U.S. PETROLEUM IMPORTS 1969

A REPORT OF THE

NATIONAL PETROLEUM COUNCIL

TO THE

SECRETARY OF THE INTERIOR

1969

CHAPTER ONE

National Security

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NATIONAL SECURITY AND THE UNITED STATES PETROLEUM INDUSTRY

The sole justification for controls on oil imports into the United States is national security. This chapter deals briefly with the concept of national security and the critical position that petroleum occupies. The policies of the National Petroleum Council on the subject of national security have been stated in its 1966 report entitled *Petroleum Policies for the United States.* (see Appendix E). To make clear the basic considerations when the answers in the following chapters of this report were prepared, it is desirable to quote these policies and to elaborate on some of the reasons that support their validity.

National Security

> "A healthy and expanding domestic petroleum industry continues to be essential to the security of the United States and to the defense of the free world."

Imports

> "National security and assurance of adequate long-run supplies at reasonable cost for consumers require limiting total petroleum imports, including products, to a level which will provide opportunity for and encourage expansion of all phases of domestic petroleum operations in keeping with increasing demands insofar as practicable."

The soundness of these policies has never been more apparent than in today's troubled world. The Congress of the United States has on at least two occasions in the last decade recognized the interrelationship of national security and domestic production of requirements vital to that security. Thus, the Trade Agreements Extension Act of 1958, enacted in the year prior to the Mandatory Oil Import Program, provided that:

> "...the President shall, in the light of the requirements of national security and without excluding other relevant factors, give consideration to domestic production needed for projected national defense requirements."

Again, in the Trade Expansion Act of 1962, the Congress concerned itself with the protection of this Nation's security in its general approach to the removal of import restrictions, particularly regarding the maintenance of the capacity of domestic industries to meet projected national defense requirements.

Our Nation's principal commitment to other nations in the international trade area is the General Agreement on Tariffs and Trade, which in Article XXI contains a national security exception which provides:

> "Nothing in this Agreement shall be construed...(b) to prevent any contracting parties from taking any action which it considers necessary for the protection of its essential security interests...(iii) taken in time of war or other emergency in international relationships..." (61 Stat. [tt.5] A 63)

Concept of National Security

A nation's security is composed of a number of elements; the two most important elements are military security, and economic security. These elements are closely related, for military forces could hardly be maintained in the absence of a viable economy.

Petroleum and Military Security

It is difficult to conceive of a material that is more vital to military security than petroleum. The armed forces would be immobilized without it as a fuel for transportation. Petroleum is also utilized in some manner with the production, use, and maintenance of almost every item of material and equipment of those forces.

The dependence of the U.S. armed forces on petroleum has grown from the time this dependence began in 1912 to a direct requirement of more than 1 million barrels per day in fiscal year 1968. Since 1947, military petroleum requirements have increased more than threefold and this increase has been continuous, whether during periods of limited hostility such as the Korean and Vietnam conflicts, or during comparatively peaceful periods.

In today's world, characterized as it is by a variety of tensions and conflicts, the United States has no acceptable alternative to remaining militarily strong and this will probably require increasing supplies of petroleum.

Petroleum and the U.S. Economy

Energy is the very life blood of any economy and the U.S. economy is certainly no exception. As related to security, there are two basic problems: (1) security of supplies for the immediate requirements of the economy; and, (2) security of supplies for sustained future economic growth.

Today, petroleum--oil and gas--is the principal source of energy in the United States, providing some three-fourths of requirements. The civilian economy--this Nation's ability to produce goods and services for peacetime requirements and for defense--rests upon the availability of petroleum. Thus:

a) About 99 percent of the Nation's transportation runs on petroleum energy;

b) The average American farm now consumes about 2,750 gallons of petroleum fuel a year for all purposes;

c) Oil and gas together account for about 36 percent of the fuel used in electric power generation;

d) Some 90 percent of U.S. homes are heated by either oil or gas.

The ability of the United States to meet its domestic policy objectives and its international responsibilities and commitments to its free-world allies depends in large measure upon the continued long-range growth of its own economy. Energy and economic growth go hand in hand. Indeed, it would not be an overstatement to say that without adequate energy substantial economic growth cannot take place.

Petroleum and Free-World Security

A combination of circumstances has placed the United States at the very center of leadership in the free world alliance. With this position there go certain responsibilities which this Nation has always met completely. Among these is a recognition of the necessity to encourage the economic health and bolster the military posture of America's allies and free-world partners. Of course, assistance to them in providing for their energy supply in times of crisis or emergency is an aspect of our concern.

Petroleum Supply Security Considerations

Experience forcibly demonstrates that interference with overseas petroleum supplies can result from:

1. Military destruction of facilities, including tankers which are especially vulnerable during hostilities;

2. Shutdown or sabotage of facilities for political reasons;

3. Closing of production or transportation facilities for purposes of political or economic coercion;

4. Embargoes on exports as a means of political coercion.

Interruption of petroleum supply can result not only from the military, political or economic action of enemies of the United States, but also from conflicts among nations in which the United States is not involved such as in the 1967 Middle East conflict. Then, the Arab oil-producing states embargoed petroleum exports to the United States, the United Kingdom, and the Federal Republic of Germany, none of which was involved in the conflict. The effects of this embargo were overcome principally because the United States was self-sufficient in crude oil and was even able, because of its spare productive capacity, to export crude oil to Western Europe. These exports, together with crude diverted from non-American sources in the Western Hemisphere and elsewhere, were used in supplying the United Kingdom and Germany.

The deterrent effect of a strong domestic petroleum industry in the United States has been a major factor in overcoming any supply disruptions and suppressing potential disruptions. The fact that the U.S. domestic petroleum industry can sustain the U.S. economy in the face of supply disruption, and also can assist in the supply of this Nation's allies, is of the utmost importance in maintaining normal movement and supply of free-world petroleum.

The possibility of concerted action by some of the members of the Organization of Petroleum Exporting Countries (OPEC) should not be overlooked. Within the OPEC countries lie some 85 percent of the free world's reserves outside North America. A majority of these reserves are in the Middle East, parts of which have not been typified by great political stability during the post-World War II years.

Under normal conditions, Western Europe draws much of its supplies of petroleum from that area. It does not follow this Nation should do likewise. To date, Western Europe has not proved to be in a position to satisfy its energy needs, particularly petroleum needs, from sources within its area.

Thus, petroleum imports are a necessity to that area. However, the governments and regional organizations in Western Europe are justifiably concerned with maintaining security of petroleum supply at reasonable costs. On the other hand, the United States, with its substantial oil reserves, is not reduced to accepting the option of dependence upon imports of petroleum and would be risking its economic preeminence and position of free-world leadership were it to do so.

The United States has risen to world leadership on the firm foundation of its national security--its military capability, economic strength, and freedom from foreign coercion. This position could not have been attained without an additional security--the security of a sufficient energy supply.

Assured domestic energy resources have been the basis of U.S. national security. This fact, therefore, should be the prime consideration in assessing the degree to which this Nation should rely on potentially unstable foreign sources of oil--the fuel which is the prime supplier of vital U.S. energy needs.

"Expansion of all phases of domestic petroleum operations" is the prerequisite for a healthy and secure domestic industry. It is axiomatic that a growing industry will automatically build in reserve producing capacity through its confidence in the future, while a static or declining industry, due to its doubts of the future, will rarely have reserve producing capacity.

The rationale for the oil import program should be to maintain a reasonable balance between foreign and domestic supplies, in light of increasing demands, which will help maintain an economic climate conducive to bringing forth the required additional supplies as dictated by national security. Government import policies should be sufficiently stable to give all phases of the industry the incentive for risking the tremendous capital requirements of a growing industry, and at the same time flexible enough to permit prompt adjustment to current conditions without loss of confidence in long-term objectives. Import programs should apply uniformly and equitably to all parties, and should be designed to interfere as little as possible with normal economic forces and with competitive relationships.

CHAPTER TWO

Question No. 7

Levels of Import Dependence

7. The following question should be answered under three alternative assumptions:

(1) That the present import control system is maintained indefinitely; or

(2) That overseas imports (other than residual fuel oil) have been doubled, and that the oil industry has adapted itself to the higher import level; or

(3) That overseas imports (other than residual fuel oil) have been quadrupled, and that the oil industry has had time to adapt itself to that import level.

How would your particular organization deal with the difficulties resulting from a sudden curtailment of overseas imports, and what means of adjustment could it find:

(a) If such imports were reduced (i) 50 percent or (ii) 100 percent; and

(b) If the curtailment were expected to last (i) for 6 months or (ii) several years and perhaps indefinitely?

How would you suggest that the Nation deal with such emergencies?

This question can be more realistically treated on a time basis by analyzing the problems raised by events as they might be expected to occur in the future. This method of treatment thus requires forecasts of future supply/demand situations. In answering this question, the Committee has utilized the forecasts presented by Mr. M. A. Wright to the Subcommittee on Antitrust and Monopoly of the Judiciary Committee of the United States. These forecasts are both current and are a part of the public record. In utilizing these forecasts, the Committee has neither endorsed them nor examined the supply and demand assumptions upon which they are based and recognizes that there are other forecasts of equal significance such as those of the Independent Petroleum Association of America. However, it is believed that the answers to this question would not be materially different had other forecasts been utilized. The attached Exhibits 1 and 2 are Mr. Wright's Exhibits II and IV. It should be mentioned that Exhibit 1 to this chapter presupposes a continued import program but not the precise present program in force.

The alternative assumptions (1), (2), and (3) can be made applicable to the following situations:

(1) Maintaining the Import Control Program

Based upon Mr. Wright's forecasts, as shown in Exhibit 1 maintenance of the Import Control Program would result in an increase of imports at a moderate rate from the present rate of about 14 percent of supply (excluding residual) to about 24 percent by 1985. Currently, the United States has standby producing capacity. A short duration cutoff of overseas imports in the near term would occasion supply dislocations and increased costs but probably would not present an unmanageable problem. For the longer term, assuming continuation of current trends in consumption, exploration results and reserve producing capacity, the problems occasioned by supply interruptions could prove extremely serious. If the additional productive capacity from the Alaskan north slope and the continental shelf areas should turn out to be very large, these trends would be changed, and might mitigate such difficulties.

Should the eventualities envisioned by various hypothetical situations actually occur, the U.S. Government could encourage a petroleum storage program as one means of attempting to guard against interruption of overseas imports. Such a measure would be found to provide at best a temporary alleviance to a serious supply interruption and would involve substantial costs.

Answers to (a) and (b) for the above model are as follows:
(a) (ii) - (b) (ii) (100 percent reduction for several years)

From 1975 to 1980, according to this forecast trend, imports would approximate 20 percent of demand. Since Canada might not be able to export such volumes to the United States, the loss of overseas imports would make it necessary to invoke some degree of rationing, which in the absence of major hostilities involving the United States, would be politically unacceptable to the American consumer. Rationing would be coupled with an acceleration of exploration and development for conventional petroleum and an acceleration of development of unconventional sources of petroleum supplies. These accelerated programs may be able to bring about elimination of rationing within a few years after their initiation. This would bring about a very tight supply and demand situation but it would not constitute a completely unmanageable dislocation.

From 1980 to 1985, imports would approximate about 23 percent of demand with overseas imports probably making up the larger percent of total imports. With this pattern of imports, an interruption would entail rationing of products to the consumer and accelerated programs of exploration for, and production of crude and synthetics. Here again, an extremely tight supply and demand situation would occur but an emergency approach without regard to costs should permit the nation to survive and to cope with the undescribed foreign event causing the supply disruption.

A standby storage program would appear to be of little value in the face of a discontinuation of imports which continues for several years.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

This is a less severe case that the previous one, but its effects should nevertheless be analyzed.

In an actual situation it would hardly be possible to know that the interruption would prove to be of short duration. Thus, rationing, with all of its public unacceptability, would no doubt be placed into immediate effect and accelerated emergency programs would be initiated. The prime effect of such an interruption would be to cause the United States to alter its energy policies in order to reduce dependence on imported crude even if higher costs of more expensive crudes and/or synthetics had to be accepted. These additional costs could be small relative to the total costs of dealing with the cause of the supply disruption.

(a) (i) - (b) (i) (ii)

These two cases would not cause the serious problems that would result in previous cases and would probably not require rationing.

(2) Overseas imports other than residual have been doubled and the oil industry has adapted itself to the higher import level.

By 1980, there could well be a doubling of overseas imports with continuation of the present Import Control Program. Under that program the growth and extent of overseas imports would depend on the level of imports from Canada. The critical point is not whether overseas imports increase by 100 or 200 percent, but rather what percentage of total demand is supplied by such imports. If the 100 percent increase occurs at a time when there is a high degree of dependability of crude supply, the interruption could be handled in a similar manner to that described in (1).

A very different situation would prevail if import controls were to be terminated and the United States would thereby be forced to embark upon a program of partial liquidation of its domestic producing industry. With no import controls, Exhibit 2 shows that imports will increase rapidly after 1975. In that situation, the availability of Canadian crude might not be assured in the face of the less attractive incentives that would probably have developed. Consequently, an extremely large percentage of imports might be overseas imports. If 58 percent of our supply (excluding residual) were imported, it is quite likely that most of this would be from overseas sources. The 100 percent increase in imports is not a theoretical case, nor is 200 percent increase,

nor is 1,000 percent increase. These increases will occur if import restrictions are removed--the only question is when will they occur.

Answers to (a) and (b) for the above model follow:

These answers will deal with the case of no import controls on crude with Exhibit 2 portraying the time sequence.

(a) (ii) - (b) (ii) (100 percent reduction for several years)

Under these conditions, overseas imports would rapidly increase in the post-1975 period. For security reasons, the U.S. Government could determine the necessity of constructing a substantial volume of standby storage at great costs and for what would constitute temporary assistance, at least in the event of major supply disruption. Immediately upon the reduction of imports, severe rationing would be placed into effect and expensive crash programs would be started on exploration and development of conventional sources. This program would be severely handicapped by the lack of trained petroleum industry personnel, including geologists and other highly trained types of personnel who would have left the industry during this period of demise. There would be an average annual increase in the gap between domestic supply and demand of some 0.9 million barrels per day in conventional crude sources which would require an exploration and development effort comparable to the present effort just to offset decline.

It is extremely doubtful that the decline could be arrested in less than 5 years even with crash programs of developing conventional and unconventional energy sources. While standby storage and rationing could ease the disruption somewhat during the period, there would nevertheless be a period of scarcity and economic dislocation. The specific question regarding what a severely weakened petroleum industry would do under such circumstances is best answered by saying it would undoubtedly do everything it could do to relieve the situation, but realistically it would take many years to reestablish the energy supply of the nation. Here again, the larger question is what would the nation be in a position to do about the unstipulated outside situation causing the curtailment of supplies. If the United States were actually engaged in hostilities, with the petroleum industry disrupted and much of its personnel departed, the nation would find itself in a precarious situation.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

Even though the nation may, through vast standby storage, rationing and other emergency measures, cope with such a situation, it should be emphasized that in an actual case it would be impossible to know at the outset whether the situation would continue for only 6 months. Severe rationing and

the accelerated programs would be initiated. In the absence of major military hostilities involving the United States, as has been suggested above, rationing of petroleum products to the American consumer would probably entail political problems of substantial magnitude. It also seems probable that the nation would then change its policies and undertake those programs necessary to maintain a reasonable degree of self-sufficiency in energy supplies.

(a) (i) - (b) (ii) (50 percent reduction for several years)

There is danger in drawing conclusions from this case, inasmuch as it only contemplates a reduction of about 1 million barrels per day of overseas imports other than residual fuel oil (1 million BPD present imports times 2 equals 2 million BPD, less 50 percent reduction equals 1 million BPD). This import rate of 2 million barrels per day will continue to be sustained for a very short period of time because at that time our domestic gap between supply and demand will be growing 0.9 million barrels per day per year which would have to be made up by additional imports in addition to the stipulated amount. Loss of 1 million barrels per day of crude cannot be considered in isolation, inasmuch as the more severe problem would be that resulting from the growing gap between supply and demand. It is therefore felt, as a practical matter, that the analysis and means of overcoming the interruption will be essentially the same as discussed in the *(a) (ii) - (b) (ii)* case where there were no import controls.

(a) (i) - (b) (i) (50 percent reduction for 6 months)

For the reasons just given this case raises essentially the same problems as *(a) (ii) - (b) (i)*.

(3) That Overseas Imports Quadruple

This contemplates overseas imports of 4 million barrels per day which could be expected prior to 1980 if there were no import control program.

Answers to (a) and (b) for this model are as follows:

These answers will deal with the case of no import controls with Exhibit 2 portraying the time sequence.

(a) (ii) - (b) (ii) (100 percent reduction for several years)

This case raises problems similar to *2 (a) (ii) - (b) (ii)* except that if it were to occur the result would be a national catastrophe. At the time the interruption occurred, the nation would be forced to initiate a program of developing 4 million barrels per day of production through conventional methods or by a combination of conventional and synthetics. It would be starting this

assignment under a very severe handicap, inasmuch as the major portion of the exploration and development personnel would have, of necessity, gone into other activities and young men choosing a career would have been discouraged from entering the petroleum industry. A year after the event the task would be to provide 4 million barrels per day plus the 0.9 million barrels per day growth in gap. Two years after the event the task would be 5.8 million barrels per day. This capacity of production would require as a minimum (depleting reserves at 12 percent annual rates) the location and development of 12.2 billion barrels of reserves for 4 million barrels per day producing capacity to 17.6 billion barrels of reserves for 5.8 million barrels per day producing capacity.

Historically, there have been very few years that an active and healthy petroleum industry in the United States has been able to locate and develop over 3.5 billion barrels of reserves per year. It is clearly evident that it would be impossible to start up the domestic industry and return it to the required producing stance for many years. Crash programs for development of synthetics would be required. These programs would be exceedingly expensive, time-consuming and, if successful, would produce much higher cost materials than would have been the case with a sustained petroleum industry with continuity of operations.

As to the specific question regarding what the petroleum industry would do under these circumstances, there is but one answer. It would do everything possible to provide the required petroleum. This would not be good enough, however, to assure the Nation the secure energy position that it has always enjoyed and takes for granted. There would be a period of some years (if and until the expensive synthetics became available) when the United States would need to drastically curtail its petroleum consumption thus endangering the very fabric of the nation. Once more, the larger question is what would the nation be in a position to do about the foreign situation causing the interruption of supplies. If actually engaged in hostilities, the position of the United States could be untenable.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

Emergency measures might be made sufficient to cope with such a situation. Again it must be understood, however, that in an actual case it could not be known whether the supply interruption would continue for only 6 months. Therefore, the steps described in the preceding case would undoubtedly be started at the outset of the problem. The larger question here is what concessions might the United States be coerced into making for relieving its untenable situation. To deal with such a question would require suppositions regarding the unspecified event leading to the curtailment of supply.

(a) (i) - (b) (ii) (50 percent reduction for several years)

There is also danger in deriving conclusions from the answer to this question inasmuch as the arithmetic poses the question of replacing only 2 million barrels per day. In an actual situation of supply interruption, there will only be a short period of time when overseas imports are 2 million barrels per day. Inasmuch as at that time there will be a continuing growth gap of 0.9 million barrels per day per year, even this rate, coupled with the need to offset two years of widening of the gap, would present requirements of 3.8 million barrels per day producing capacity. The previous assumption of 12 percent annual depletion rates gives reserve finding and development requirements of 11.6 billion barrels. It can be seen that it would be several years before the nation could reestablish its own energy requirements, during which period severe rationing of petroleum products would have to be imposed upon the American public even though the nation might not be involved in major hostilities at the outset of the disruption. Realistically, this situation is not any different from *(a) (ii) - (b) (ii)* since, primarily, the question is of the time when the event occurs that determines the severity of the damage rather than the assumption regarding the amount of imports that will continue to enter the United States. The further along the Nation might be in the liquidation of its domestic petroleum industry, the more severe the problem.

