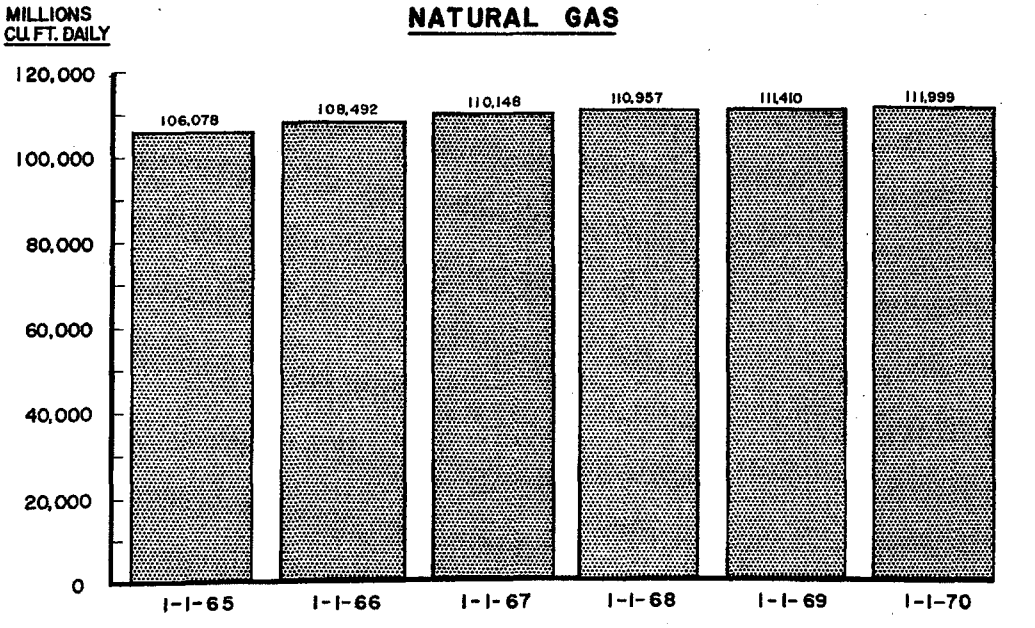
As discussed in Chapter 2, the projections of productive capacities are necessarily based on a continuing program of exploration and development. Should the actual program of industry differ substantially, the productive capacities of the U. S. will be different than the estimates shown.


STATISTICAL TABLES

U.S. PRODUCTIVE CAPACITIES

JANUARY 1, 1965 TO JANUARY 1, 1970





NOTE: The above Chart is based upon and can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 1

CRUDE OIL, NATURAL GAS AND NGL
ESTIMATED PRODUCTIVE CAPACITIES
IN THE UNITED STATES ON JANUARY 1, 1965

PAD DISTRICT[1/]	CRUDE OIL (Thousand Barrels Daily)	NATURAL GAS (Million Cubic Feet Daily)	NATURAL GAS LIQUIDS (Thousand Barrels Daily)
1 - East Coast	30	869	22
2 - Mid-Continent	1,424	15,750	261
3 - Gulf Coast	8,936	84,851	2,887
4 - Rocky Mountain	690	2,237	50
5 - West Coast*/	1,027	2,371	80
Total United States	12,107	106,078	3,300

*/ Including Elk Hills.

1/ See Appendix 1 for map of PAD Districts.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 2

CHANGES IN ESTIMATED PRODUCTIVE CAPACITY
OF CRUDE OIL IN THE UNITED STATES 1951-1965
(Thousand Barrels Daily)

PAD DISTRICT[1/]	JAN. 1 1951	JAN. 1 1953	JULY 1 1954	JAN. 1 1957	JAN. 1 1960	JAN. 1 1964	JAN. 1 1965
1 - East Coast	54	49	43	37	29	30	30
2 - Mid-Continent	1,083	1,238	1,380	1,591	1,555	1,473	1,424
3 - Gulf Coast	4,161	4,686	5,224	6,613	7,331	8,399	8,936
4 - Rocky Mountain	350	394	561	615	664	678	690
5 - West Coast[*/]	1,079	1,098	1,123	1,011	1,006	1,010	1,027
Total United States	6,727	7,465	8,331	9,867	10,585	11,590	12,107

*/ Including Elk Hills. The estimates for January 1, 1960, 1964 and 1965, included Elk Hills at a total of 175,000 barrels daily. See prior reports for previous estimates for Elk Hills.