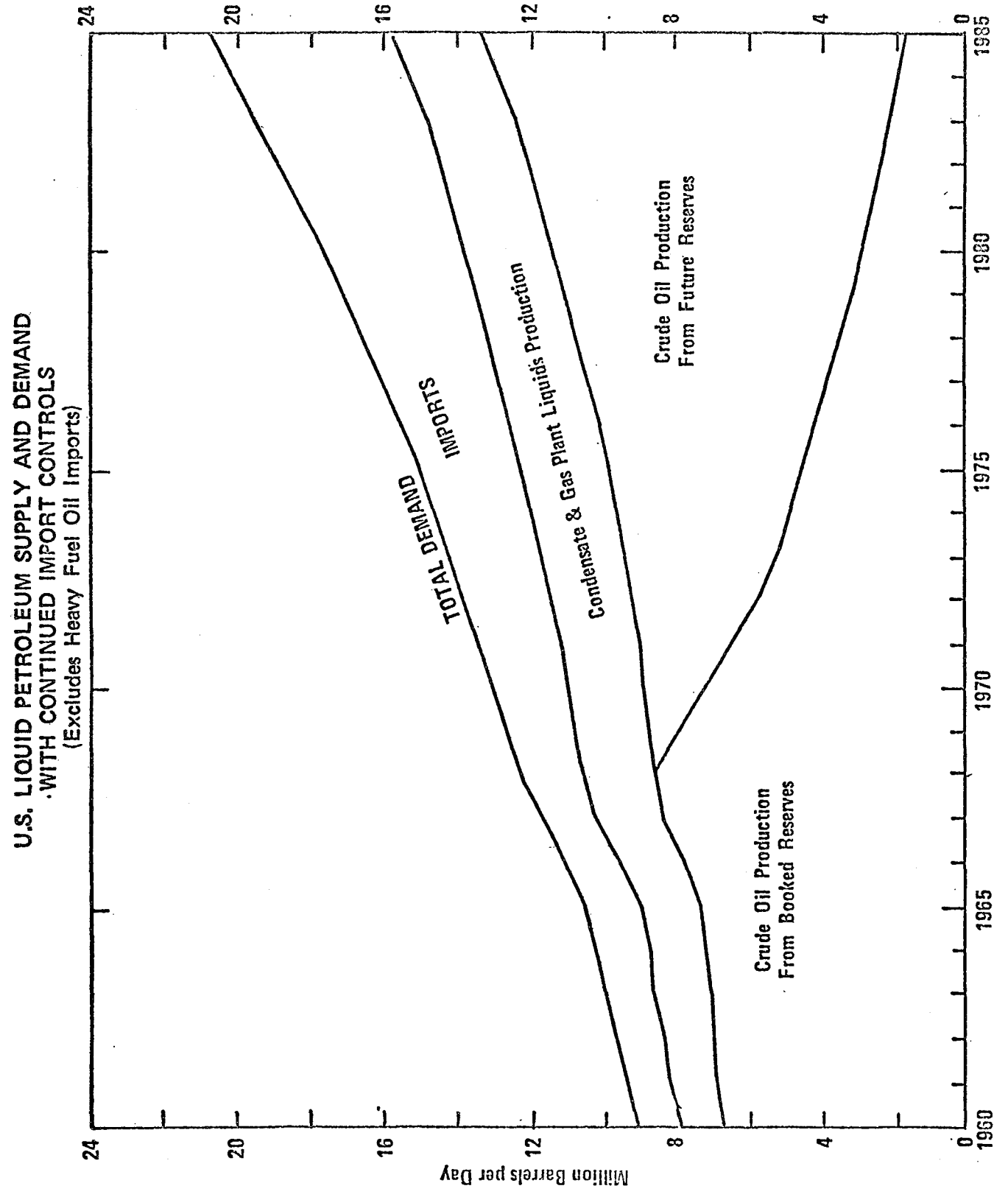
(a) (i) - (b) (i) (50 percent reduction for 6 months)

Here again, there is danger in deriving conclusions based on a simple answer to the question as stated, inasmuch as the arithmetic poses the question as being a reduction of 2 million barrels per day for 6 months. Just answering this simple question makes it seem that storage might deal adequately with the situation. However, the replies to *2 (a) (i) - (b) (i)* are highly applicable to this case.

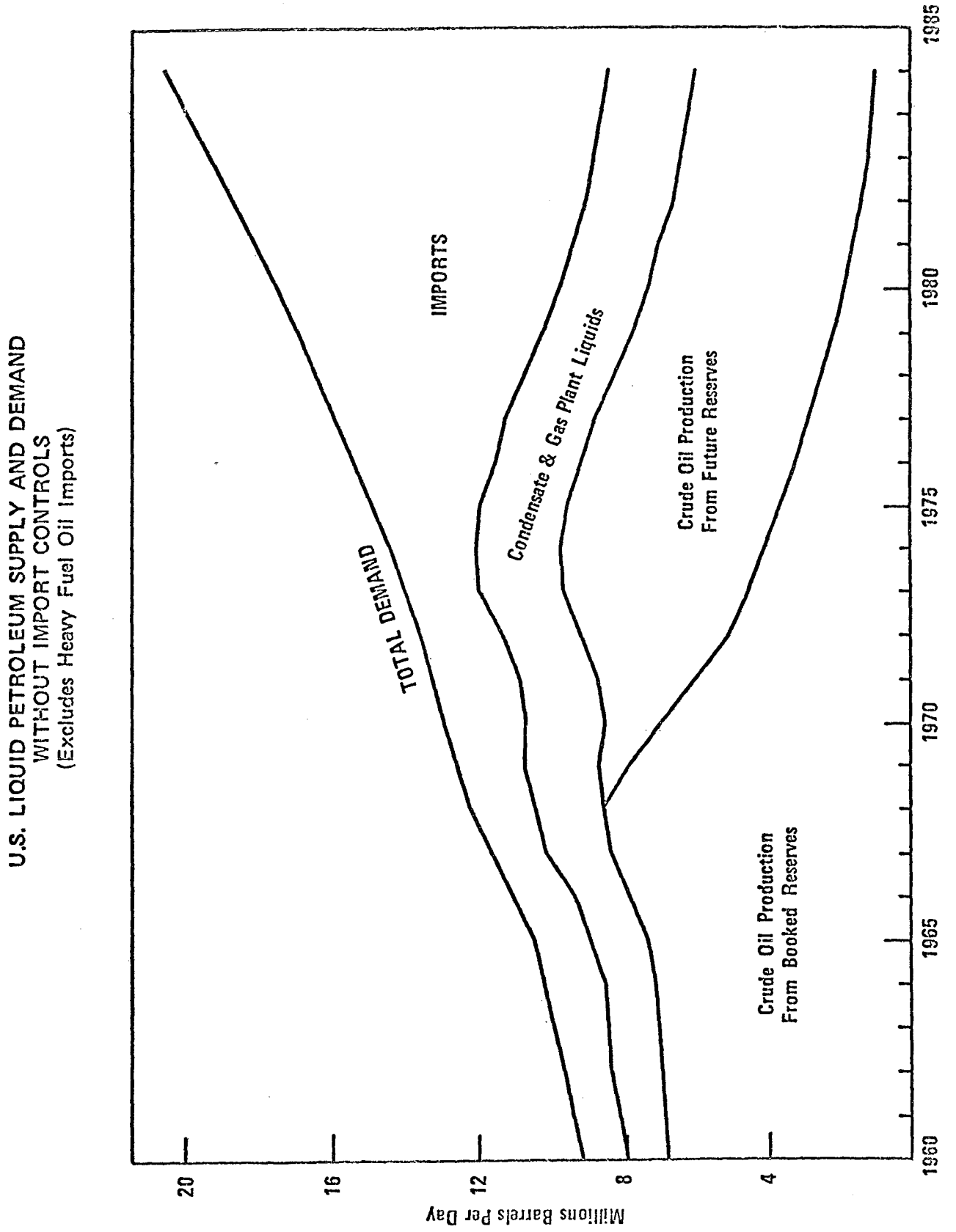
* * *

In responding to this question, no attempt has been made to estimate the costs of the various alternatives that are described in order to cope with various supply interruptions. Suffice it to say that implementation of such alternatives would result in higher costs to the U.S. economy. Experience in Western Europe during the 1956 and 1967 Middle East crises has proven that emergency supply arrangements, including mandatory storage requirements, result in substantially increased costs to the economies.

EXHIBIT 1.



Source: M. A. Wright's Exhibit II, presentation to Subcommittee on Antitrust and Monopoly of Judiciary Committee, U.S. Senate.



Source: M. A. Wright's Exhibit IV, presentation to Subcommittee on Antitrust and Monopoly of Judiciary Committee, U.S. Senate.

CHAPTER THREE

Question No. 8

Residual Fuel Oil Imports

8. If present import levels of residual fuel oils were suddenly discontinued completely for an indefinite period, how would your organization deal with the resulting difficulties, if any?

This question indicates a discontinuance of residual fuel oil imports, but apparently does not comtemplate a simultaneous discontinuance of imports of crude oil. This may be an unrealistic assumption. The question, nevertheless, is answered upon its own terms, namely, that residual imports are discontinued, but crude oil supplies remain adequate.

Total imports of residual type fuel oils in 1968 averaged about 1.1 million barrels per day, of which only 10,000 barrels per day entered the U.S. West Coast while the remainder entered New England, the Mid-Atlantic and Florida. Of these total imports, about 35 percent was consumed by electric utilities, about 55 percent by industry and space heating, and about 10 percent by ships bunkers and miscellaneous users. The small amount of residuals imported into the West Coast could be readily replaced on short notice with either domestic supplies or with natural gas since most users are also equipped to burn natural gas.

Temporary Discontinuance

On an average, there is about 65 million barrels of residual fuel oil in storage, in transit, or otherwise available on short notice. About 20 million barrels of this storage is located in District 1, where essentially all imported residual enters the United States. Another 10 million barrels in inventory, located in Districts 2 and 3, is either available at coastal refineries, marine terminals or can be moved on short notice by inland waterways to deepwater terminals for shipment to District 1. While existing inventories of residual would be drawn down rapidly, with resultant severe dislocations in certain localities, a sudden disruption of offshore supplies of residual fuel oils would not cause other significant difficulties during the initial 20 to 25 days.

Discontinuance for Indefinite Period

In the case of a disruption in offshore residual supplies for an indefinite period, about one month after the onset of the disruption, definite measures would be required on the part of the consumer, the refining industries and federal and state governments. Assuming that at the time of disruption the domestic crude and producing industry are in an active and

healthy posture, with spare capacity to deliver additional oil over an extended period of time, the U.S. petroleum industry could adjust its production and manufacturing phases. By so doing, adequate fuel oil could be provided to replace imported residuals within a reasonable time. Such an adjustment, however, in providing additional supplies of fuel oil would of course involve added costs. However, prudence would require the initiation of the following steps, none of which alone would be adequate to replace residual imports and which in sum may well leave some gap between demand and supply until production and manufacturing could be adjusted.

1. The electric generating industry should review its minimum requirements and determine available excess capacity in grids other than those which would be affected by the disruption of residual imports and transfer that excess to the latter grids.

2. The electric generating plants in District 1 should in the short run, in the few cases where feasible, substitute other fuels.

3. Heavy industry and space heating residual requirements in District 1 should in the short run, where feasible, substitute other fuels although the prospects for availability, deliverability and conversion are not great.

4. Existing spare crude oil producing capacity in the United States should be drawn upon to manufacture fuel oil in U.S. refineries. If necessary, some refineries could be operated to make more fuel oil and distillates and less gasoline by decreasing activity of processing equipment normally used to minimize fuel oil yields such as Delayed Cokers, Visbreakers and Catalytic Cracking Units. Many refineries will have increased crude running capacity when operated for higher fuel oil yield. This type of refinery running would obviously result in higher cost fuel oil and might require shortages in the supply of other products.

5. If residual fuel oils should become critically short for a temporary period of time, certain whole crudes could be substituted directly in power plants and heavy industry to replace residual oils. These whole crudes would require special handling for safety reasons because of their higher volatility, but otherwise would present no particular problems if burned on an intermittent or temporary basis.

These crudes can be made available at deep-water terminals on the Gulf Coast and on the West Coast for shipment to District 1.

6. Since this program would require the movement of substantial additional quantities of crude and fuel oils from the Gulf to East Coast terminals, the present fleet of U.S.-flag tankers would be inadequate to provide transport over a sustained period of time. However, this problem could be met if the Federal Government were to relax the restriction on the use of foreign-flag vessels in coastal trade for a period of time adequate to construct the necessary tankers, barges, and pipelines to cover this movement. There are adequate U.S.-owned tankers under foreign registry which could immediately move into U.S. coastal trade to cover this shortage.

* * *

Any future increases in demand for residual fuel oils will, in all probability, be supplied from overseas sources. Thus, if residual imports were discontinued for an indefinite period of time, at some date in the future when these imports perhaps had grown substantially during the intervening years, the disruption would probably cause much more serious dislocations to the electric power generating industry, to heavy industry and to space heating than in the present case. It would be prudent to review periodically the level of residual imports, the extent of dependency upon them and plans to cope with any supply interruption that might occur.

CHAPTER FOUR

Question No. 14

Effect of Imports on Exploration and Conservation

14. Do import restrictions conserve domestic reserves for possible emergency use? Do they encourage domestic exploration and thus discovery of significant new reserves sufficient to offset the additional depletion of domestic reserves caused by the substitution of domestic production for imports? Do they have effects on conservation and exploration in District V different from those in Districts I-IV?

The answer to this question should be considered in light of the basic need for import controls to protect our national security. The maintenance of a healthy and growing domestic oil industry assures an adequate long-run supply of domestic production and thus prevents dependence on foreign supply.

Do import restrictions conserve domestic reserves for possible emergency use?

Exploratory activity in recent years has been declining at an alarming rate. Import controls, nevertheless, served to encourage a degree of domestic exploratory and developmental activity which would not have occurred in the absence of such controls. Consequently, the total recoverable oil and gas known to exist in United States is now greater than it would have been without import controls. The oil industry cannot be viewed realistically as a static in institution subject to being frozen and preserved as of a particular moment of time, but rather as a growing, expanding vital force in our economy. Import controls have, by providing opportunity for growth to the domestic petroleum industry, contributed to the maintenance of our total domestic oil reserves.

The extent to which future supplies of petroleum from domestic reserves will be available for possible emergency situations is directly related to the growth of the domestic supply. It is apparent that one of the major factors which has had significant influence in the past and will continue to have influence in the future is the national oil import policy which establishes the level of petroleum imports.

Do they encourage domestic exploration and thus discovery of significant new reserves sufficient to offset the additional depletion of domestic reserves caused by the substitution of domestic production for imports?

Mandatory import regulations, adopted in 1959, were designed to provide a balance between imported crude oil and domestic supply that would result in the maintenance of a healthy domestic oil industry. They have provided a reasonable growing U.S. market for oil imports from other free-world sources as U.S. demand increased. This has also provided opportunity for the domestic industry to continue exploration for and development of new reserves.

There is substantial evidence to indicate that import controls have had a very important impact on the existing and future supply of domestic petroleum. These controls have contributed to the following:

a) During the past 10 years crude oil production in the United States has increased from 2.5 billion barrels in 1959 to 3.1 billion barrels in 1968 which represents a growth of approximately 27 percent. Even with this increasing rate of production, the oil industry has added sufficient reserves to maintain the total oil reserve level at approximately 31 billion barrels, despite increasing domestic production.

b) The industry has explored for and initiated the development of the potentially large reserves in Alaska. This area is recognized as having the potential to make a substantial contribution to the supply of domestic production in the future and may well prove to be one of the major discoveries of the worldwide oil industry.

c) The industry has expended the large capital funds necessary to acquire offshore leases on the Gulf Coast and in California. Exploration and production have now been initiated in these areas which are recognized as having the potential to contribute substantial additions to the domestic reserves.

Do they have effects on conservation and exploration in District V different from those in Districts I-IV?

Although there is a different method of determining import quotas for Districts I-IV as compared to District V, the differences do not have a significant effect on exploration efforts. The control of imports, under both methods of quota determina-

tion, continues to provide the domestic producer with a more attractive market opportunity for his production than would be the case without controls. This market opportunity for product is a vital factor in maintaining a healthy and viable domestic oil industry and is conducive to an active exploration program in the interest of national security.

Conservation as applied to petroleum is the planned wise management of this natural resource to provide reliable supplies of energy at reasonable costs and at the same time to prevent waste, to protect correlative rights, and to control pollution. Conservation is both necessary and desirable. Regulation by the various state agencies is the appropriate way to deal with diverse local conditions. In order to conserve resources and promote equity, the principal producing states have developed regulatory controls over drilling and production operations. These controls have helped to increase recovery of petroleum from reservoirs and to eliminate substantially unnecessary costs. This, in turn, has resulted in increased recoverable reserves from developed and known petroleum accumulations. Although the control and administration of import quotas is not directly related to conservation, this program does facilitate the tasks of state regulatory bodies in the area of conservation, thereby extending the economic life of wells and reservoirs and insuring maximum recovery of the oil in place. The above-described effect on conservation would not vary whether in District V or Districts I-IV.

CHAPTER FIVE

Questions No. 15, 16 and 17

Free-World Supply and Demand

CHAPTER FIVE

15. What is your estimate of the supplies of crude oil likely to become available in the world outside Communist China, the Soviet Union, and other members of the Warsaw Pact:
(a) Production of crude oil, by major supply areas, 1970, 1975, and 1980;
(b) Spare productive capacity, by major supply areas, 1970, 1975, and 1980;
(c) Proved reserves of crude oil, by major supply areas, 1970, 1975, and 1980?

(Production, and productive capacity and proved reserves in the United States should be included as a major supply area; assume that present import restrictions continue through 1980. Exports from the Soviet Union to the non-Communist world, if any, should be estimated and included as a separate item.)

16. What is your estimate of the final consumption demand for crude oil and equivalent products in the world outside the Communist bloc in 1970, 1975, and 1980? Estimate by major market areas:
(a) Western Europe;
(b) Japan;
(c) Other Asia and Africa;
(d) United States;
(e) Other North America;
(f) Australia--New Zealand;
(g) South America;

(NOTE: Use crude-oil equivalent barrels for product demands. As in question 15, assume that present import restrictions in the United States continue through 1980.)

The world petroleum environment continually changes as industry, governments, and people respond to new and changing developments, situations and pressures. In this environment long-term forecasts of oil supply and demand must, of necessity, be based on many critical assumptions, of which the U.S. import control restriction assumption is only one.

Consumption

The National Petroleum Council does not make forecasts of this type and the time limitation of this study would preclude a new demand study, but there are available some carefully considered published forecasts that may be combined to yield the desired numbers. The following estimated ranges of oil consumption in 1980 by major marketing areas (see Table 1) are based on such a compilation of published forecasts to 1980, including the Department of the Interior's *U.S. Petroleum Through 1980,* Canadian National Energy Board's *Preliminay Long Range Forecast,* O.E.C.D.'s *Energy Policy--Problems and Objectives* (covers Western Europe and Japan), and E.E.C.'s *Energy Series #1--World Energy Trends* (covers free world, including Latin America, Asia, Oceania, and Africa).

The figures as shown in Table 1 for the year 1968 and Column A under year 1980 were drawn from these just-mentioned sources. In total they reflect the low side of the estimated 1980 free-world consumption range. Column B under year 1980 is based on the higher forecast levels of several oil companies that included such projections in their recent submissions to the Cabinet Task Force questionnaire on Import Controls. These latter figures reflect the high side of the estimated 1980 free-world consumption range.

TABLE I

FREE WORLD OIL CONSUMPTION

Million Barrels Daily

Major Marketing Area	Oil Consumption			Percent of Total Free World			Average Annual Percent Change 1980/68	
		1980			1980			
	1968	A	B	1968	A	B	A	B
United States	13.4	18.2	18.7	41.1	33.3	28.9	3.0	3.3
Other North America	1.4	2.0	2.5	4.3	3.7	3.9	3.6	6.5
Latin America	2.3	5.0	5.4	7.1	9.1	8.4	9.8	11.2
Sub-Total Western Hemisphere	17.1	25.2	26.6	52.5	46.1	41.2	4.0	4.6
Western Europe	9.9	16.2	22.3	30.4	29.6	34.5	5.3	10.4
Japan	2.7	7.0	8.5	8.3	12.8	13.1	13.3	17.9
Other Asia & Africa	2.4	5.3	6.2	7.3	9.7	9.6	10.1	13.2
Oceania	.5	1.0	1.0	1.5	1.8	1.6	8.3	8.3
Sub-Total Eastern Hemisphere	15.5	29.5	38.0	47.5	53.9	58.8	7.5	12.1
Total Free World*	32.6	54.7	64.6	100.0	100.0	100.0	5.7	8.2
Free World (Excl. U.S.)	19.2	36.5	45.9	-	-	-	7.5	11.6

* Excludes U.S. Military Overseas - .5 MB/D in 1968.

These forecasts indicate:

1. Oil consumption in the United States should increase at an average annual growth rate of about 3 percent, or from about 13 million barrels per day in 1968 to between 18-19 million barrels per day by 1980. Oil accounted for about 45 percent of all energy consumed in the United States in 1968. By 1980, that share will probably decline moderately to around 40 percent. Oil's growth should not keep pace with that of total energy because of its small (7½ percent) share of the electric generation market, the fastest growing energy sector. In addition, oil should experience continued strong competition from natural gas and electricity in the residential, commercial and industrial markets. Oil should not be hurt by the advent of nuclear power as only 4 percent of all oil is consumed for power generation.

2. Major use of oil in the United States will most likely continue to be in transportation, which today accounts for 57 percent of oil demand, and which should increase to around 62 percent by 1980. About 42 percent of oil's total growth to 1980 should be in motor gasoline, 22 percent in jet fuel, and around 10 percent in other transportation fuels--mostly diesel. The major part of the balance (26 percent) will most likely be used in petrochemicals (12 percent) and the remainder distributed about equally between heating and industrial fuels and nonfuel products such as asphalt, lubes and coke.

3. Oil consumption in the free foreign countries should almost double or more by 1980, jumping from 19 million barrels per day in 1968 to between 36-46 million barrels per day by 1980. This range amounts to an average annual growth of between 7½ percent to over 11 percent, and will probably cause oil's share of the free foreign energy market to increase from 58 percent in 1968 to around 65 percent by 1980. Western Europe could account for almost 50 percent of the free foreign oil consumption increases between 1968 and 1980, Japan for over 20 percent, Latin America for about 10 percent, and Canada almost 5 percent.

Supply

The NPC has, in the past, forecasted the future U.S. productive capacities,[1] but time limitations preclude a new study to answer Question 15. The NPC report entitled *Impact of New Technology on the U.S. Petroleum Industry, 1946-1965* has some bearing on the answer to this question as it pertains to the United States. This report points out that with adequate incentives, U.S. crude oil production could meet the increased U.S. requirements of the decade of the 1970's. The trends of recent years in wells drilled, proved reserve additions, and productive capacity indicate that the present incentives to producers probably are not adequate to assure that U.S. crude productions will be capable of supplying U.S. requirements through 1980. The testimony of Mr. M. A. Wright before the Senate Subcommittee on Antitrust and Monopoly (see answer to Question 7) bears this out.

Unless present trends can be reversed upward by major new oil discoveries in the Arctic or elsewhere in the United States, the Nation will ultimately be forced toward increased dependence on either foreign crude or fuel from unconventional sources, or both. If it adopts petroleum policies which make further exploration in the United States substantially less attractive, the U.S. Government would be opting for increased reliance on foreign crude supplies. This course of action would involve the assumption of considerable, albeit unnecessary, risks and exposure to a potentially dangerous position vis-a-vis the U.S.S.R. Only Russia and the United States among the world's major powers have the choice of self-sufficiency in oil and energy. The U.S.S.R. has already made its choice.

Crude oil reserve and production data reported in the December 30, 1968, *Oil and Gas Journal* (pp. 102-103), shows that free world crude oil reserves *overall* are so great that even with only minimal reserve additions over the next 10 years, crude should be abundantly available to meet 1980 free-world demands, barring some major political upset (see Exhibit 1). According to this *Oil and Gas Journal* report, some 60 free foreign countries had some crude oil reserves and production in 1968. Most of these countries, however, produce relatively small amounts. At the present time, these large foreign supplies of crude oil are concentrated in relatively few countries.

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[1] See NPC report of July 19, 1966, *Estimated Productive Capacities of Crude Oil, Natural Gas and Natural Gas Liquids in the United States (1965-1970).*

Experience tells us that no highly accurate forecast of the distribution of supply--or of sources of supply to importing areas--can be made very much into the future, certainly not 10 years or 13 years. As illustrated in Exhibit 2, this decade has seen, for example, Libya's boom into prominence in world oil supply. We know of no forecast made 10 years ago or even 5 years ago which even closely approximated the phenomenal rise that has occurred.

The next decade presents equal uncertainties. Worldwide exploration continues strong, both in new areas and in areas strongly suspected or known to contain major oil reserves not yet proved. An outstanding example is the U.S. and Canadian Arctic area. The potential of this region is suspected to be enormous; but firm knowledge of proved and ultimate recoverable reserves and productive capacity is almost nonexistent, even for those companies involved in the initial development phase.

In view of the concentration of oil reserves and production in a small area of the world and among a small group of nations, it would be intolerable, in our view, for the United States to become increasingly dependent on foreign supply; or to permit domestic reserves and productive capacity to decline, by eliminating or reducing the incentives and the market assurance which stimulate domestic exploration and development of new production in areas such as the Arctic. Without import controls and the market assurance they provide, present incentives would not be adequate to promote the secure domestic oil supply, which is vital to this country's national security.

EXHIBIT 1.

Worldwide oil at a glance

COUNTRY	RESERVES		OIL PRODUCTION			REFINING		
	Oil (1,000 bbl)	Gas (billion cu ft)	Prod[illegible] Estimated 1968, 7-1,000 b/d	% Change from 1967	No. opr. refs.	Capacity (1,000 b/d), Jan. 1, 1969		
						Crude	Cracking	Reforming
ASIA-PACIFIC								
Afghanistan	*100,000	5,240	898.7	10.2	2	46.5	....	13.0
Australia	2,500,000	16,000	11.0	....	1	14.0	....	1.0
Brunei-Malaysia	600,000	650	†6.0	....	...	....	....	....
Burma	40,000	125	2.0	....	...	....	....	....
India	1,500,000	1,500	....	....	1	13.8	....	3.5
Indonesia	8,850,000	2,500	....	....	...	....	....	....
Japan	35,000	250	179.6	67.3	3	175.0	5.3	14.0
Korea, South	.....	....	....	....	1	11.0	....	2.0
New Zealand	26,000	*500	89.8	29.2	1	12.5	6.5	1.5
Pakistan	50,000	25,000	....	....	1	29.0	....	6.5
Philippines	.....	....	....	....	1	19.0	....	2.7
Taiwan	19,000	959	....	....	1	44.0	....	4.6
Thailand	200	....	....	....	1	10.0	....	2.0
Total Asia-Pacific	**13,720,200**	**52,724**	2,535.0	45.3	1	9.5	....	2.2
			....	....	1	12.0	....	2.0
			2.0	....	2	35.0	4.0	7.7
			....	....	1	20.0	....	2.7
			93.0	−70.8	1	40.0	....	4.6
			....	....	1	20.0	13.5	3.0
			....	....	1	12.6	....	1.7
			....	....	1	10.0	....	....
EUROPE			....	....	1	10.0	....	1.4
Austria	200,000	800	....	....	1	13.8	....	3.5
Belgium	.....	....	47.8	1.9	1	22.5	....	3.3
Denmark	.....	....	....	....	4	165.9	29.1	47.2
Finland	.....	....	**3,864.9**	**24.0**	**29**	**756.1**	**58.4**	**130.1**
France	185,000	8,500						
Greece	.....	....						
Ireland	.....	....						
Italy (incl. Sicily)	275,000	6,500						
Netherlands	300,000	82,176	342.8	16.7	14	445.8	222.3	10.0
Norway	.....	....	....	....	1	3.0	....	....
Portugal	.....	....	37.0	−7.0	4	14.0	....	....
Spain	14,000	....	160.3	9.2	11	462.4	86.9	38.7
Sweden	.....	....	....	....	1	11.0	....	1.8
Switzerland	.....	....	38.0	10.4	2	90.0	24.6	9.1
United Kingdom	8,000	30,000	179.8	−4.7	6	138.9	76.0	....
West Germany	720,000	10,200	....	....	1	8.0	3.0	1.2
Yugoslavia	235,000	3,000	0.5	....	3	93.0	24.0	15.6
Total Europe	**1,937,000**	**141,176**	7.0	12.9	3	37.0	6.0	....
			....	....	1	13.5	....	2.5
			....	....	2	20.5	....	5.9
			....	....	1	10.0	....	1.6
			....	....	1	28.0	....	3.0
			383.5	4.3	6	575.5	141.8	75.2
			....	....	2	795.0	504.0	37.0
			....	....	1	7.8	....	1.7
			....	....	1	70.0	30.0	8.5
MIDDLE EAST			....	....	1	5.0	....	....
Abu Dhabi	18,000,000	7,500	80.3	13.4	5	103.6	23.9	....
Aden	.....	....	....	....	2	155.0	70.5	13.5
Bahrain	170,000	100	187.1	5.0	3	417.0	38.5	32.0
Dubai	1,000,000	500	....	....	1	40.0	5.0	4.0
Iran	54,000,000	100,000	3,625.5	2.3	12	1,340.5	184.9	22.3
Iraq	28,000,000	20,000	....	....	1	100.0	....	6.0
Israel	15,000	75	9,153.2	3.8	269	11,658.0	5,779.7	3,656.8
Jordan	.....	....	1,023.0	6.2	42	1,305.7	532.2	507.3
Kuwait	69,000,000	39,100	**5,218.0**	**4.0**	**397**	**17,948.2**	**7,753.3**	**4,453.7**
Lebanon	.....	....	**1,768.8**	**9.7**	**707**	**38,804.9**	**9,620.3**	**7,100.6**
Muscat-Oman	2,500,000	1,500						
Neutral Zone	15,000,000	4,000						
Qatar	3,875,000	7,300						
Saudi Arabia	77,000,000	43,000	**6,684.1**	**6.7**	...	....	....	....
Syria	1,500,000	500	**8,452.9**	**9.2**	...	....	....	....
Turkey	700,000	200						
Total Middle East	**270,760,000**	**223,775**						

*Condensate. New Zealand to go on production in 1969.

[illegible]enced in Nov. 1968.

*Two gas-condensate wells discovered in 1968 not yet pro[illegible]

*Fateh field (3 oil wells) to begin production early in 1969.

[illegible]lbania 19,000; Czechoslovakia 12,000; Poland 20,000;
[illegible]n billion cu ft) U.S.S.R. 325,000; Red China 2,500; and

U.S. PETROLEUM IMPORTS

AUGUST 1, 1969

NATIONAL PETROLEUM COUNCIL

NATIONAL PETROLEUM COUNCIL

Jack H. Abernathy, *Chairman*
E. D. Brockett, *Vice-Chairman*
Vincent M. Brown, *Secretary-Treasurer*
Maxwell S. McKnight, *Asst. Secretary-Treasurer*

Petroleum Advisory Council
to the
U.S. DEPARTMENT OF THE INTERIOR

Walter J. Hickel, *Secretary*
Hollis M. Dole, *Asst. Secretary-Mineral Resources*
Gene P. Morrell, *Deputy Asst. Secretary-Mineral Resources*

and to the
OFFICE OF OIL AND GAS

Prepared by the
National Petroleum Council
in response to a request from the
Department of the Interior

ESTABLISHMENT AND PURPOSE OF THE NATIONAL PETROLEUM COUNCIL

In May, 1946, the President of the United States, by letter to the Secretary of the Interior, stated that he had been impressed with the great contribution of government-industry cooperation to the success of the World War II petroleum program, and that he felt the values of such close and harmonious relations between Government and the petroleum industry should be continued. Accordingly, the President suggested that the Secretary of the Interior establish an industry organization to consult with and advise the Secretary on oil and gas matters.

Pursuant to this direction, the National Petroleum Council was established by the Secretary of the Interior, Hon. J. A. Krug, on June 18, 1946.

The purpose of the National Petroleum Council is solely to advise, inform, and make recommendations to the Secretary of the Interior or the Director of the Office of Oil and Gas with respect to any matter relating to petroleum or the petroleum industry submitted to it by, or approved by, the Secretary or Director. The Council does reserve the right to decide whether it will or will not consider any matter referred to it. The Council does not concern itself with trade practices or the like, nor does it engage generally in any of the usual trade association activities.

Members of the National Petroleum Council are appointed each fiscal year by the Secretary of the Interior for one-year terms, the membership being drawn from all segments of the petroleum and natural gas industries, from the production phase to the retail marketing level. The Council is wholly supported by the voluntary contributions received from its members.

The Council is headed by a Chairman and Vice Chairman, both members of the Council and the Industry. The Secretary of the Interior serves as Co-Chairman of the National Petroleum Council, or the Assistant Secretary of the Interior for Mineral Resources so serves in the absence of the Secretary.

CONTENTS

INTRODUCTION

AND

SUMMARY

INTRODUCTION

Controls on U.S. petroleum imports have been imposed by the Federal Government on a voluntary basis since 1955, and under a mandatory program since 1959. The Oil Imports Administration of the Department of the Interior has administered the mandatory program since 1959, and the Department has kept it under constant analysis and review. However, no overall policy review of the program by the entire Government has been made since its inception.

In March, 1969, the President of the United States established a Cabinet Task Force on Oil Import Control, directing it to make a comprehensive review of the U.S. oil import control program. The review is to consider the Mandatory Oil Import Program, its present effects and the impact to be expected from possible changes in the program. The deliberations and forthcoming recommendations of the Task Force are clearly of great importance not only to the petroleum industry but to the economic welfare of this Nation. The Task Force has looked for advice and information not only from industry and interested citizens, but particularly from those agencies of the Federal Government having responsibilities and expertise in these matters.

Helping to conserve and stretch the mineral resources of this country--encouraging their wise and efficient use for the benefit of all our people--is one of the major missions of the Department of the Interior. In view of this and since the very objective of the mandatory oil import control program is to maintain a healthy domestic petroleum industry, the participation by the Secretary of the Interior and the Department in the Cabinet Task Force's effort is not only valuable, but necessary.

By letter of June 13, the Secretary of the Interior, the Hon. Walter J. Hickel, requested his petroleum industry advisory arm, the National Petroleum Council, to aid him in formulating his opinions and information input to the Task Force committee. The Council was invited to respond, by August 1, 1969, to any or all of the general and detailed questions published by the Task Force, but was asked to devote particular attention to 14 of the 82 detailed questions (i.e., Nos. 7, 8, 14, 15, 19, 20, 21, 22, 25(a), 42, 51, 52, 53, and 55). Appendix A presents the specific request, as well as all 82 questions published by the Task Force.

Secretary Hickel's request was considered by the NPC Agenda Committee in an emergency session held for that purpose on June 17 in Casper, Wyoming. The Agenda Committee recommended

to the Chairman of the Council that a special study committee be established in order to respond to the extent practicable to all the questions within the very limited time frame given. In addition, the Agenda Committee stated that in complying with this request for information, data and comments, the Committee undertaking the study should not suggest plans or programs.

In keeping with the provisions of Article 13 of the NPC By-Laws, and with the prior concurrence of the Department of the Interior, the Chairman of the Council established on June 24 the 28-member Committee on U.S. Petroleum Imports under the Chairmanship of Charles S. Mitchell, Chairman of the Board, Cities Service Company (see Appendix B). Hon. Hollis M. Dole, Assistant Secretary of the Interior for Mineral Resources, was designated Government Co-Chairman of this Committee.

It was necessary throughout this effort to proceed as rapidly as possible in order to respond to Secretary Hickel's request by August 1. To a large extent, the ability of the Committee to give more detailed answers and data was precluded by lack of time. On June 25 a Technical Subcommittee was established (see Appendix C). It was Chaired by Warren B. Davis, Director of Economics, Gulf Oil Corporation, and the Government Co-Chairman of the Subcommittee was John Ricca, Acting Director of the Office of Oil and Gas. At its first session held in New York City on July 2, the Main Committee agreed upon the following course of action:

1. All 14 questions would be answered to the fullest extent possible by August 1. Most of the questions involved could be answered either fully or at least in general manner and this would be done. However, it should be noted that since it is not within the province of the Council to engage in the projection of supply, demand, production, or prices, it was agreed that these estimates would not be provided when called for as part of any detailed question.

2. The Committee further agreed that all responses calling for data and statistics would have to be based on existing or available data since there was insufficient time to go out to the industry for new data, and then collect, tabulate and analyze it by August 1. The Committee did agree it would attempt to scan all of the published data relating to the questions it examined and make appropriate reference to any data considered generally acceptable in terms of industry experience.

3. It was further agreed that the Secretary of the Interior should be advised that there were certain of the questions or portions of them for which new data could be developed and analyzed, provided the Committee had a minimum of 6 months in which to do so, and with the assurance that the Secretary of the Interior could then use this information in the final deliberations of the Cabinet Task Force. If Interior should advise the Council that additional time was available for this purpose, then the Committee agreed it would proceed immediately to develop what data it could, on a sound basis, in connection with questions Nos. 19, 20 (for crude and product transportation costs and for crude refining costs) and 22.

4. Finally, the Committee agreed that there were certain questions or portions of them which were not feasible for the NPC to answer in detail or in the form requested in any time frame. These include wellhead costs per barrel for exploration, development and production as requested in question No. 20; all of question No. 21, because it is beyond the province of the National Petroleum Council to project production and prices; and the detailed data called for question No. 42 concerning Alaska.

The Technical Subcommittee broke itself down into seven task forces with each task force being responsible for certain of the questions (see Appendix D). A full meeting of the Technical Subcommittee was held in Washington on July 21 to receive the individual task force reports and a Subcommittee report was agreed upon and referred to the Main Committee for its final action in a meeting held on July 25.

The following report was adopted by the National Petroleum Council on July 31, 1969, and submitted to Secretary Hickel on August 1. The assignment was not only difficult, but the pressure of time was tremendous, as previously indicated.

SUMMARY

As early as 1949, and more recently in 1966, the National Petroleum Council strongly emphasized in its National Oil Policy statements, that:

a) the security of the United States requires a healthy and expanding domestic petroleum industry; and that,

b) the nation's economic welfare and security require a policy on petroleum imports limiting them to a level which will provide opportunities for and encourage expansion of all phases of domestic petroleum operations in keeping with increasing demands insofar as practicable.

The facts and circumstances that led to these statements have not changed during these intervening years; indeed the tensions in today's world are no less great than those of the earlier period. This report is based upon and is consistent in every respect with these previous statements on National Oil Policy. The major conclusions of the present study are as follows:

1. Oil import controls are justified because they are necessary to safeguard United States national security.

Since their initiation in 1959, subsequent Presidents of the Nation have successively concluded that oil import controls are necessary. National security has many facets, but the two most important ones are military security and economic security. Adequate domestic petroleum supplies are necessary for both military and economic security.

2. Import controls are essential to keep this Nation reasonably self-sufficient in petroleum.

A domestic industry capable of delivering substantial additional supplies of petroleum and products on short notice is a major asset to the United States and to those of our allies who are heavily dependent on oil imports.

U.S. Import controls, along with state conservation programs and U.S. income tax laws affecting petroleum are essential if U.S. producers are to have the continued economic incentives to keep this Nation reasonably self-sufficient in petroleum. Trends in exploration, drilling, and reserve additions in recent years make it questionable if U.S. producers now have adequate incentives to assure reliable long-term supply; it is very likely that relaxing or removing import controls will reduce those incentives and make it highly probable that our long-term domestic petroleum supplies will be inadequate for the growing U.S. requirements.

3. Import controls are essential to adequate future natural gas supplies.

The adequacy of long-term supplies of natural gas in the United States, under present policies, is questionable. Any action that discourages exploration for oil and gas in the United States will aggravate this problem.

4. Over-dependence by the United States on foreign oil supplies would invite very serious consequences.

The United States could elect to abandon its position of self-sufficiency, permit the demise of its domestic producing industry and move toward substantial dependence on offshore foreign imports. Such a policy might reduce refiners' crude costs temporarily. After this country had become highly dependent on offshore foreign crude, it would be possible for a group of producing countries, acting in concert, to deny the United States a major part of its oil supply. If this denial persisted for longer than a few months, it would paralyze the U.S. economy.

Although it is too early to be certain, the oil discoveries on the Alaskan north slope may indicate a major new oil province. If it is sufficiently large it will enable this Nation to maintain its self-reliance for at least another decade. This area would not have been explored, in all likelihood, or this discovery made in the absence of the import control program.

Producing costs for United States crude oil and landed costs for foreign crude oil are not readily measurable. It is doubtful if present foreign crude costs are a significant factor in measuring our national security need for import controls, because if the United States became highly dependent on imported crude, foreign crude costs could be expected to increase substantially.

5. Security of petroleum supplies would be attainable, at higher costs, through development of synthetic oils.

Synthetic oils from shale and coal do not appear to be competitive with conventional crude oil at the present time and if developed in the near future would probably result in higher cost fuel for the American economy. When they are needed, they can be developed at a somewhat higher cost than present conventional crude costs.

CHAPTER ONE

National Security

CHAPTER ONE

NATIONAL SECURITY AND THE UNITED STATES PETROLEUM INDUSTRY

The sole justification for controls on oil imports into the United States is national security. This chapter deals briefly with the concept of national security and the critical position that petroleum occupies. The policies of the National Petroleum Council on the subject of national security have been stated in its 1966 report entitled *Petroleum Policies for the United States.* (see Appendix E). To make clear the basic considerations when the answers in the following chapters of this report were prepared, it is desirable to quote these policies and to elaborate on some of the reasons that support their validity.

National Security

> "A healthy and expanding domestic petroleum industry continues to be essential to the security of the United States and to the defense of the free world."

Imports

> "National security and assurance of adequate long-run supplies at reasonable cost for consumers require limiting total petroleum imports, including products, to a level which will provide opportunity for and encourage expansion of all phases of domestic petroleum operations in keeping with increasing demands insofar as practicable."