1/ See Appendix 1 for map of PAD Districts.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 3

CHANGES IN ESTIMATED PRODUCTIVE CAPACITY OF NATURAL GAS IN THE UNITED STATES 1960-1965
(Million Cubic Feet Daily @ 14.65 psia and 60°F)

PAD DISTRICT[1]	ASSOCIATED as of January 1,			NON-ASSOCIATED as of January 1,			DISSOLVED as of January 1,			TOTALS as of January 1,		
	1960	1964	1965	1960	1964	1965	1960	1964	1965	1960	1964	1965
1 - East Coast	0	0	0	983.2	919.0	839.6	7.1	11.2	29.8	990.3	930.2	869.4
2 - Mid-Continent	888.4	1,083.6	1,099.7	5,466.9	12,176.3	13,473.5	1,848.3	1,448.1	1,176.3	8,203.6	14,708.0	15,749.5
3 - Gulf Coast	4,267.8	5,532.0	7,220.8	41,892.6	58,828.3	65,755.5	11,960.8	12,963.7	11,874.9	58,121.2	77,324.0	84,851.2
4 - Rocky Mountain	151.0	140.4	149.4	1,720.0	1,789.0	1,730.2	456.0	299.5	357.1	2,327.0	2,228.9	2,236.7
5 - West Coast	0[2]	0[2]	0[2]	728.0	1,217.0	1,304.0	1,134.0	1,176.0	1,067.0	1,862.0	2,393.0	2,371.0
Total United States	5,307.2	6,756.0	8,469.9	50,790.7	74,929.6	83,102.8	15,406.2	15,898.5	14,505.1	71,504.1	97,584.1	106,077.8

1/ See Appendix 1 for map of PAD Districts.

2/ Included in dissolved.

NOTES:
1. This statement does not include any gas available from storage reservoirs.
2. This statement does include gas available from reservoirs being cycled.
3. In some cases, associated gas production cannot be distinguished from dissolved gas production. In these cases, all such gas is tabulated as dissolved.
4. The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 4

CHANGES IN ESTIMATED PRODUCTIVE CAPACITY OF NATURAL GAS LIQUIDS IN THE UNITED STATES 1960-1965
(Thousand Barrels Daily)

PAD DISTRICT[1]	ASSOCIATED as of January 1,			NON-ASSOCIATED as of January 1,			DISSOLVED as of January 1,			TOTALS as of January 1,		
	1960	1964	1965	1960	1964	1965	1960	1964	1965	1960	1964	1965
1 - East Coast	0	0	0	10.2	22.3	22.1	0	0	0	10.2	22.3	22.1
2 - Mid-Continent	13.3	23.1	27.0	70.2	92.4	177.8	79.1	53.7	56.0	162.6	169.2	260.8
3 - Gulf Coast	125.7	219.2	283.0	843.4	1,564.2	1,988.6	532.7	701.8	615.3	1,501.8	2,485.2	2,886.9
4 - Rocky Mountain	2.0	1.3	2.9	15.0	16.0	24.8	20.0	26.7	22.6	37.0	44.0	50.3
5 - West Coast	0[2]	0[2]	0[2]	0	3.0	4.0	88.0	79.0	76.0[3]	88.0	82.0	80.0
Total United States	141.0	243.6	312.9	938.8	1,697.9	2,217.3	719.8	861.2	769.9	1,799.6	2,802.7	3,300.1

1/ See Appendix 1 for map of PAD Districts.

2/ Included in dissolved.

3/ Including 8,000 barrels per day for Elk Hills.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 5

PROJECTED PRODUCTIVE CAPACITY
OF CRUDE OIL IN THE UNITED STATES 1966-1970
(Thousand Barrels Daily)

PAD DISTRICT[1/]	JAN. 1 1966	JAN. 1 1967	JAN. 1 1968	JAN. 1 1969	JAN. 1 1970
1 - East Coast	31	33	34	33	31
2 - Mid-Continent	1,382	1,338	1,305	1,261	1,211
3 - Gulf Coast	9,022	9,136	9,192	9,232	9,266
4 - Rocky Mountain	685	695	705	710	725
5 - West Coast*/	1,112	1,165	1,280	1,330	1,380
Total United States	12,232	12,367	12,516	12,566	12,613

*/ Including Elk Hills.

1/ See Appendix 1 for map of PAD Districts.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 6

PROJECTED PRODUCTIVE CAPACITY OF NATURAL GAS IN THE UNITED STATES 1966-1970
(Million Cubic Feet Daily @ 14.65 psia and 60°F)