The soundness of these policies has never been more apparent than in today's troubled world. The Congress of the United States has on at least two occasions in the last decade recognized the interrelationship of national security and domestic production of requirements vital to that security. Thus, the Trade Agreements Extension Act of 1958, enacted in the year prior to the Mandatory Oil Import Program, provided that:

> "...the President shall, in the light of the requirements of national security and without excluding other relevant factors, give consideration to domestic production needed for projected national defense requirements."

Again, in the Trade Expansion Act of 1962, the Congress concerned itself with the protection of this Nation's security in its general approach to the removal of import restrictions, particularly regarding the maintenance of the capacity of domestic industries to meet projected national defense requirements.

Our Nation's principal commitment to other nations in the international trade area is the General Agreement on Tariffs and Trade, which in Article XXI contains a national security exception which provides:

> "Nothing in this Agreement shall be construed...(b) to prevent any contracting parties from taking any action which it considers necessary for the protection of its essential security interests...(iii) taken in time of war or other emergency in international relationships..." (61 Stat. [tt.5] A 63)

Concept of National Security

A nation's security is composed of a number of elements; the two most important elements are military security, and economic security. These elements are closely related, for military forces could hardly be maintained in the absence of a viable economy.

Petroleum and Military Security

It is difficult to conceive of a material that is more vital to military security than petroleum. The armed forces would be immobilized without it as a fuel for transportation. Petroleum is also utilized in some manner with the production, use, and maintenance of almost every item of material and equipment of those forces.

The dependence of the U.S. armed forces on petroleum has grown from the time this dependence began in 1912 to a direct requirement of more than 1 million barrels per day in fiscal year 1968. Since 1947, military petroleum requirements have increased more than threefold and this increase has been continuous, whether during periods of limited hostility such as the Korean and Vietnam conflicts, or during comparatively peaceful periods.

In today's world, characterized as it is by a variety of tensions and conflicts, the United States has no acceptable alternative to remaining militarily strong and this will probably require increasing supplies of petroleum.

Petroleum and the U.S. Economy

Energy is the very life blood of any economy and the U.S. economy is certainly no exception. As related to security, there are two basic problems: (1) security of supplies for the immediate requirements of the economy; and, (2) security of supplies for sustained future economic growth.

Today, petroleum--oil and gas--is the principal source of energy in the United States, providing some three-fourths of requirements. The civilian economy--this Nation's ability to produce goods and services for peacetime requirements and for defense--rests upon the availability of petroleum. Thus:

a) About 99 percent of the Nation's transportation runs on petroleum energy;

b) The average American farm now consumes about 2,750 gallons of petroleum fuel a year for all purposes;

c) Oil and gas together account for about 36 percent of the fuel used in electric power generation;

d) Some 90 percent of U.S. homes are heated by either oil or gas.

The ability of the United States to meet its domestic policy objectives and its international responsibilities and commitments to its free-world allies depends in large measure upon the continued long-range growth of its own economy. Energy and economic growth go hand in hand. Indeed, it would not be an overstatement to say that without adequate energy substantial economic growth cannot take place.

Petroleum and Free-World Security

A combination of circumstances has placed the United States at the very center of leadership in the free world alliance. With this position there go certain responsibilities which this Nation has always met completely. Among these is a recognition of the necessity to encourage the economic health and bolster the military posture of America's allies and free-world partners. Of course, assistance to them in providing for their energy supply in times of crisis or emergency is an aspect of our concern.

Petroleum Supply Security Considerations

Experience forcibly demonstrates that interference with overseas petroleum supplies can result from:

1. Military destruction of facilities, including tankers which are especially vulnerable during hostilities;

2. Shutdown or sabotage of facilities for political reasons;

3. Closing of production or transportation facilities for purposes of political or economic coercion;

4. Embargoes on exports as a means of political coercion.

Interruption of petroleum supply can result not only from the military, political or economic action of enemies of the United States, but also from conflicts among nations in which the United States is not involved such as in the 1967 Middle East conflict. Then, the Arab oil-producing states embargoed petroleum exports to the United States, the United Kingdom, and the Federal Republic of Germany, none of which was involved in the conflict. The effects of this embargo were overcome principally because the United States was self-sufficient in crude oil and was even able, because of its spare productive capacity, to export crude oil to Western Europe. These exports, together with crude diverted from non-American sources in the Western Hemisphere and elsewhere, were used in supplying the United Kingdom and Germany.

The deterrent effect of a strong domestic petroleum industry in the United States has been a major factor in overcoming any supply disruptions and suppressing potential disruptions. The fact that the U.S. domestic petroleum industry can sustain the U.S. economy in the face of supply disruption, and also can assist in the supply of this Nation's allies, is of the utmost importance in maintaining normal movement and supply of free-world petroleum.

The possibility of concerted action by some of the members of the Organization of Petroleum Exporting Countries (OPEC) should not be overlooked. Within the OPEC countries lie some 85 percent of the free world's reserves outside North America. A majority of these reserves are in the Middle East, parts of which have not been typified by great political stability during the post-World War II years.

Under normal conditions, Western Europe draws much of its supplies of petroleum from that area. It does not follow this Nation should do likewise. To date, Western Europe has not proved to be in a position to satisfy its energy needs, particularly petroleum needs, from sources within its area.

Thus, petroleum imports are a necessity to that area. However, the governments and regional organizations in Western Europe are justifiably concerned with maintaining security of petroleum supply at reasonable costs. On the other hand, the United States, with its substantial oil reserves, is not reduced to accepting the option of dependence upon imports of petroleum and would be risking its economic preeminence and position of free-world leadership were it to do so.

The United States has risen to world leadership on the firm foundation of its national security--its military capability, economic strength, and freedom from foreign coercion. This position could not have been attained without an additional security--the security of a sufficient energy supply.

Assured domestic energy resources have been the basis of U.S. national security. This fact, therefore, should be the prime consideration in assessing the degree to which this Nation should rely on potentially unstable foreign sources of oil--the fuel which is the prime supplier of vital U.S. energy needs.

"Expansion of all phases of domestic petroleum operations" is the prerequisite for a healthy and secure domestic industry. It is axiomatic that a growing industry will automatically build in reserve producing capacity through its confidence in the future, while a static or declining industry, due to its doubts of the future, will rarely have reserve producing capacity.

The rationale for the oil import program should be to maintain a reasonable balance between foreign and domestic supplies, in light of increasing demands, which will help maintain an economic climate conducive to bringing forth the required additional supplies as dictated by national security. Government import policies should be sufficiently stable to give all phases of the industry the incentive for risking the tremendous capital requirements of a growing industry, and at the same time flexible enough to permit prompt adjustment to current conditions without loss of confidence in long-term objectives. Import programs should apply uniformly and equitably to all parties, and should be designed to interfere as little as possible with normal economic forces and with competitive relationships.

CHAPTER TWO

Question No. 7

Levels of Import Dependence

7. The following question should be answered under three alternative assumptions:

(1) That the present import control system is maintained indefinitely; or

(2) That overseas imports (other than residual fuel oil) have been doubled, and that the oil industry has adapted itself to the higher import level; or

(3) That overseas imports (other than residual fuel oil) have been quadrupled, and that the oil industry has had time to adapt itself to that import level.

How would your particular organization deal with the difficulties resulting from a sudden curtailment of overseas imports, and what means of adjustment could it find:

(a) If such imports were reduced (i) 50 percent or (ii) 100 percent; and

(b) If the curtailment were expected to last (i) for 6 months or (ii) several years and perhaps indefinitely?

How would you suggest that the Nation deal with such emergencies?

This question can be more realistically treated on a time basis by analyzing the problems raised by events as they might be expected to occur in the future. This method of treatment thus requires forecasts of future supply/demand situations. In answering this question, the Committee has utilized the forecasts presented by Mr. M. A. Wright to the Subcommittee on Antitrust and Monopoly of the Judiciary Committee of the United States. These forecasts are both current and are a part of the public record. In utilizing these forecasts, the Committee has neither endorsed them nor examined the supply and demand assumptions upon which they are based and recognizes that there are other forecasts of equal significance such as those of the Independent Petroleum Association of America. However, it is believed that the answers to this question would not be materially different had other forecasts been utilized. The attached Exhibits 1 and 2 are Mr. Wright's Exhibits II and IV. It should be mentioned that Exhibit 1 to this chapter presupposes a continued import program but not the precise present program in force.

The alternative assumptions (1), (2), and (3) can be made applicable to the following situations:

(1) Maintaining the Import Control Program

Based upon Mr. Wright's forecasts, as shown in Exhibit 1 maintenance of the Import Control Program would result in an increase of imports at a moderate rate from the present rate of about 14 percent of supply (excluding residual) to about 24 percent by 1985. Currently, the United States has standby producing capacity. A short duration cutoff of overseas imports in the near term would occasion supply dislocations and increased costs but probably would not present an unmanageable problem. For the longer term, assuming continuation of current trends in consumption, exploration results and reserve producing capacity, the problems occasioned by supply interruptions could prove extremely serious. If the additional productive capacity from the Alaskan north slope and the continental shelf areas should turn out to be very large, these trends would be changed, and might mitigate such difficulties.

Should the eventualities envisioned by various hypothetical situations actually occur, the U.S. Government could encourage a petroleum storage program as one means of attempting to guard against interruption of overseas imports. Such a measure would be found to provide at best a temporary alleviance to a serious supply interruption and would involve substantial costs.

Answers to (a) and (b) for the above model are as follows:
(a) (ii) - (b) (ii) (100 percent reduction for several years)

From 1975 to 1980, according to this forecast trend, imports would approximate 20 percent of demand. Since Canada might not be able to export such volumes to the United States, the loss of overseas imports would make it necessary to invoke some degree of rationing, which in the absence of major hostilities involving the United States, would be politically unacceptable to the American consumer. Rationing would be coupled with an acceleration of exploration and development for conventional petroleum and an acceleration of development of unconventional sources of petroleum supplies. These accelerated programs may be able to bring about elimination of rationing within a few years after their initiation. This would bring about a very tight supply and demand situation but it would not constitute a completely unmanageable dislocation.

From 1980 to 1985, imports would approximate about 23 percent of demand with overseas imports probably making up the larger percent of total imports. With this pattern of imports, an interruption would entail rationing of products to the consumer and accelerated programs of exploration for, and production of crude and synthetics. Here again, an extremely tight supply and demand situation would occur but an emergency approach without regard to costs should permit the nation to survive and to cope with the undescribed foreign event causing the supply disruption.

A standby storage program would appear to be of little value in the face of a discontinuation of imports which continues for several years.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

This is a less severe case that the previous one, but its effects should nevertheless be analyzed.

In an actual situation it would hardly be possible to know that the interruption would prove to be of short duration. Thus, rationing, with all of its public unacceptability, would no doubt be placed into immediate effect and accelerated emergency programs would be initiated. The prime effect of such an interruption would be to cause the United States to alter its energy policies in order to reduce dependence on imported crude even if higher costs of more expensive crudes and/or synthetics had to be accepted. These additional costs could be small relative to the total costs of dealing with the cause of the supply disruption.

(a) (i) - (b) (i) (ii)

These two cases would not cause the serious problems that would result in previous cases and would probably not require rationing.

(2) Overseas imports other than residual have been doubled and the oil industry has adapted itself to the higher import level.

By 1980, there could well be a doubling of overseas imports with continuation of the present Import Control Program. Under that program the growth and extent of overseas imports would depend on the level of imports from Canada. The critical point is not whether overseas imports increase by 100 or 200 percent, but rather what percentage of total demand is supplied by such imports. If the 100 percent increase occurs at a time when there is a high degree of dependability of crude supply, the interruption could be handled in a similar manner to that described in (1).

A very different situation would prevail if import controls were to be terminated and the United States would thereby be forced to embark upon a program of partial liquidation of its domestic producing industry. With no import controls, Exhibit 2 shows that imports will increase rapidly after 1975. In that situation, the availability of Canadian crude might not be assured in the face of the less attractive incentives that would probably have developed. Consequently, an extremely large percentage of imports might be overseas imports. If 58 percent of our supply (excluding residual) were imported, it is quite likely that most of this would be from overseas sources. The 100 percent increase in imports is not a theoretical case, nor is 200 percent increase,

nor is 1,000 percent increase. These increases will occur if import restrictions are removed--the only question is when will they occur.

Answers to (a) and (b) for the above model follow:

These answers will deal with the case of no import controls on crude with Exhibit 2 portraying the time sequence.

(a) (ii) - (b) (ii) (100 percent reduction for several years)

Under these conditions, overseas imports would rapidly increase in the post-1975 period. For security reasons, the U.S. Government could determine the necessity of constructing a substantial volume of standby storage at great costs and for what would constitute temporary assistance, at least in the event of major supply disruption. Immediately upon the reduction of imports, severe rationing would be placed into effect and expensive crash programs would be started on exploration and development of conventional sources. This program would be severely handicapped by the lack of trained petroleum industry personnel, including geologists and other highly trained types of personnel who would have left the industry during this period of demise. There would be an average annual increase in the gap between domestic supply and demand of some 0.9 million barrels per day in conventional crude sources which would require an exploration and development effort comparable to the present effort just to offset decline.

It is extremely doubtful that the decline could be arrested in less than 5 years even with crash programs of developing conventional and unconventional energy sources. While standby storage and rationing could ease the disruption somewhat during the period, there would nevertheless be a period of scarcity and economic dislocation. The specific question regarding what a severely weakened petroleum industry would do under such circumstances is best answered by saying it would undoubtedly do everything it could do to relieve the situation, but realistically it would take many years to reestablish the energy supply of the nation. Here again, the larger question is what would the nation be in a position to do about the unstipulated outside situation causing the curtailment of supplies. If the United States were actually engaged in hostilities, with the petroleum industry disrupted and much of its personnel departed, the nation would find itself in a precarious situation.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

Even though the nation may, through vast standby storage, rationing and other emergency measures, cope with such a situation, it should be emphasized that in an actual case it would be impossible to know at the outset whether the situation would continue for only 6 months. Severe rationing and

the accelerated programs would be initiated. In the absence of major military hostilities involving the United States, as has been suggested above, rationing of petroleum products to the American consumer would probably entail political problems of substantial magnitude. It also seems probable that the nation would then change its policies and undertake those programs necessary to maintain a reasonable degree of self-sufficiency in energy supplies.

(a) (i) - (b) (ii) (50 percent reduction for several years)

There is danger in drawing conclusions from this case, inasmuch as it only contemplates a reduction of about 1 million barrels per day of overseas imports other than residual fuel oil (1 million BPD present imports times 2 equals 2 million BPD, less 50 percent reduction equals 1 million BPD). This import rate of 2 million barrels per day will continue to be sustained for a very short period of time because at that time our domestic gap between supply and demand will be growing 0.9 million barrels per day per year which would have to be made up by additional imports in addition to the stipulated amount. Loss of 1 million barrels per day of crude cannot be considered in isolation, inasmuch as the more severe problem would be that resulting from the growing gap between supply and demand. It is therefore felt, as a practical matter, that the analysis and means of overcoming the interruption will be essentially the same as discussed in the *(a) (ii) - (b) (ii)* case where there were no import controls.

(a) (i) - (b) (i) (50 percent reduction for 6 months)

For the reasons just given this case raises essentially the same problems as *(a) (ii) - (b) (i)*.

(3) That Overseas Imports Quadruple

This contemplates overseas imports of 4 million barrels per day which could be expected prior to 1980 if there were no import control program.

Answers to (a) and (b) for this model are as follows:

These answers will deal with the case of no import controls with Exhibit 2 portraying the time sequence.

(a) (ii) - (b) (ii) (100 percent reduction for several years)

This case raises problems similar to *2 (a) (ii) - (b) (ii)* except that if it were to occur the result would be a national catastrophe. At the time the interruption occurred, the nation would be forced to initiate a program of developing 4 million barrels per day of production through conventional methods or by a combination of conventional and synthetics. It would be starting this

assignment under a very severe handicap, inasmuch as the major portion of the exploration and development personnel would have, of necessity, gone into other activities and young men choosing a career would have been discouraged from entering the petroleum industry. A year after the event the task would be to provide 4 million barrels per day plus the 0.9 million barrels per day growth in gap. Two years after the event the task would be 5.8 million barrels per day. This capacity of production would require as a minimum (depleting reserves at 12 percent annual rates) the location and development of 12.2 billion barrels of reserves for 4 million barrels per day producing capacity to 17.6 billion barrels of reserves for 5.8 million barrels per day producing capacity.

Historically, there have been very few years that an active and healthy petroleum industry in the United States has been able to locate and develop over 3.5 billion barrels of reserves per year. It is clearly evident that it would be impossible to start up the domestic industry and return it to the required producing stance for many years. Crash programs for development of synthetics would be required. These programs would be exceedingly expensive, time-consuming and, if successful, would produce much higher cost materials than would have been the case with a sustained petroleum industry with continuity of operations.

As to the specific question regarding what the petroleum industry would do under these circumstances, there is but one answer. It would do everything possible to provide the required petroleum. This would not be good enough, however, to assure the Nation the secure energy position that it has always enjoyed and takes for granted. There would be a period of some years (if and until the expensive synthetics became available) when the United States would need to drastically curtail its petroleum consumption thus endangering the very fabric of the nation. Once more, the larger question is what would the nation be in a position to do about the foreign situation causing the interruption of supplies. If actually engaged in hostilities, the position of the United States could be untenable.

(a) (ii) - (b) (i) (100 percent reduction for 6 months)

Emergency measures might be made sufficient to cope with such a situation. Again it must be understood, however, that in an actual case it could not be known whether the supply interruption would continue for only 6 months. Therefore, the steps described in the preceding case would undoubtedly be started at the outset of the problem. The larger question here is what concessions might the United States be coerced into making for relieving its untenable situation. To deal with such a question would require suppositions regarding the unspecified event leading to the curtailment of supply.

(a) (i) - (b) (ii) (50 percent reduction for several years)

There is also danger in deriving conclusions from the answer to this question inasmuch as the arithmetic poses the question of replacing only 2 million barrels per day. In an actual situation of supply interruption, there will only be a short period of time when overseas imports are 2 million barrels per day. Inasmuch as at that time there will be a continuing growth gap of 0.9 million barrels per day per year, even this rate, coupled with the need to offset two years of widening of the gap, would present requirements of 3.8 million barrels per day producing capacity. The previous assumption of 12 percent annual depletion rates gives reserve finding and development requirements of 11.6 billion barrels. It can be seen that it would be several years before the nation could reestablish its own energy requirements, during which period severe rationing of petroleum products would have to be imposed upon the American public even though the nation might not be involved in major hostilities at the outset of the disruption. Realistically, this situation is not any different from *(a) (ii) - (b) (ii)* since, primarily, the question is of the time when the event occurs that determines the severity of the damage rather than the assumption regarding the amount of imports that will continue to enter the United States. The further along the Nation might be in the liquidation of its domestic petroleum industry, the more severe the problem.

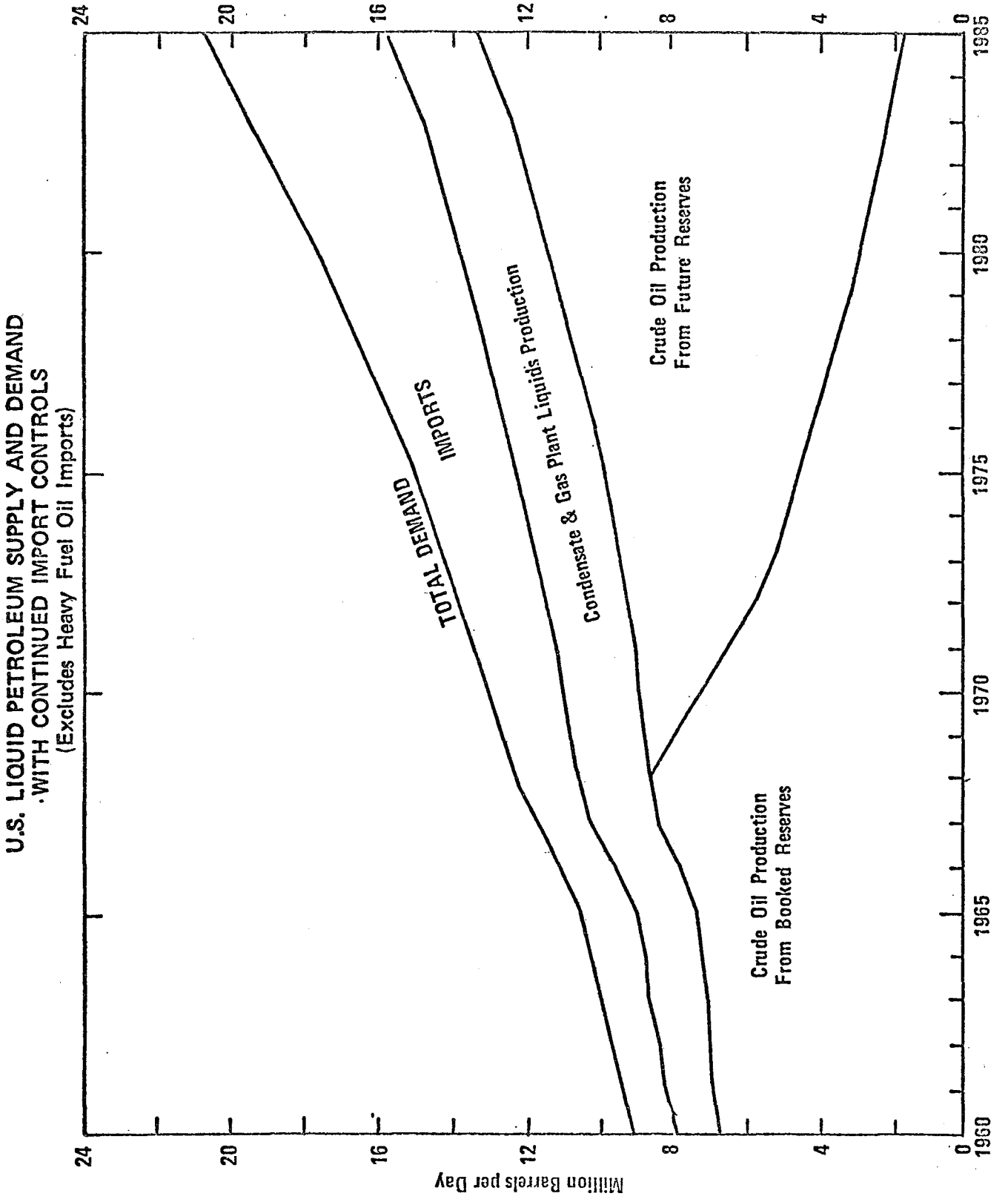
(a) (i) - (b) (i) (50 percent reduction for 6 months)

Here again, there is danger in deriving conclusions based on a simple answer to the question as stated, inasmuch as the arithmetic poses the question as being a reduction of 2 million barrels per day for 6 months. Just answering this simple question makes it seem that storage might deal adequately with the situation. However, the replies to *2 (a) (i) - (b) (i)* are highly applicable to this case.

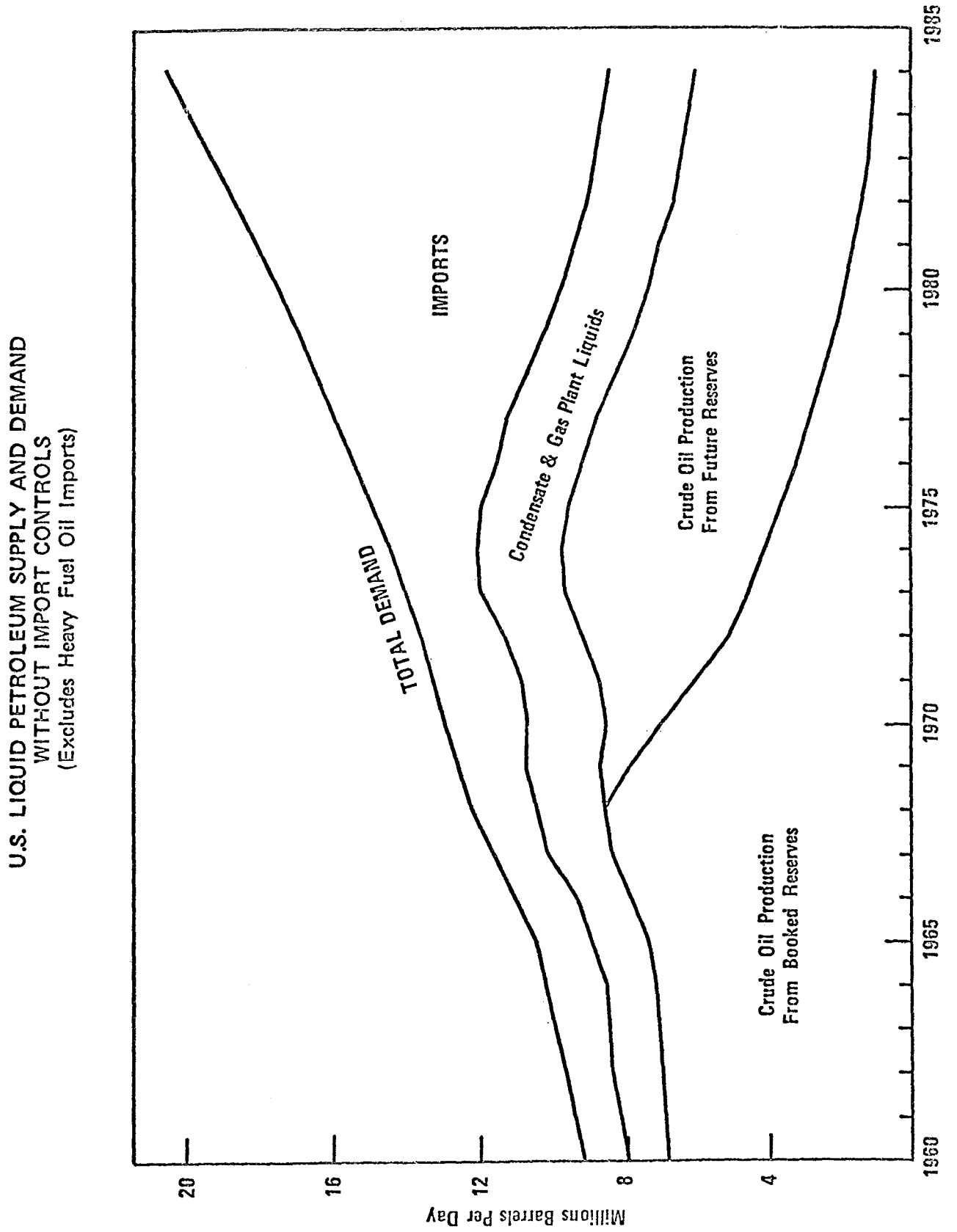
* * *

In responding to this question, no attempt has been made to estimate the costs of the various alternatives that are described in order to cope with various supply interruptions. Suffice it to say that implementation of such alternatives would result in higher costs to the U.S. economy. Experience in Western Europe during the 1956 and 1967 Middle East crises has proven that emergency supply arrangements, including mandatory storage requirements, result in substantially increased costs to the economies.

EXHIBIT 1.



Source: M. A. Wright's Exhibit II, presentation to Subcommittee on Antitrust and Monopoly of Judiciary Committee, U.S. Senate.



Source: M. A. Wright's Exhibit IV, presentation to Subcommittee on Antitrust and Monopoly of Judiciary Committee, U.S. Senate.

CHAPTER THREE

Question No. 8

Residual Fuel Oil Imports

8. If present import levels of residual fuel oils were suddenly discontinued completely for an indefinite period, how would your organization deal with the resulting difficulties, if any?

This question indicates a discontinuance of residual fuel oil imports, but apparently does not comtemplate a simultaneous discontinuance of imports of crude oil. This may be an unrealistic assumption. The question, nevertheless, is answered upon its own terms, namely, that residual imports are discontinued, but crude oil supplies remain adequate.

Total imports of residual type fuel oils in 1968 averaged about 1.1 million barrels per day, of which only 10,000 barrels per day entered the U.S. West Coast while the remainder entered New England, the Mid-Atlantic and Florida. Of these total imports, about 35 percent was consumed by electric utilities, about 55 percent by industry and space heating, and about 10 percent by ships bunkers and miscellaneous users. The small amount of residuals imported into the West Coast could be readily replaced on short notice with either domestic supplies or with natural gas since most users are also equipped to burn natural gas.

Temporary Discontinuance

On an average, there is about 65 million barrels of residual fuel oil in storage, in transit, or otherwise available on short notice. About 20 million barrels of this storage is located in District 1, where essentially all imported residual enters the United States. Another 10 million barrels in inventory, located in Districts 2 and 3, is either available at coastal refineries, marine terminals or can be moved on short notice by inland waterways to deepwater terminals for shipment to District 1. While existing inventories of residual would be drawn down rapidly, with resultant severe dislocations in certain localities, a sudden disruption of offshore supplies of residual fuel oils would not cause other significant difficulties during the initial 20 to 25 days.

Discontinuance for Indefinite Period

In the case of a disruption in offshore residual supplies for an indefinite period, about one month after the onset of the disruption, definite measures would be required on the part of the consumer, the refining industries and federal and state governments. Assuming that at the time of disruption the domestic crude and producing industry are in an active and

healthy posture, with spare capacity to deliver additional oil over an extended period of time, the U.S. petroleum industry could adjust its production and manufacturing phases. By so doing, adequate fuel oil could be provided to replace imported residuals within a reasonable time. Such an adjustment, however, in providing additional supplies of fuel oil would of course involve added costs. However, prudence would require the initiation of the following steps, none of which alone would be adequate to replace residual imports and which in sum may well leave some gap between demand and supply until production and manufacturing could be adjusted.

1. The electric generating industry should review its minimum requirements and determine available excess capacity in grids other than those which would be affected by the disruption of residual imports and transfer that excess to the latter grids.

2. The electric generating plants in District 1 should in the short run, in the few cases where feasible, substitute other fuels.

3. Heavy industry and space heating residual requirements in District 1 should in the short run, where feasible, substitute other fuels although the prospects for availability, deliverability and conversion are not great.

4. Existing spare crude oil producing capacity in the United States should be drawn upon to manufacture fuel oil in U.S. refineries. If necessary, some refineries could be operated to make more fuel oil and distillates and less gasoline by decreasing activity of processing equipment normally used to minimize fuel oil yields such as Delayed Cokers, Visbreakers and Catalytic Cracking Units. Many refineries will have increased crude running capacity when operated for higher fuel oil yield. This type of refinery running would obviously result in higher cost fuel oil and might require shortages in the supply of other products.

5. If residual fuel oils should become critically short for a temporary period of time, certain whole crudes could be substituted directly in power plants and heavy industry to replace residual oils. These whole crudes would require special handling for safety reasons because of their higher volatility, but otherwise would present no particular problems if burned on an intermittent or temporary basis.

These crudes can be made available at deep-water terminals on the Gulf Coast and on the West Coast for shipment to District 1.

6. Since this program would require the movement of substantial additional quantities of crude and fuel oils from the Gulf to East Coast terminals, the present fleet of U.S.-flag tankers would be inadequate to provide transport over a sustained period of time. However, this problem could be met if the Federal Government were to relax the restriction on the use of foreign-flag vessels in coastal trade for a period of time adequate to construct the necessary tankers, barges, and pipelines to cover this movement. There are adequate U.S.-owned tankers under foreign registry which could immediately move into U.S. coastal trade to cover this shortage.

* * *

Any future increases in demand for residual fuel oils will, in all probability, be supplied from overseas sources. Thus, if residual imports were discontinued for an indefinite period of time, at some date in the future when these imports perhaps had grown substantially during the intervening years, the disruption would probably cause much more serious dislocations to the electric power generating industry, to heavy industry and to space heating than in the present case. It would be prudent to review periodically the level of residual imports, the extent of dependency upon them and plans to cope with any supply interruption that might occur.

CHAPTER FOUR

Question No. 14

Effect of Imports
on
Exploration and Conservation

CHAPTER FOUR

14. Do import restrictions conserve domestic reserves for possible emergency use? Do they encourage domestic exploration and thus discovery of significant new reserves sufficient to offset the additional depletion of domestic reserves caused by the substitution of domestic production for imports? Do they have effects on conservation and exploration in District V different from those in Districts I-IV?

The answer to this question should be considered in light of the basic need for import controls to protect our national security. The maintenance of a healthy and growing domestic oil industry assures an adequate long-run supply of domestic production and thus prevents dependence on foreign supply.

Do import restrictions conserve domestic reserves for possible emergency use?

Exploratory activity in recent years has been declining at an alarming rate. Import controls, nevertheless, served to encourage a degree of domestic exploratory and developmental activity which would not have occurred in the absence of such controls. Consequently, the total recoverable oil and gas known to exist in United States is now greater than it would have been without import controls. The oil industry cannot be viewed realistically as a static in institution subject to being frozen and preserved as of a particular moment of time, but rather as a growing, expanding vital force in our economy. Import controls have, by providing opportunity for growth to the domestic petroleum industry, contributed to the maintenance of our total domestic oil reserves.

The extent to which future supplies of petroleum from domestic reserves will be available for possible emergency situations is directly related to the growth of the domestic supply. It is apparent that one of the major factors which has had significant influence in the past and will continue to have influence in the future is the national oil import policy which establishes the level of petroleum imports.

Do they encourage domestic exploration and thus discovery of significant new reserves sufficient to offset the additional depletion of domestic reserves caused by the substitution of domestic production for imports?

Mandatory import regulations, adopted in 1959, were designed to provide a balance between imported crude oil and domestic supply that would result in the maintenance of a healthy domestic oil industry. They have provided a reasonable growing U.S. market for oil imports from other free-world sources as U.S. demand increased. This has also provided opportunity for the domestic industry to continue exploration for and development of new reserves.

There is substantial evidence to indicate that import controls have had a very important impact on the existing and future supply of domestic petroleum. These controls have contributed to the following:

a) During the past 10 years crude oil production in the United States has increased from 2.5 billion barrels in 1959 to 3.1 billion barrels in 1968 which represents a growth of approximately 27 percent. Even with this increasing rate of production, the oil industry has added sufficient reserves to maintain the total oil reserve level at approximately 31 billion barrels, despite increasing domestic production.

b) The industry has explored for and initiated the development of the potentially large reserves in Alaska. This area is recognized as having the potential to make a substantial contribution to the supply of domestic production in the future and may well prove to be one of the major discoveries of the worldwide oil industry.

c) The industry has expended the large capital funds necessary to acquire offshore leases on the Gulf Coast and in California. Exploration and production have now been initiated in these areas which are recognized as having the potential to contribute substantial additions to the domestic reserves.

Do they have effects on conservation and exploration in District V different from those in Districts I-IV?

Although there is a different method of determining import quotas for Districts I-IV as compared to District V, the differences do not have a significant effect on exploration efforts. The control of imports, under both methods of quota determina-

tion, continues to provide the domestic producer with a more attractive market opportunity for his production than would be the case without controls. This market opportunity for product is a vital factor in maintaining a healthy and viable domestic oil industry and is conducive to an active exploration program in the interest of national security.

Conservation as applied to petroleum is the planned wise management of this natural resource to provide reliable supplies of energy at reasonable costs and at the same time to prevent waste, to protect correlative rights, and to control pollution. Conservation is both necessary and desirable. Regulation by the various state agencies is the appropriate way to deal with diverse local conditions. In order to conserve resources and promote equity, the principal producing states have developed regulatory controls over drilling and production operations. These controls have helped to increase recovery of petroleum from reservoirs and to eliminate substantially unnecessary costs.. This, in turn, has resulted in increased recoverable reserves from developed and known petroleum accumulations. Although the control and administration of import quotas is not directly related to conservation, this program does facilitate the tasks of state regulatory bodies in the area of conservation, thereby extending the economic life of wells and reservoirs and insuring maximum recovery of the oil in place. The above-described effect on conservation would not vary whether in District V or Districts I-IV.

CHAPTER FIVE

15. What is your estimate of the supplies of crude oil likely to become available in the world outside Communist China, the Soviet Union, and other members of the Warsaw Pact:
(a) Production of crude oil, by major supply areas, 1970, 1975, and 1980;
(b) Spare productive capacity, by major supply areas, 1970, 1975, and 1980;
(c) Proved reserves of crude oil, by major supply areas, 1970, 1975, and 1980?

(Production, and productive capacity and proved reserves in the United States should be included as a major supply area; assume that present import restrictions continue through 1980. Exports from the Soviet Union to the non-Communist world, if any, should be estimated and included as a separate item.)

16. What is your estimate of the final consumption demand for crude oil and equivalent products in the world outside the Communist bloc in 1970, 1975, and 1980? Estimate by major market areas:
(a) Western Europe;
(b) Japan;
(c) Other Asia and Africa;
(d) United States;
(e) Other North America;
(f) Australia--New Zealand;
(g) South America;

(NOTE: Use crude-oil equivalent barrels for product demands. As in question 15, assume that present import restrictions in the United States continue through 1980.)

The world petroleum environment continually changes as industry, governments, and people respond to new and changing developments, situations and pressures. In this environment long-term forecasts of oil supply and demand must, of necessity, be based on many critical assumptions, of which the U.S. import control restriction assumption is only one.

Consumption

The National Petroleum Council does not make forecasts of this type and the time limitation of this study would preclude a new demand study, but there are available some carefully considered published forecasts that may be combined to yield the desired numbers. The following estimated ranges of oil consumption in 1980 by major marketing areas (see Table 1) are based on such a compilation of published forecasts to 1980, including the Department of the Interior's *U.S. Petroleum Through 1980,* Canadian National Energy Board's *Preliminay Long Range Forecast,* O.E.C.D.'s *Energy Policy--Problems and Objectives* (covers Western Europe and Japan), and E.E.C.'s *Energy Series #1--World Energy Trends* (covers free world, including Latin America, Asia, Oceania, and Africa).

The figures as shown in Table 1 for the year 1968 and Column A under year 1980 were drawn from these just-mentioned sources. In total they reflect the low side of the estimated 1980 free-world consumption range. Column B under year 1980 is based on the higher forecast levels of several oil companies that included such projections in their recent submissions to the Cabinet Task Force questionnaire on Import Controls. These latter figures reflect the high side of the estimated 1980 free-world consumption range.

TABLE I

FREE WORLD OIL CONSUMPTION

Million Barrels Daily

Major Marketing Area	Oil Consumption			Percent of Total Free World			Average Annual Percent Change 1980/68	
		1980			1980			
	1968	A	B	1968	A	B	A	B
United States	13.4	18.2	18.7	41.1	33.3	28.9	3.0	3.3
Other North America	1.4	2.0	2.5	4.3	3.7	3.9	3.6	6.5
Latin America	2.3	5.0	5.4	7.1	9.1	8.4	9.8	11.2
Sub-Total Western Hemisphere	17.1	25.2	26.6	52.5	46.1	41.2	4.0	4.6
Western Europe	9.9	16.2	22.3	30.4	29.6	34.5	5.3	10.4
Japan	2.7	7.0	8.5	8.3	12.8	13.1	13.3	17.9
Other Asia & Africa	2.4	5.3	6.2	7.3	9.7	9.6	10.1	13.2
Oceania	.5	1.0	1.0	1.5	1.8	1.6	8.3	8.3
Sub-Total Eastern Hemisphere	15.5	29.5	38.0	47.5	53.9	58.8	7.5	12.1
Total Free World*	32.6	54.7	64.6	100.0	100.0	100.0	5.7	8.2
Free World (Excl. U.S.)	19.2	36.5	45.9	-	-	-	7.5	11.6

* Excludes U.S. Military Overseas - .5 MB/D in 1968.

These forecasts indicate:

1. Oil consumption in the United States should increase at an average annual growth rate of about 3 percent, or from about 13 million barrels per day in 1968 to between 18-19 million barrels per day by 1980. Oil accounted for about 45 percent of all energy consumed in the United States in 1968. By 1980, that share will probably decline moderately to around 40 percent. Oil's growth should not keep pace with that of total energy because of its small (7½ percent) share of the electric generation market, the fastest growing energy sector. In addition, oil should experience continued strong competition from natural gas and electricity in the residential, commercial and industrial markets. Oil should not be hurt by the advent of nuclear power as only 4 percent of all oil is consumed for power generation.

2. Major use of oil in the United States will most likely continue to be in transportation, which today accounts for 57 percent of oil demand, and which should increase to around 62 percent by 1980. About 42 percent of oil's total growth to 1980 should be in motor gasoline, 22 percent in jet fuel, and around 10 percent in other transportation fuels--mostly diesel. The major part of the balance (26 percent) will most likely be used in petrochemicals (12 percent) and the remainder distributed about equally between heating and industrial fuels and nonfuel products such as asphalt, lubes and coke.

3. Oil consumption in the free foreign countries should almost double or more by 1980, jumping from 19 million barrels per day in 1968 to between 36-46 million barrels per day by 1980. This range amounts to an average annual growth of between 7½ percent to over 11 percent, and will probably cause oil's share of the free foreign energy market to increase from 58 percent in 1968 to around 65 percent by 1980. Western Europe could account for almost 50 percent of the free foreign oil consumption increases between 1968 and 1980, Japan for over 20 percent, Latin America for about 10 percent, and Canada almost 5 percent.