PAD DISTRICT[1]	JAN. 1 1966	JAN. 1 1967	JAN. 1 1968	JAN. 1 1969	JAN. 1 1970
1 - East Coast					
Associated	0	0	0	0	0
Non-associated	829.1	826.0	823.0	820.2	817.2
Dissolved	31.6	33.4	34.4	34.3	34.3
Total	860.7	859.4	857.4	854.5	851.5
2 - Mid-Continent					
Associated	1,041.4	1,001.5	947.8	901.0	856.2
Non-associated	13,139.3	12,862.1	12,511.2	11,959.3	11,439.0
Dissolved	1,175.3	1,166.0	1,140.0	1,111.0	1,081.8
Total	15,356.0	15,029.6	14,599.0	13,971.3	13,377.0
3 - Gulf Coast					
Associated	7,109.7	7,032.3	6,888.4	6,760.7	6,711.1
Non-associated	68,756.0	70,822.0	72,226.1	73,564.8	74,983.4
Dissolved	11,751.9	11,716.1	11,623.1	11,505.2	11,337.2
Total	87,617.6	89,570.4	90,737.6	91,830.7	93,031.7
4 - Rocky Mountain					
Associated	143.6	138.6	134.0	129.8	126.1
Non-associated	1,664.2	1,594.7	1,523.7	1,461.8	1,394.6
Dissolved	346.0	344.2	341.5	337.6	336.5
Total	2,153.8	2,077.5	1,999.2	1,929.2	1,857.2
5 - West Coast					
Associated[2]	0	0	0	0	0
Non-associated	1,366.0	1,423.0	1,476.0	1,524.0	1,569.0
Dissolved	1,138.0	1,188.0	1,288.0	1,300.0	1,313.0
Total	2,504.0	2,611.0	2,764.0	2,824.0	2,882.0
Total United States					
Associated	8,294.7	8,172.4	7,970.2	7,791.5	7,693.4
Non-associated	85,754.6	87,527.8	88,560.0	89,330.1	90,203.2
Dissolved	14,442.8	14,447.7	14,427.0	14,288.1	14,102.8
Total	108,492.1	110,147.9	110,957.2	111,409.7	111,999.4

1/ See Appendix 1 for map of PAD Districts.

2/ Included in dissolved.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).

TABLE 7

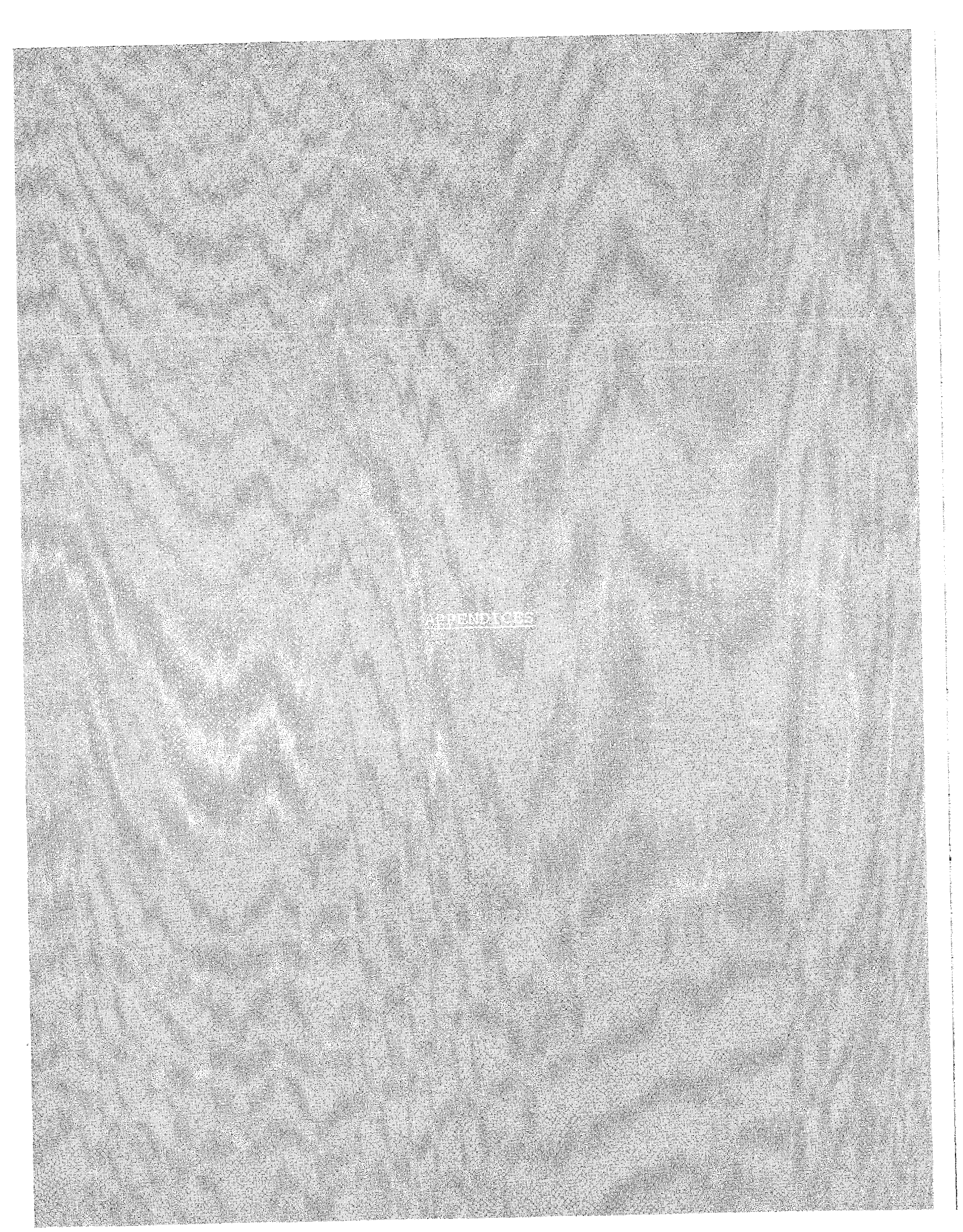
PROJECTED PRODUCTIVE CAPACITY OF NATURAL GAS LIQUIDS
IN THE UNITED STATES 1966-1970
(Thousand Barrels Daily)