Supply

The NPC has, in the past, forecasted the future U.S. productive capacities,[1] but time limitations preclude a new study to answer Question 15. The NPC report entitled *Impact of New Technology on the U.S. Petroleum Industry, 1946-1965* has some bearing on the answer to this question as it pertains to the United States. This report points out that with adequate incentives, U.S. crude oil production could meet the increased U.S. requirements of the decade of the 1970's. The trends of recent years in wells drilled, proved reserve additions, and productive capacity indicate that the present incentives to producers probably are not adequate to assure that U.S. crude productions will be capable of supplying U.S. requirements through 1980. The testimony of Mr. M. A. Wright before the Senate Subcommittee on Antitrust and Monopoly (see answer to Question 7) bears this out.

Unless present trends can be reversed upward by major new oil discoveries in the Arctic or elsewhere in the United States, the Nation will ultimately be forced toward increased dependence on either foreign crude or fuel from unconventional sources, or both. If it adopts petroleum policies which make further exploration in the United States substantially less attractive, the U.S. Government would be opting for increased reliance on foreign crude supplies. This course of action would involve the assumption of considerable, albeit unnecessary, risks and exposure to a potentially dangerous position vis-a-vis the U.S.S.R. Only Russia and the United States among the world's major powers have the choice of self-sufficiency in oil and energy. The U.S.S.R. has already made its choice.

Crude oil reserve and production data reported in the December 30, 1968, *Oil and Gas Journal* (pp. 102-103), shows that free world crude oil reserves *overall* are so great that even with only minimal reserve additions over the next 10 years, crude should be abundantly available to meet 1980 free-world demands, barring some major political upset (see Exhibit 1). According to this *Oil and Gas Journal* report, some 60 free foreign countries had some crude oil reserves and production in 1968. Most of these countries, however, produce relatively small amounts. At the present time, these large foreign supplies of crude oil are concentrated in relatively few countries.

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[1] See NPC report of July 19, 1966, *Estimated Productive Capacities of Crude Oil, Natural Gas and Natural Gas Liquids in the United States (1965-1970).*

Experience tells us that no highly accurate forecast of the distribution of supply--or of sources of supply to importing areas--can be made very much into the future, certainly not 10 years or 13 years. As illustrated in Exhibit 2, this decade has seen, for example, Libya's boom into prominence in world oil supply. We know of no forecast made 10 years ago or even 5 years ago which even closely approximated the phenomenal rise that has occurred.

The next decade presents equal uncertainties. Worldwide exploration continues strong, both in new areas and in areas strongly suspected or known to contain major oil reserves not yet proved. An outstanding example is the U.S. and Canadian Arctic area. The potential of this region is suspected to be enormous; but firm knowledge of proved and ultimate recoverable reserves and productive capacity is almost nonexistent, even for those companies involved in the initial development phase.

In view of the concentration of oil reserves and production in a small area of the world and among a small group of nations, it would be intolerable, in our view, for the United States to become increasingly dependent on foreign supply; or to permit domestic reserves and productive capacity to decline, by eliminating or reducing the incentives and the market assurance which stimulate domestic exploration and development of new production in areas such as the Arctic. Without import controls and the market assurance they provide, present incentives would not be adequate to promote the secure domestic oil supply, which is vital to this country's national security.

Worldwide oil at a glance

COUNTRY	RESERVES		WELLS		OIL PRODUCTION			REFINING		
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-68	Drilling 12-1-68	Estimated 1968, 1,000 b/d	% Change from 1967	No. opr. refs.	Capacity (1,000 b/d), Jan. 1, 1969		
								Crude	Cracking	Reforming
ASIA-PACIFIC										
Afghanistan	*100,000	5,240	3	2	0.1	....	....	....	....	....
Australia	2,500,000	16,000	230	19	45.0	106.4	11	580.5	162.9	108.9
Brunei-Malaysia	600,000	650	542	2	121.2	7.9	6	302.0	....	20.4
Burma	40,000	125	38	6	14.3	19.1	2	26.3	1.7	....
India	1,500,000	1,500	851	30	129.0	2.7	8	386.2	73.7	27.0
Indonesia	8,850,000	2,500	2,040	15	582.2	14.8	5	268.2	49.5	15.0
Japan	35,000	250	921	22	15.9	....	38	2,692.2	106.1	280.8
Korea, South	....	....	....	....	....	....	1	115.0	....	7.0
New Zealand	26,000	*500	0	2	....	....	1	63.0	....	21.0
Pakistan	50,000	25,000	14	4	9.9	−0.1	4	115.1	....	4.4
Philippines	....	....	0	1	....	....	4	180.0	29.1	24.5
Taiwan	19,000	959	30	12	0.6	....	2	129.1	10.0	7.5
Thailand	200	....	28	2	0.2	....	3	62.2	20.0	8.6
Total Asia-Pacific	**13,720,200**	**52,724**	**4,697**	**117**	**918.4**	**13.9**	**85**	**4,919.8**	**452.9**	**525.1**

*Condensate. New Zealand to go on production in 1969.

EUROPE										
Austria	200,000	800	1,281	5	47.1	−15.5	3	97.1	16.0	9.0
Belgium	....	....	....	....	....	....	7	628.6	79.1	65.3
Denmark	....	....	....	2	....	....	5	167.9	30.0	33.1
Finland	....	....	....	....	....	....	2	176.5	20.0	33.3
France	185,000	8,500	325	17	51.8	−8.4	20	2,154.8	185.1	312.8
Greece	....	....	....	....	....	....	3	95.0	....	14.5
Ireland	....	....	....	....	....	....	1	54.0	....	14.5
Italy (incl. Sicily)	275,000	6,500	133	26	27.4	−13.0	38	2,886.8	172.8	327.3
Netherlands	300,000	82,176	390	10	42.9	−0.4	7	872.4	90.5	122.8
Norway	....	....	*	2	....	....	3	113.0	15.0	19.5
Portugal	....	....	....	....	....	....	1	37.0	14.0	....
Spain	14,000	....	21	5	4.5	164.7	8	678.4	16.5	119.5
Sweden	....	....	....	....	....	....	5	244.0	35.0	45.5
Switzerland	....	....	....	1	....	....	2	100.0	16.0	18.3
United Kingdom	8,000	30,000	45	7	2.0	17.6	22	2,071.4	174.5	278.3
West Germany	720,000	10,200	3,244	31	157.3	0.5	34	2,351.4	346.8	314.8
Yugoslavia	235,000	3,000	....	13	49.6	2.9	5	156.0	33.5	20.0
Total Europe	**1,937,000**	**141,176**	**5,439**	**119**	**382.6**	**−3.1**	**166**	**12,884.3**	**1,244.8**	**1,748.5**

*Two gas-condensate wells discovered in 1968 not yet producing.

MIDDLE EAST										
Abu Dhabi	18,000,000	7,500	86	3	511.3	33.2	....	....	....	....
Aden	....	....	....	....	....	....	1	178.0	....	14.0
Bahrain	170,000	100	205	1	75.0	8.3	1	205.0	56.0	35.0
Dubai	1,000,000	500	*	....	....	....	....	....	....	....
Iran	54,000,000	100,000	212	12	2,842.2	9.4	5	632.0	16.0	81.5
Iraq	28,000,000	20,000	111	2	1,496.9	2.1	6	82.9	14.0	8.0
Israel	15,000	75	36	4	†93.0	290.7	1	115.0	13.0	22.0
Jordan	....	....	....	1	....	....	1	7.5	1.4	0.9
Kuwait	69,000,000	39,100	684	1	2,442.4	6.5	3	489.0	....	19.9
Lebanon	....	....	....	1	....	....	2	36.5	....	6.8
Muscat-Oman	2,500,000	1,500	35	2	237.7	315.5	....	....	....	....
Neutral Zone	15,000,000	4,000	38	4	426.1	2.4	2	80.0	....	1.0
Qatar	3,875,000	7,300	65	2	341.1	5.8	1	0.6	....	....
Saudi Arabia	77,000,000	43,000	388	5	2,843.2	11.2	3	315.0	....	37.5
Syria	1,500,000	500	30	3	27.0	(‡)	1	22.0	....	2.5
Turkey	700,000	200	233	2	49.0	10.3	3	133.0	10.5	14.1
Total Middle East	**270,760,000**	**223,775**	**2,123**	**43**	**11,384.9**	**13.9**	**30**	**2,296.5**	**110.9**	**243.2**

*Fateh field (3 oil wells) to begin production early in 1969. †Includes captured Sinai peninsula fields. ‡Began production mid-1968.

COUNTRY	RESERVES		WELLS		OIL PRODUCTION			REFINING		
	Oil (1,000 bbl)	Gas (billion cu ft)	Producing oil 7-1-68	Drilling 12-1-68	Estimated 1968, 1,000 b/d	% Change from 1967	No. opr. refs.	Capacity (1,000 b/d), Jan. 1, 1969		
								Crude	Cracking	Reforming
AFRICA										
Algeria	7,000,000	135,000	699	18	898.7	10.2	2	46.5	....	13.0
Angola	50,000	125	29	10	11.0	....	1	14.0	....	1.0
Cabinda	450,000	500	*	5	†6.0	....	....	....	....	....
Congo-Brazzaville	6,800	....	5	1	2.0	....	....	....	....	....
Congo-Kinshasa	1,000	....	0	1	....	....	1	13.8	....	3.5
Dahomey	20,000	....	**	1	....	....	....	....	....	....
Egypt	2,100,000	2,800	162	6	179.6	67.3	3	175.0	5.3	14.0
Ethiopia	....	....	0	....	....	....	1	11.0	....	2.0
Gabon	465,000	4,500	96	2	89.8	29.2	1	12.5	6.5	1.5
Ghana	....	....	0	....	....	....	1	29.0	....	6.5
Ivory Coast	....	....	0	....	....	....	1	19.0	....	2.7
Kenya	....	....	0	....	....	....	1	44.0	....	4.6
Liberia	....	....	....	....	....	....	1	10.0	....	2.0
Libya	30,000,000	20,000	790	28	2,535.0	45.3	1	9.5	....	2.2
Malagasy	....	....	0	....	....	....	1	12.0	....	2.0
Morocco	8,000	20	53	2	2.0	....	2	35.0	4.0	7.7
Mozambique	....	1,000	0	2	....	....	1	20.0	....	2.7
Nigeria	4,000,000	3,900	37	13	93.0	−70.8	1	40.0	....	4.6
Rhodesia	....	....	0	....	....	....	1	20.0	13.5	3.0
Senegal	....	....	0	1	....	....	1	12.6	....	1.7
Sierra Leone	....	....	....	....	....	....	1	10.0	....	....
Sudan	....	....	0	....	....	....	1	10.0	....	1.4
Tanzania	....	....	0	....	....	....	1	13.8	....	3.5
Tunisia	468,000	500	40	3	47.8	1.9	1	22.5	....	3.3
Union of South Africa	....	....	0	3	....	....	4	165.9	29.1	47.2
Total Africa	**44,568,800**	**168,345**	**1,911**	**96**	**3,864.9**	**24.0**	**29**	**756.1**	**58.4**	**130.1**

*In November, 1968, 36 wells began production at 30,000 b/d. †Production commenced in Nov. 1968.
**Two oil wells completed in 1968—may go on stream in 1969.

WESTERN HEMISPHERE										
Argentina	3,100,000	8,500	4,968	22	342.8	16.7	14	445.8	222.3	10.0
Barbados	1,000	....	2	1	....	....	1	3.0	....	....
Bolivia	585,000	5,000	212	8	37.0	−7.0	4	14.0	....	....
Brazil	850,000	1,000	920	5	160.3	9.2	11	462.4	86.9	38.7
British West Indies	....	....	0	....	....	....	1	11.0	....	1.8
Chile	136,000	3,000	313	4	38.0	10.4	2	90.0	24.6	9.1
Colombia	1,700,000	3,500	2,183	4	179.8	−4.7	6	138.9	76.0	....
Costa Rica	....	....	0	....	....	....	1	8.0	3.0	1.2
Cuba	275	....	10	1	0.5	....	3	93.0	24.0	15.6
Ecuador	325,000	150	249	3	7.0	12.9	3	37.0	6.0	....
El Salvador	....	....	0	....	....	....	1	13.5	....	2.5
Guatemala	....	....	0	1	....	....	2	20.5	....	5.9
Honduras	500	....	0	....	....	....	1	10.0	....	1.6
Jamaica	....	....	0	....	....	....	1	28.0	....	3.0
Mexico	5,500,000	11,500	2,948	90	383.5	4.3	6	575.5	141.8	75.2
Netherlands Antilles	....	....	0	....	....	....	2	795.0	504.0	37.0
Nicaragua	....	....	0	1	....	....	1	7.8	....	1.7
Panama	....	....	0	....	....	....	1	70.0	30.0	8.5
Paraguay	....	....	0	....	....	....	1	5.0	....	....
Peru	475,000	1,750	2,537	12	80.3	13.4	5	103.6	23.9	....
Puerto Rico	....	....	0	....	....	....	2	155.0	70.5	13.5
Trinidad	610,000	1,000	3,397	10	187.1	5.0	3	417.0	38.5	32.0
Uruguay	....	....	0	....	....	....	1	40.0	5.0	4.0
Venezuela	15,500,000	27,500	10,088	28	3,625.5	2.3	12	1,340.5	184.9	22.3
Virgin Islands	....	....	0	....	....	....	1	100.0	....	6.0
United States	32,500,000	294,300	713,000	2,172	9,153.2	3.8	269	11,658.0	5,779.7	3,656.8
Canada	9,900,000	46,500	21,957	260	1,023.0	6.2	42	1,305.7	532.2	507.3
Total W. Hemisphere	**71,182,775**	**403,700**	**762,784**	**2,622**	**15,218.0**	**4.0**	**397**	**17,948.2**	**7,753.3**	**4,453.7**
Total Free World	**402,168,775**	**989,720**	**776,954**	**2,997**	**31,768.8**	**9.7**	**707**	**38,804.9**	**9,620.3**	**7,100.6**
Russia and other communist areas	***55,877,000**	****343,000**	....	....	**6,684.1**	**6.7**	...	....	....	....
Total World	**458,045,775**	**1,332,720**	....	....	**38,452.9**	**9.2**	...	....	....	....

*Includes (in 1,000 bbl) U.S.S.R. 40,000,000; Romania 750,000; Hungary 50,000; Albania 19,000; Czechoslovakia 12,000; Poland 20,000; Bulgaria 15,000; East Germany 11,000; and Red China 15,000,000. **Includes (in billion cu ft) U.S.S.R. 325,000; Red China 2,500; and 15,500 for all East European satellites.

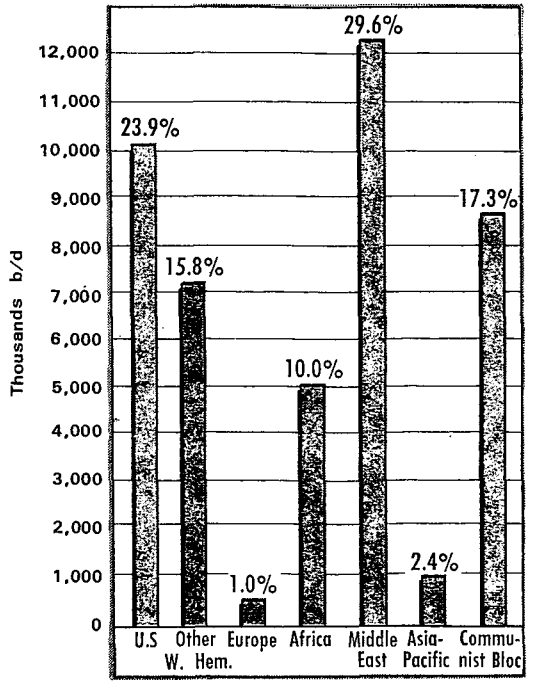
CHAPTER FIVE

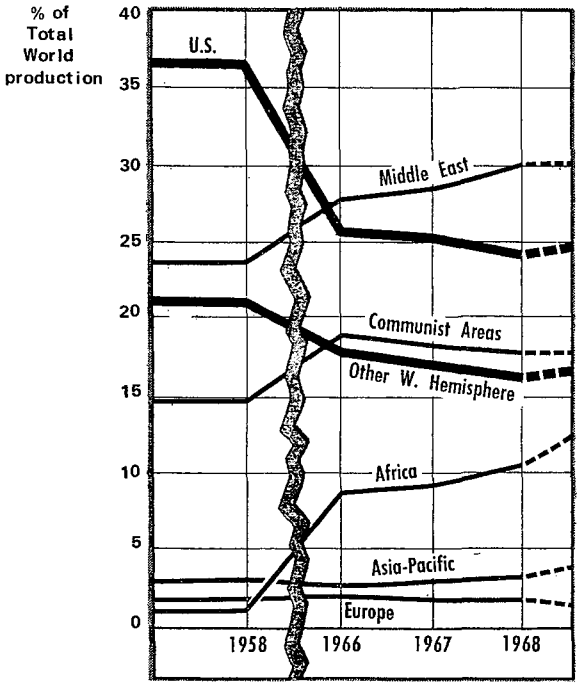
Questions No. 15, 16 and 17

Free-World Supply and Demand

EXHIBIT 2.

WHERE WORLD GOT OIL IN '68 . . . AND HOW SUPPLY PATTERN IS CHANGING





17. With respect to the above and similar questions, how reliable are the statistical estimates of proved reserves, ultimate reserves, productive capacity, maximum efficient rate of production, and deliverability?

The estimates of "proved reserves" and "ultimate recovery" as defined and reported annually by the American Petroleum Institute and American Gas Association for the United States, the Canadian Petroleum Association for Canada, and the *Oil and Gas Journal* for other foreign countries, can be regarded as reliable bases for evaluating prospects for future supplies of oil and gas subject to the following qualifications:

1. "Proved reserves" are the estimated quantities which geological and engineering data demonstrate with reasonable certainty to be recoverable from known reservoirs under existing economic and operating conditions. "Ultimate recovery" represents the estimated quantities which have been produced from a reservoir and which are expected to be produced in the future if there are no substantial changes in present economic relationships and known production technology. Accordingly, the current estimate is the sum of cumulative production to date plus the current estimate of proved reserves. As defined and as of any given year, these estimates tend to be conservative because future drilling will continue to find additional oil in known fields for many years to come and it normally takes several years of drilling after discovery to define accurately the limits of a new field. Also, recovery technology can be expected to advance over time.

2. The precise definitions and procedures used to determine the annual estimates must be fully recognized and understood to evaluate accurately and interpret trends inherent in the historical statistical data series. Moreover, trends are at least as important as the absolute volume levels reported in judging prospects for future supplies of oil and gas.

3. The data for foreign reserves are, in general, less well-defined than in the United States and Canada. Thus, these data particularly should be viewed mainly from a standpoint of trends and general level rather than as precise volumes. This is not to say, however, that data as reported by the *Oil and Gas Journal* for these foreign countries are not useful in evaluating and judging prospects for supplies of oil and gas.

4. Finally, it must be emphasized that the amount of oil or gas in a given deposit that can be recovered profitably varies with changes in economic conditions and with advances in technology.

Reserve estimates are concerned with the quantity of oil or gas available to be produced over an indefinite period of time. Estimates of "productive capacity," "maximum efficient rate of production," and "deliverability" are concerned with the rates at which proved reserves can be produced at a particular point in time. Each of these phrases has a specific and closely defined meaning when applied to oil industry operation.

Productive capacity is normally used in connection with large areas, such as states and countries. It can be applied to hypothetical or actual conditions. Thus, productive capacity as defined by the National Petroleum Council in its periodic reports, differs from productive capacity as defined by the American Petroleum Institute or by the Independent Petroleum Association of America.

The "maximum efficient rate of production" is primarily an engineering term which defines the maximum rate at which an oil well or an oil field can be produced without impairing the characteristics of the well or field in such a way as to reduce the total ultimate economic recoverability of oil. In some states the maximum efficient rate of production has to be registered with the State Conservation Commission, and this rate is used as a basis for setting permissible production levels. It is important to recognize that the maximum efficient rate of production for a given well or field is not a static concept. Rates may be revised upwards or downwards as further development and production take place. Except in states which practice market demand proration, there are no generally available data on maximum efficient rates of production for specific fields. And even in these states the data on file may not reflect the current situation at any particular point in time. Reported data on productive capacity and maximum efficient rates of production are, in general, limited to the U.S. and Canadian oil industries. In other areas of the world, particularly where the oil fields are highly prolific, these concepts have no practical significance, since they are not factors which limit oil production.

In all areas of the world, the controlling factor in oil production is deliverability. This is the amount of oil that can be moved from the producing area to the refining area and thence to the ultimate market. The limitations may be field gathering systems or pipeline capacity, tankage, tanker loading or discharging facilities, or the availability of tankers

themselves. In general, the overall limitation on crude oil deliverability is usually a result of a combination of some of these factors.

From time to time studies have been made of the availability of oil in the United States, Canada, and overseas. These studies may be considered reliable for a particular point in time or for a particular set of circumstances, but the rapid growth of oil demand around the world, and the constant rate of flux of world oil supply patterns causes these studies to be rapidly outdated.

A number of limitations and conditions directly affect the practical value of these estimates, particularly productive capacity and availability. It is the user's responsibility to select the one best suited to his purpose. Like proved and ultimate reserve estimates it is essential that the definitions, procedures, and criteria used to make the estimates be fully recognized and understood to accurately interpret trends. And, it must be recognized that trends are as significant as absolute volume levels in judging prospects for future supplies of oil and gas. As is the case with most estimates there is bound to be some error. However, unlike most estimates it is difficult--if not impossible--to measure accurately or determine how large or small the degree of error may be, as actual circumstances or conditions that would permit a realistic check or test of these rate-of-availability estimates have not existed since the domestic petroleum industry was last producing at capacity about 20 years ago.

Nevertheless, a number of estimates, in general well-regarded within the petroleum industry, have been made to measure productive capacity and availability. In particular, the estimates made by the Independent Petroleum Association of America, American Petroleum Institute, Interstate Oil Compact Commission, National Petroleum Council and some State conservation agencies have served as extremely useful bases for evaluating the prospects for future supplies of oil in the United States as well as specific areas within some states. The estimates made by the Canadian Petroleum Association, National Energy Board, and the Alberta Oil and Gas Conservation Board have been similarly helpful in appraising future supplies of oil in Canada.

There have been only a few estimates of productive capacity and availability published for other foreign countries that can be regarded as reliable as the U.S. or Canadian estimates for purposes of evaluating and judging prospects for future supplies of oil. The current low production/reserve ratios in most major foreign producing countries--particularly those in the Middle East--suggest that in many cases there is little, if any, need for such estimates at this time.

CHAPTER SIX

Question No. 19

Cost of Foreign Crude

19. What are the delivered costs of foreign crude oil and oil products, by types and grades, imported into the United States, by principal supply area and by principal points of delivery, and what are the main elements in those costs? What were those costs in 1955, 1960, 1965, and 1968? What would the cost be in 1975? 1980?

The fact that this question asks for delivered costs of crude oil and oil products for several selected years implies that figures accurate enough to show a time trend are available. The data for individual years are so fragmented and unreliable as to conceal any time trends that might be present. For this reason and because the NPC may not forecast these data, the response will be directed at the present.

There are three types of costs that make up the delivered cost of foreign crude oil. These are (1) the costs of finding, developing and producing crude oil; (2) the royalties and taxes paid to the producing country government; (3) the costs of transporting and importing the crude oil.

Estimates of the costs of finding, developing and producing foreign crude oil present all the many problems of estimating these costs for U.S. crude oil (see discussion of Question 20). An additional critical problem in the case of foreign oil is the lack of published data on costs. There is no foreign equivalent of the *Joint Association Survey* or the API proved reserves report, and a search of recent publications, including testimony before the Senate Committee on Antitrust and Monopoly, revealed only scattered data, so fragmentary or unreliable as to be unrepresentative. Thus, for foreign areas, in contrast to the situation in the United States, there is not even a base of fundamental data for the researcher to analyze.

As one studies these costs, the following kinds of problems come to mind for which there are no reliable means for resolving. For example, how does one determine the exploration costs that have been incurred in substantially varing degrees and dollar amounts by the many companies engaged in finding and developing crude oil reserves in many differnet parts of the world? And as a further example, how does one allocate the total exploration losses incurred by any one company in a given year?

By way of a specific example, consider the relatively large number of U. S. companies that have been and are currently engaged in finding, developing, producing, and moving to market Venezuelan crude oil. The worldwide exploration, producing, supply, refining, and marketing operations of these companies vary in the extreme. Because of the vastly diverse experience of these companies, it is very unlikely that any of them would have similar costs for essentially the same type of Venezuelan crude, far less the various grades of Venezuelan crude. And, of course, the methods used in determining of costs is undoubtedly subject to great diversity among industry participants.

The second category of costs, producing country royalty and income tax, presents fewer problems, but also has many pitfalls. Both are treated as elements of current cost and are usually calculated on a per-barrel basis. Royalty is customarily one-eighth of the posted price. Most countries that are members of the Organization of Petroleum Exporting Countries (OPEC) determine income tax as one-half the difference between the price on which taxes are calculated and the sum of producing expense and royalty. Reference (1) indicates an average government income from producing operations (royalty plus income tax) of 82¢/bbl. in the Middle East, about 60¢/bbl. of which was income tax, in 1968. These averages in Africa are $1.00/bbl. (72¢ income tax) and in South America are 98¢/bbl. (68¢ income tax).

Use of averages can be misleading even in these items. The laws governing royalties and taxes vary greatly from country to country, and a producing company will customarily spend large sums on leases and exploration when first entering a country. If the company finds oil and starts producing, its income taxes may be small until the company recovers its large initial expenditures through oil revenue. At this point, the company's taxes may increase sharply. And, in addition, there are instances in which a host country imposes special tax assessments that are not reflected in the items described above. Only through knowledge of the particular country laws and company situation can taxes be estimated at even the correct order of magnitude. Even if the tax rates remain constant, income tax per barrel in most of the countries which are members of the OPEC will increase through 1974 as the "OPEC Allowances" are phased out. In 1965, governments in the Middle East and Libya recognized an OPEC discount of about 7½ percent off the 1965 posted price. Currently, it

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(1) *Petroleum Press Service*, August 1968, p. 302

amounts to about 4½ percent off the posted price in the Middle East but does not apply at Eastern Mediterranean export terminals for Middle East crudes nor in Libya as long as the Suez Canal remains closed. This "discount" is scheduled to be reduced each year, becoming about 3½ percent in 1970 and zero by 1972. In general, producing country per-barrel taxes have been increasing and there is no basis to anticipate a reversal of this trend.

The third category of costs, transportation and duties, like the second, can be treated in a general way, but generalizations can be misleading. U.S. customs duties are assessed on a per-barrel basis and since they are published, present no problem. A good measure of historical ocean freights is the Average Freight Rate Assessment (AFRA) as reported by the London Tanker Brokers Panel. For 1968, this service indicated an average ocean freight from the Persian Gulf to U.S. East Coast of about $1.00 per barrel, from North and West African ports of about 45¢ per barrel, and from various South American ports 20¢ to 50¢ per barrel depending on the origin and destination ports.

Averages such as quoted here give only a very general approximation of freight rates. In using AFRA because of the fluctuations in rates, care should be taken to use figures for the exact voyage and exact time being considered. Extrapolation of historical averages into the future should be attempted only with considerable expertise in the tanker market. Tanker rates are quite sensitive to shortages and surpluses of tankers, and rates fluctuate.

Even if it were possible to provide reliable historical average costs of delivery of certain foreign crudes to the U.S. East Coast, past experience indicates that it would be extremely dangerous to attempt extropolation into the future from those costs. As major consuming areas become increasingly dependent upon foreign overseas sources of supply, there is a decided tendency for governments of oil exporting countries to increase their taxes on oil. Should the United States abandon its position of self-sufficiency in petroleum and, like the major consuming countries of Western Europe, become highly dependent on overseas foreign oil, past and present trends would become meaningless, and some very large increases in petroleum costs would be possible and even probable.

CHAPTER SEVEN

Question No. 20

Cost of Domestic Petroleum

20. What is the average delivered cost of domestic oil and bulk oil products in the United States, by types and grades, by principal production area and market area, and what are the main elements in these costs (include data for most recent period available):

Well head costs, per barrel:
Exploration costs, including lease costs.
Drilling and equipment costs.
Production costs, including royalties.
Transportation costs (crude), including gathering cost.
Refining costs.
Transportation costs (products) to bulk terminals.
Specify taxes per barrel as a separate element.

Use as the sample production areas:

Louisiana--Texas Gulf Coast, including offshore.
Mid-Continent.
Permian Basin--West Texas.
California.
Southern Alaska.

Use as sample marketing areas:

New England.
Middle Atlantic.
Great Lakes: Chicago-Cleveland.
Seattle.
Los Angeles.
Hawaii.
Texas Gulf Coast, including points of transshipment.

Finding and Developing Costs

For years many individuals in and out of the oil industry have struggled to arrive at the proper concept for determining the cost of finding, developing and producing crude oil and natural gas. No generally acceptable concept has been established to date. The industry has, for a number of years, cooperated in an annual joint Association survey to obtain data which might be helpful in indicating *trends* in overall expenditures. The

survey is sponsored jointly by the American Petroleum Institute, Independent Petroleum Association of America and Mid-Continent Oil and Gas Association. Representatives of industry and government are continually reviewing and modifying this program so that the results generally conform to the census of oil and gas production undertaken by the Bureau of Census every 5 years.

These census records, which report expenditures by subdivisions of the United States, reveal the wide variations in expenditures for the exploration, development and subsequent production of petroleum. However, many of these expenditures cannot be associated directly with any reserves found. Analysis of those expenditures that can be associated with a particular reserve is further obscured by the difficulty in (1) precisely determining the reserves found, and (2) in allocating those costs between the oil and gas to be produced.

Data on oil and gas produced in the United States are readily available. The U.S. Bureau of Mines figures are considered the best source by most analysts. The American Petroleum Institute and the American Gas Association, jointly, estimate proved oil and gas reserves (including estimates of additions to proved reserves) each year for the United States, and the Canadian Petroleum Association does this for Canada. Although proved reserves additions can be estimated with fair accuracy, there is no general agreement on a method for estimating the total volume of oil or gas discovered in a given year.

The problem of allocation of costs between oil and gas has been debated before Federal Power Commission examiners for the last 15 years, and the various parties concerned are not much closer to agreement than they were 15 years ago. Crude oil sells for about 3 times as much per BTU of energy at the wellhead as does natural gas. Both are used primarily as fuels and have intrinsic value for their potential energy. Do you allocate costs on an energy basis and charge costs to gas out-of-proportion to its revenue? Or do you allocate costs on revenue and thus tend to perpetuate relative prices that may be grossly inequitable? Or should you abandon both methods and allocate costs on the basis of successful wells completed? Equally competent experts disagree vehemently on this subject.

Even more difficult is the question of how much oil or gas has been found by a given exploratory expenditure. Proved reserves are of little help in determining this. Expenditures for leases by a given company in a given year may result in discoveries of oil or gas 5 or even 10 years later. After the discovery well is drilled, it is not impossible to decide how many barrels to allocate to that expenditure, but in the interval before discovery, what barrels, if any, do you attribute to those leases? Even after the discovery of oil or gas and assuming you can now

estimate the dollars spent on leases, geological and geophysical work and drilling to make this discovery, you have to decide how large this field will be, how many pay zones and how thick, and what recovery mechanism the field will have. The proved reserves of a large oil field may generally be expected to increase for 20 years. A statistician can take the increase in reserves for the first few years and extrapolate it to time infinity, but this process is subject to very large errors on a single field, and even on a large group of fields, it is not a highly reliable process.

Because of these factors, most analysts in the oil and gas producing industry feel that industry groups and associations can only assemble data on expenditures, revenues, proved reserves, etc., on a very broad sample basis (usually the entire United States for a year), and leave the analysis and interpretation to each individual analyst. Under such circumstances, any attempt to reach an industry concensus on per-barrel costs through the NPC obviously would be foredoomed to failure. Some published examples of individual analysts' handling of these matters are:

1. "How to Evaluate Current Finding Costs," by R.E. Megill. *World Oil*, May 1960, p. 103.

2. "How to Measure Exploration Profits," by R.E. Megill. *Oil and Gas Journal*, March 18, 1968, p. 126.

3. "The Enigma of Oil and Gas Finding Costs," paper presented at The Eighteenth Annual Conference of Accountants, The University of Tulsa, Tulsa, Oklahoma, April 29, 1964.

Historical costs are useful in determining the trend of overall profitability, but have no relationship to the current exploration activity, which is judged on projected profitability relative to investment--not on historical cost data. Any attempt to use total industry costs to develop an average historical or replacement cost will be virtually meaningless. Those individuals or corporate entities which have tried unsuccessfully to find reserves have left few cost records. Yet their activities have contributed much to later discoveries made by others.

Taxes

Petroleum tax laws are designed to encourage reinvestment. When a company reinvests most of its income in developing more production, its income taxes are relatively low. If the company stops reinvesting in production, it is going out of business and its income taxes will rise sharply. Any attempt to allocate

income taxes to geographical subdivisions or to specific barrels is doomed for many of the reasons already cited on the subject of unit costs, and attempts to estimate per-barrel taxes suffer from the same problems as for other per-barrel costs. Two examples of studies on a "total" or "large sample" basis which might aid in measurement of income tax impact are:

1. Price Waterhouse Study made under the auspices of the Mid-Continent Oil & Gas Association for submission to the Committee on Ways and Means of the United States House of Representatives (June 1969).

2. Study by Petroleum Industry Research Foundation, Inc., entitled "The Tax Burden on the Domestic Oil and Gas Industry" (1964-1966).

The foregoing discussion on the "cost" of finding, developing and producing oil and gas should indicate the difficulty of determining average unit wellhead costs.

Transportation

The cost of transporting crude oil and petroleum products can be more readily defined. These costs vary by the size and type of the facility and the route followed. However, the transportation systems between major producing and consuming areas are well established, and transportation rates are generally available. Major movements involve pipelines, tankers, or a combination of the two. Interstate pipeline tariffs are reported to the Interstate Commerce Commission, and tanker rates are posted.

Two maps are attached showing a sampling of pipeline tariffs for moving crude oil and petroleum products between selected major producing and consuming areas. A sample tariff covering the Colonial Pipeline is also included.

Refining

Refining costs differ widely according to the size, location and complexity of the refinery; the mixture of crude oil and other refinery inputs; and the desired products mix.

There are several sources of refining cost information which can be used to derive meaningful data. Two Department of the Interior publications provide general information: *Refinery and Petrochemical Plant Inputs Released by Interior* (March 17, 1969 news release), and *Petroleum Refineries in the United States and Puerto Rico* (Annual report, January 1 of each year). These reports list the various plants by location and company

ownership and show refinery inputs and capacities for major processing units.

The Census of Manufactures reports a wide range of general statistical data for the petroleum refining industry and all other manufacturing industries. Information is provided on such topics as wages, material-costs, value of shipments, inventories, and capital expenditures. The census classifies these data by area, plant size, product specialization, and ownership.

There are definite problems associated with the analysis of this refinery cost information due to the extensive duplication of materials processed. This problem is brought out in the introduction to *The Census of Manufactures* on page 17 of the 1963 edition:

> "A summation of industry cost of materials figures to industry group totals results in large and unknown amounts of duplication, owing to the addition of costs reported by related industries engaged in successive fabrication stages in the production of finished manufactured products. For this reason, cost-of-materials figures shown at the industry group (2- and 3-digit) and all-industry levels must be used with caution."

Because of this distinct limitation, the information can be used for industry comparisons or trend analyses but not for the determination of finite unit costs.

The American Petroleum Institute published a comprehensive study in June 1967 which investigated the refinery operating costs and investments required to modify the characteristics of present-day gasoline. The study, entitled *U.S. Motor Gasoline Economies, Manufacture of Unleaded Gasoline, Volume I,* was developed by Bonner and Moore Associates, Inc.

Although the study was designed to measure the costs and problems of manufacturing unleaded gasoline, the economic data developed covers much of existing refinery operations for the major areas of the country. The study concluded that 12 composite refinery models were required to provide a meaningful industry cross-section. The model refineries were engineered with respect to facilities and operating cost and were located, sized and weighted in accordance with existing operations. The four geographical regions represented were: the East Coast, the Mid-Continent, the Gulf Coast, and the West Coast.

Complete data are shown for each model refinery on such items as: crude oil costs (including U.S. transportation costs), operating and investment costs, feedstock throughputs, facility configurations, and products produced. This comprehensive and thoroughly documented study clearly demonstrates the wide range of domestic operating conditions and product requirements and could serve as a usable source for specific cost information. Any cost analysis should recognize, however, that labor and material costs have not been static but have accelerated at a rapid rate since the date of the study.

In summation, it is possible to approximate the cost of transporting and refining a particular mixture of crude oils and the cost of transporting petroleum products. However, the basic cost of finding, developing and producing a barrel of crude cannot be determined because of the problems of joint costs between oil and gas as well as the reserve determination and matching those reserves with their associated costs.

There is a basic difference between the historical data sought in Question 20 and the criteria that are generally used by the industry in making major operating decisions. Average historical cost data are used primarily in the evaluation of trends where consistent methodology tends to overcome the data's limitations for developing finite costs. The primary decision criterion in the industry is the economic return *expected* from a specific investment. Therefore, attention is directed forward rather than backward, and considerable effort is expended in predicting these results.

SAMPLE PETROLEUM TRANSPORTATION RATES
FACILITY CODE FOR ATTACHED MAPS

I. Crude Oil Transportation

A. Service Pipeline Company, Wyoming Area to Griffith, Indiana.

B. Service Pipeline Company, Wyoming Area to Wood River, Illinois.

C. Mobil Pipeline Company, Augusta to Kansas City, Kansas.

D. Cities Service Pipeline Company, West Texas to Ponca City, Oklahoma.

E. Service Pipeline Company, West Texas to Whiting, Indiana.

F. Cities Service Pipeline Company, West Texas to Lake Charles, Louisiana.

G. Cities Service Pipeline Company, West Texas to Beaumont, Texas.

H. Texas Pipeline Company, Matagorda County to Houston, Texas.

I. Texas Pipeline Company, Erath, Louisiana to Port Arthur, Texas.

J. Texas Pipeline Company, Terrebonne Parish, Louisiana to Houma, Louisiana.

K. Gulf Pipeline Company, St. James Parish, Louisiana to Wood River, Illinois.

L. Gulf Pipeline Company, St. James Parish, Louisiana to Lockport, Illinois.

M. Various intrastate pipelines, Taft to San Francisco area, California. (Pipeline rate and gathering charge are estimated.)

N. Various intrastate pipelines, Taft to Los Angeles area, California. (Pipeline rate and gathering charge are estimated.)