PAD DISTRICT[1]	JAN. 1 1966	JAN. 1 1967	JAN. 1 1968	JAN. 1 1969	JAN. 1 1970
1 - East Coast					
Associated	0	0	0	0	0
Non-associated	21.9	21.9	21.9	21.8	21.8
Dissolved	0	0	0	0	0
Total	21.9	21.9	21.9	21.8	21.8
2 - Mid-Continent					
Associated	25.7	24.5	23.3	22.3	21.1
Non-associated	171.9	165.6	157.4	150.0	143.1
Dissolved	58.0	56.0	54.2	52.0	50.6
Total	255.6	246.1	234.9	224.3	214.8
3 - Gulf Coast					
Associated	277.2	272.7	263.5	254.4	250.6
Non-associated	2,058.8	2,114.4	2,138.8	2,160.3	2,179.9
Dissolved	596.7	587.2	576.6	565.5	549.3
Total	2,932.7	2,974.3	2,978.9	2,980.2	2,979.8
4 - Rocky Mountain					
Associated	2.7	2.6	2.5	2.4	2.3
Non-associated	23.6	22.5	21.4	20.4	19.3
Dissolved	21.8	21.7	21.4	21.1	21.0
Total	48.1	46.8	45.3	43.9	42.6
5 - West Coast					
Associated[2]	0	0	0	0	0
Non-associated	3.0	3.0	3.0	3.0	3.0
Dissolved	83.0	86.0	92.0	93.0	94.0
Total	86.0	89.0	95.0	96.0	97.0
Total United States					
Associated	305.6	299.8	289.3	279.1	274.0
Non-associated	2,279.2	2,327.4	2,342.5	2,355.5	2,367.1
Dissolved	759.5	750.9	744.2	731.6	714.9
Total	3,344.3	3,378.1	3,376.0	3,366.2	3,356.0

1/ See Appendix 1 for map of PAD Districts.

2/ Included in dissolved.

NOTE: The above Table can be used appropriately only in context with the entire report of the National Petroleum Council on "Estimated Productive Capacities" (July, 1966).



MAP OF PAD DISTRICTS

PAD—Petroleum Administration for Defense

APPENDIX 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20240

C
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Y

February 3, 1965

Dear Mr. Hamon:

With the growing emphasis on planning for the future on the part of Government and private industry, projections of probable future events are being made more frequently and with greater attention to trend analysis. One of the key series of data throughout the years, insofar as oil and gas are concerned, is that measuring the capacity to produce.

The Council, as you know, has studied proved discoveries and productive capacity of oil and gas at the request of this Department, and currently is engaged in the second of two similar studies. The current and the earlier study together will provide, we believe, a better basis for making projections of productive capacity than has been available in the past.

In view of the importance of knowing present and future capabilities to produce oil and gas in the United States, it is requested that the National Petroleum Council, using its studies as a basis, as well as other sources within the limits of Executive Order 11007 that it may consider helpful, make projections to 1970 of the capacity to produce crude oil, natural gas liquids, and natural gas: (a) under normal peacetime conditions; (b) under conditions of maximum production rates that might be required in major emergency.

To the extent that appropriate assumptions and clarification may be needed, the Office of Oil and Gas will be available for consultation.

Sincerely yours,

/S/ JOHN M. KELLY

Assistant Secretary of
the Interior

Mr. Jake L. Hamon
Chairman
National Petroleum Council
1625 K Street, N. W.
Washington, D. C. 20006

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1/ W. G. Maguire, Chairman, Panhandle Eastern Pipe Line Company, served as Vice Chairman (Natural Gas) on the Committee until his death on September 28, 1965.

2/ Deceased - May 9, 1966.

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