II. Petroleum Products Transportation

A. Sinclair Pipeline Company, Houston to Kansas City, Missouri.

B. Texas Eastern Transmission Company, Houston to Des Plaines, Illinois.

C. West Shore Pipeline Company, Chicago to Green Bay, Wisconsin.

D. Wolverine Pipeline Company, Hammond, Indiana to Detroit-Toledo.

E. Plantation Pipeline Company, Baytown, Texas to Dulles Airport, Washington, D.C. Intermediate tariffs to:

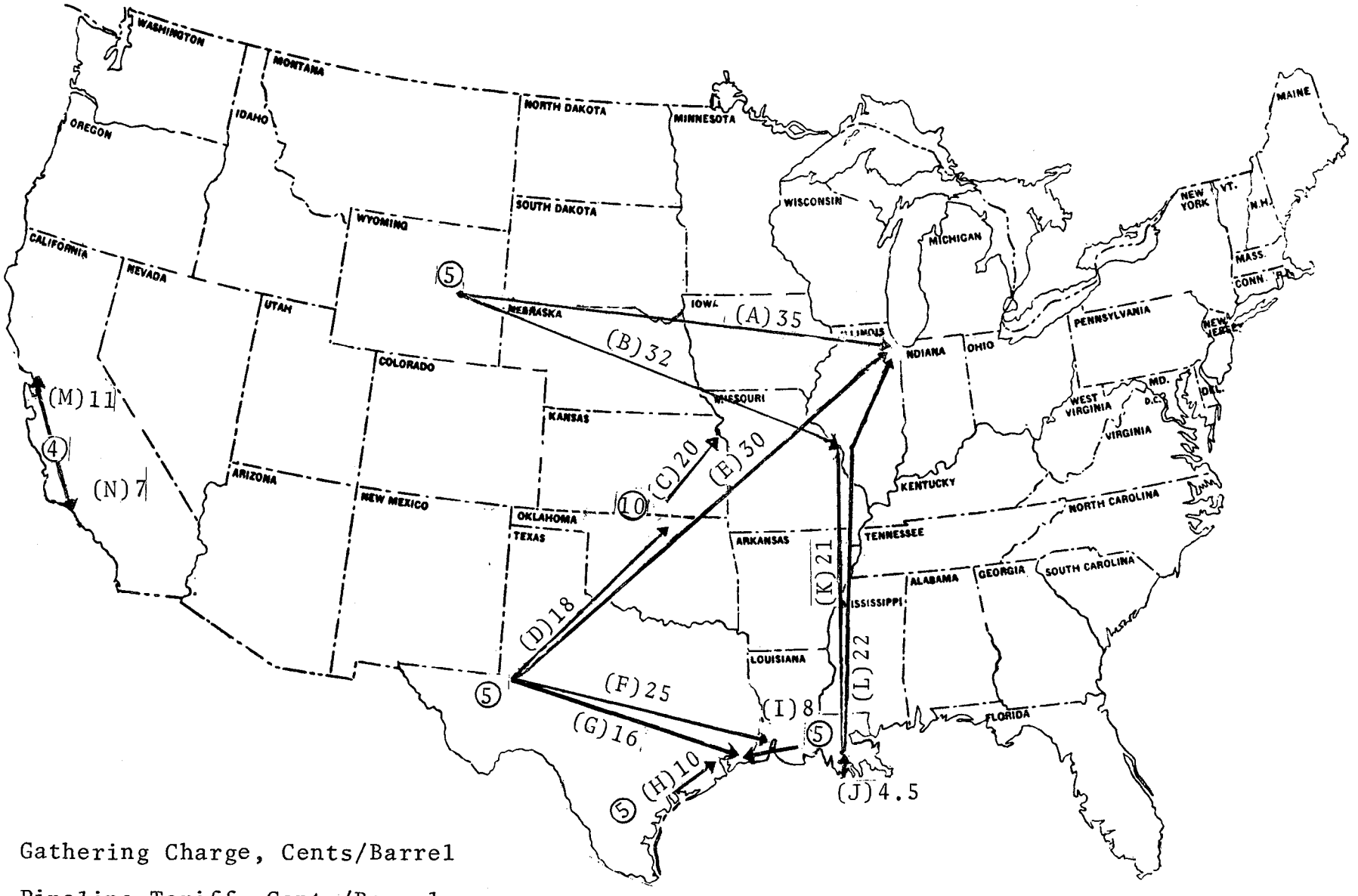
Atlanta, Georgia - 27.7¢/Barrel
Greensboro, North Carolina - 32.5¢/Barrel

F. Colonial Pipeline Company, Pasadena, Texas to Linden, New Jersey. Intermediate tariffs to:

Greensboro, North Carolina - 25.3¢/Barrel
Philadelphia, Pennsylvania - 29.4¢/Barrel

G. Olympic Pipeline Company, Anacortes to Seattle, Washington.

SAMPLE CRUDE OIL TRANSPORTATION RATES
Cents Per Barrel

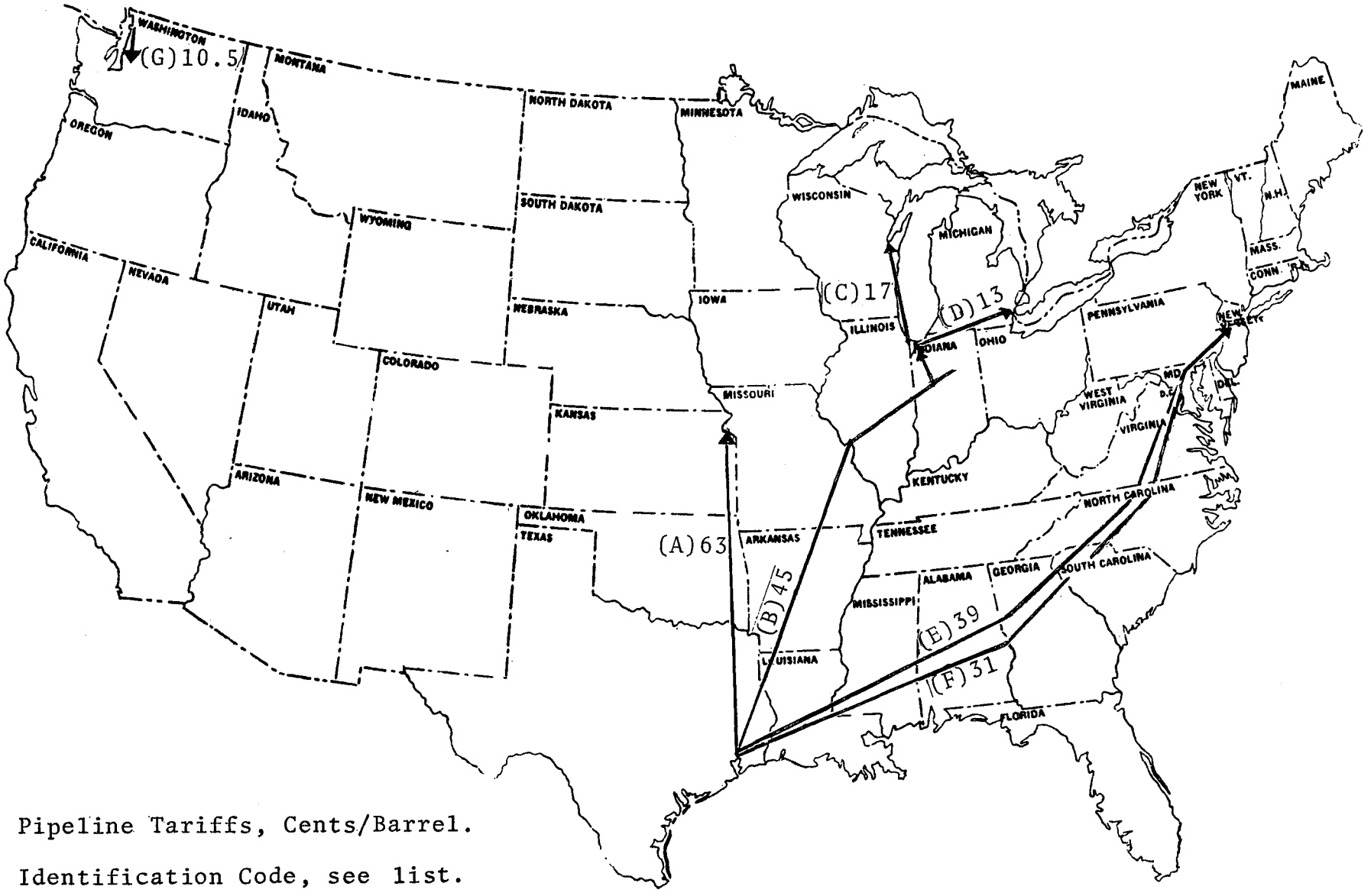


(5) Gathering Charge, Cents/Barrel

20 Pipeline Tariff, Cents/Barrel

(A) Identification Code, see list.

SAMPLE PETROLEUM PRODUCTS TRANSPORTATION RATES
Cents Per Barrel



45 Pipeline Tariffs, Cents/Barrel.

(A) Identification Code, see list.

I.C.C. No. 11
(Cancels I.C.C. No. 10)
(See page 2 for Cancellation)

COLONIAL PIPELINE COMPANY

IN CONNECTION WITH

PLANTATION PIPE LINE COMPANY (FC 4 No. 2)

THE TEXAS PIPE LINE COMPANY (FC 1 No. 1)

LOCAL AND JOINT TARIFF

APPLYING ON

PETROLEUM PRODUCTS

AS DEFINED HEREIN

FROM	TO
Points in Louisiana, Mississippi, and Texas	Points in Alabama, Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, and Virginia.

The rates named in this tariff are for the interstate transportation of petroleum products by pipeline, subject to the rules and regulations published herein.

ISSUED AUGUST 30, 1968

EFFECTIVE OCTOBER 1, 1968
(Except as otherwise provided herein)

ISSUED BY

FRED F. STEINGRABER, President
COLONIAL PIPELINE COMPANY
3390 Peachtree Road Northeast
ATLANTA, GEORGIA (30326)

2077-A (600)

CANCELLATION NOTICE

This tariff cancels I.C.C. No.10 in full. Rates and charges not brought forward herein are hereby cancelled.

TABLE OF CONTENTS

GENERAL APPLICATION

Petroleum products will be transported through carrier's facilities only as provided in these rules and regulations.

RULES AND REGULATIONS

Item No.	Subject	Rules and Regulations
5	Definitions	As used in these rules and regulations, the following terms have the following meanings: "API Gravity" means gravity determined in accordance with ASTM Designation D-287-64 or latest revision thereof. "ASTM Color" means color determined by the ASTM standard method of test ASTM Designation D-1500-64 or latest revision thereof. "Barrel" means 42 United States gallons at 60 degrees Fahrenheit and zero psi gauge. "Batch" means a quantity of petroleum product of like characteristics moved through the pipeline as an identifiable unit. "Segregated Batch" means a batch identifiable as the property of a single shipper, and moved through the pipeline so as to maintain this singular identity and ownership. "Joint Batch" means two or more batches of petroleum product not classified as fungible but moved as one single identifiable unit, and joined by the carrier for movement and identification by order and authority of the participating shippers. Carrier does not prescribe standard specifications for joint batches. "Fungible Batch" means a batch of petroleum product meeting carrier's specifications which may be commingled with other batches of petroleum product meeting the same specifications. "Carrier" means Colonial Pipeline Company and other pipelines participating herein. "Commingled Product" is that mixture which occurs in normal pipeline operations between batches of petroleum products having different specifications. "Consignee" means the party to whom a shipper has ordered the delivery of petroleum product. "Final Delivery" means a delivery of a batch or the remainder thereof so that the batch is completely removed from the pipeline and held in either carrier's tankage or consignee's facilities. "Petroleum Products" means gasolines and petroleum oil distillates as further described in Item 10. "Shipment" means a volume of products offered to and accepted by carrier for transportation. "Shipper" means the party who contracts with the carrier for transportation of petroleum products under the terms of this tariff.
10	Specifications	(a) Petroleum products will not be accepted for transportation hereunder unless such products are free from water and other impurities; have a color not darker than No. 3 ASTM (except that gasolines to which artificial coloring has been added will be accepted for transportation regardless of color); have a vapor pressure not more than 15 pounds absolute at 100 degrees Fahrenheit; have an API gravity at 60 degrees Fahrenheit not less than 30 degrees and not more than 80 degrees; and a viscosity not more than 40 seconds Saybolt Universal at 100 degrees Fahrenheit. (b) Carrier may require the shipper to furnish certified laboratory reports showing the results of tests of the petroleum products offered for transportation. Carrier may also make such tests of the petroleum products as it deems desirable.
15	Minimum Batch	Main Line (a) The minimum quantity of petroleum product which will be accepted, at point of origin by the carrier from one shipper, as a segregated batch shall be 75,000 barrels. (b) The minimum quantity of petroleum product which will be accepted, at points of origin by the carrier from one shipper, for participation in a joint batch shall be 25,000 barrels; provided, however, that the minimum quantity of a joint batch traversing the main line shall be 75,000 barrels. (c) The minimum quantity of petroleum product which will be accepted, at points of origin by the carrier from one shipper, for participation in a fungible batch shall be 25,000 barrels, and will be accepted only when such petroleum product can be combined with other petroleum product from other shippers at the same or other origin points to form a fungible batch of not less than 75,000 barrels. Stub Lines The minimum quantity of petroleum product which will be pumped from carrier's tankage into a stub line as a batch shall be 5,000 barrels.

For explanation of abbreviations and reference marks, see concluding page of this tariff.

RULES AND REGULATIONS		
Item No.	Subject	Rules and Regulations
20	Minimum Delivery at Destination	(a) Deliveries from the main line shall be made in quantities of not less than 5,000 barrels. Deliveries from stub lines and local transfer lines shall be made in quantities of not less than 2,500 barrels. (b) It shall be permissible to split a delivery at one location between two or more consignees, but in no event shall the carrier be obligated to deliver less than 2,500 barrels to any one consignee. (c) A batch contained in the main line shall not be reduced in quantity below 10,000 barrels prior to final delivery. Final delivery of batches on the main line shall be made at Greensboro, North Carolina or at Linden, New Jersey, except as otherwise provided herein. Requests to make final delivery of batches at main line terminals intermediate to Greensboro, North Carolina or Linden, New Jersey shall be granted provided the carrier can make such final delivery without adversely affecting the reasonable operation of carrier's facilities. See Exception in Item 70 with reference to delivery of commingled product.
25	Notice of Intent to Ship; Shipping Schedules	(a) Carrier shall furnish each shipper a copy of carrier's annual schedule calendar and all revisions thereto, which will specify calendar dates on or before which the shipper must give written notice to the carrier of intent to ship petroleum products within the cycle periods assigned to said calendar dates. Unless such notification is made, the carrier shall be under no obligation to accept petroleum products from such shipper. (b) Carrier will prepare and furnish to each shipper schedules showing the estimated time that each shipment will be received for transportation at origin points and the estimated time of arrival at destinations. Such schedules may be modified from time to time to the extent reasonably desirable to facilitate the efficient and economical use and operation of carrier's facilities and to reasonably accommodate shipper's needs for transportation. Carrier will furnish shippers revised schedules when issued. Shipper shall have each shipment available in tankage connected to carrier's origin stations at least eight hours before the scheduled time for receipt by carrier. When a product is not available in tankage within the time limits as aforesaid, acceptance of said product will be at the discretion of the carrier; however, the carrier will endeavor to accept same so long as such acceptance does not adversely affect operation of carrier's facilities.
30	Segregation and Variations in Quality and Gravity	(a) Carrier shall not be liable for variation in gravity or quality of petroleum products occurring while in its custody, resulting from normal pipeline operations, and is under no obligation to deliver the identical petroleum products received. (b) Subject to the foregoing, carrier will, on segregated shipments, to the extent permitted by carrier's facilities, endeavor to make delivery of substantially the same petroleum products at destinations; however, it being impractical to maintain absolute identity of each shipment of petroleum products, reasonable substitution of barrelage of substantially the same specification of petroleum product will be permitted.
35	Origin and Destination Facilities and Disposition of Products on Failure to Accept Delivery	▲ (a) Shipper shall furnish facilities to deliver petroleum products to the carrier's manifold at origin stations at a pumping rate equal to carrier's full line pumping rate or injection rate if applicable and a minimum pressure of 5 psi gauge. (b) No duty to transport will arise until evidence satisfactory to the carrier has been furnished that shipper has provided necessary facilities to which carrier is connected at destination capable of receiving such shipments without delay at pressures and at pumping rates required by carrier, and has made necessary arrangements for accepting delivery of shipments promptly on arrival at destination. (c) In the event carrier has accepted petroleum products for transportation in reliance upon shipper's representations as to acceptance at destination, and there is failure to take such petroleum products at destination as provided in paragraph (b) hereof, then and in such event carrier shall have the right, on 24-hour notice to shipper, to divert, reconsign, or make whatever arrangements for disposition of the petroleum products it deems appropriate to clear its pipeline, including the right to sell the petroleum products at private sale for the best price obtainable. The carrier may be a purchaser at such sale. Out of the proceeds of said sale, carrier may pay itself all transportation charges and other necessary expense of caring for and maintaining the petroleum products and the balance shall be held for whomsoever may be lawfully entitled thereto.

For explanation of abbreviations and reference marks, see concluding page of this tariff.

RULES AND REGULATIONS		
Item No.	Subject	Rules and Regulations
40	Measuring and Volume Correction	Quantities at origin and destination shall be determined by meters or tank gauges. Volumes shall be corrected from observed temperature and pressure to a temperature of 60 degrees Fahrenheit by use of ASTM-IP Table 6 or latest revision thereof, and a pressure of zero psi gauge by use of API Standard 1101 or latest revision thereof. Full deductions will be made for all water and other impurities in products received or delivered. Shippers or consignees shall have the privilege of being present or represented at the times of measuring and testing.
45	Diversion or Reconsignment	Diversion or reconsignment may be made without charge if requested by the shipper at least 48 hours prior to scheduled arrival at original destination, subject to the rates, rules, and regulations applicable from point of origin to point of final destination, upon condition that no out-of-line or backhaul movement will be made.
50	Rates Applicable	Petroleum products transported shall be subject to rates in effect on the date such petroleum products are received by the carrier.
55	Transportation Charges	(a) Transportation charges will be computed and collected at the rates provided herein, on the basis of the number of barrels of petroleum products delivered at destination, after volume corrections as provided for in Item 40. (b) The shipper shall be responsible for payment of transportation and all other charges applicable to the shipment, and, if required, shall prepay such charges or furnish guaranty of payment satisfactory to the carrier. The carrier shall have a lien on all petroleum products accepted for transportation to secure the payment of all charges.
60	Insurance and Liability of Carrier	Except to the extent that loss or damage or delay to petroleum products while in possession of the carrier is covered by insurance provided by carrier, carrier shall not be liable for any such loss or damage or delay caused by the act of God, public enemy, quarantine, authority of law, strikes, riots, nuclear or atomic explosions, floods or act or default of shipper or owner, or any other cause not due to the negligence of carrier whether similar or dissimilar to the causes herein enumerated. Information as to the extent of said insurance coverage is available to shipper at carrier's general office during normal business hours. Any uninsured losses of the kinds herein mentioned will be charged to the shipper or shippers whose product is lost. The carrier will be obligated to deliver only that portion of such petroleum products remaining after deducting shipper's proportion of such losses determined as aforesaid. Transportation charges will be assessed only on the quantity delivered.
65	Title	An offer of petroleum products for shipment shall be deemed a warranty of title by the party offering, but acceptance shall not be deemed a representation by the carrier as to title. The carrier may, in the absence of adequate security, decline to receive any petroleum products which are in litigation, or as to which a dispute over title may exist, or which are encumbered by a lien.

For explanation of abbreviations and reference marks, see concluding page of this tariff.

RULES AND REGULATIONS		
Item No.	Subject	Rules and Regulations
70	Delivery Adjustments	(a) Subject to Item 60 and paragraph (b)(3) of this Item 70, carrier shall account to each shipper for 100 per cent of products received. (b) It is inherent in the operation of a products pipeline that an interface of commingled products will occur between shipments of different products. Carrier will make reasonable effort to hold such commingled interfaces to a minimum by making all deliveries to destinations on the main line (from Houston, Texas, to Linden, New Jersey) and into branch lines at the junction with the main line from products meeting the specifications for delivery at such point, leaving the interfaces in the main line. Carrier does not furnish facilities for storing and reblending commingled interface material and will dispose of such commingled product in the following manner: (1) The interface of commingled products occurring between products having similar basic physical characteristics (compatible interface) shall be divided equally between the shipments which precede and follow the interface. (2) The interface of commingled products occurring in the main line between products having dissimilar basic physical characteristics, which commingled product cannot be readily absorbed into the shipments immediately preceding and following the interface (noncompatible interface), shall be retained in the main line and transported to Linden, New Jersey. The total of such noncompatible interface material transported to Linden in any calendar month will be allocated among the shippers in the proportion that the total number of barrels delivered from the entire system for each shipper bears to the total number of barrels delivered from the entire system for all shippers during that calendar month. The interface material at Linden, New Jersey, will be sold on a bid or contractual basis for the account of the shippers, each shipper to be credited with its proportionate share of the net proceeds of the sale, less transportation charges, and carrier will settle with shipper as provided in paragraph (a) of this Item 70. (3) Where operating conditions warrant, utility tanks will be provided on branch lines for handling noncompatible interfaces occurring between shipments transported through each such line. The interface material will be delivered in kind to the shippers using each branch line, allocated in the proportion that the total number of barrels delivered from such branch line for each shipper bears to the total number of barrels delivered from that branch line for all shippers during the calendar month. Except that where no utility tanks are provided by the carrier on a branch line, the interface material will be delivered into facilities to be provided by the shipper, such deliveries to be in proportion to their respective shipments as nearly as operating conditions will permit. (4) When a shipper tenders product which can neither be blended into nor absorb a blend of at least 5 per cent of other conventional gasolines or distillates, that shipper shall be required either to accept delivery of the additional interface created or pay the costs incurred in its disposition. Exception to Item 20: The provisions of Item 20 with reference to minimum delivery at destination will not apply to deliveries of commingled product as provided in this item.
75	Time Limitation On Claims	As a condition precedent to recovery for loss, damage, or delay to shipments, claims must be filed in writing with the carrier within nine months and one day after delivery of the product, or in case of failure to make delivery, then within nine months and one day after reasonable time for delivery, based on carrier's normal operations, has elapsed; and suits shall be instituted against the carrier only within two years and one day from the day when notice in writing is given by the carrier to the claimant that the carrier has disallowed the claim or any part or parts thereof specified in the notice. Where claims are not filed or suits are not instituted thereon in accordance with the foregoing provisions, carrier hereunder shall not be liable, and such claims will not be paid.
80	Corrosion Inhibitors	Shipper may be required to inject oil soluble corrosion inhibitor, approved by carrier, in the petroleum products to be transported.
85	Proration Of Pipeline Capacity	When the total volume offered for shipment in accordance with Item 25 is greater than can be transported within the period covered by such offers, petroleum products offered by each shipper for transportation will be transported in such quantities and at such times to the limit of carrier's capacity so as to avoid discrimination among shippers.

For explanation of abbreviations and reference marks, see concluding page of this tariff.

TABLE OF RATES

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Beaumont (Jefferson County, Texas)		Route No.	Pasadena (Harris County, Texas)		Route No.
		(a)	(b)		(a)	(b)	
90	State of Alabama						
	Birmingham (Jefferson County)	16.60	18.15	2	18.00	19.70	2
	Montgomery (Montgomery County)	18.85	20.05	2	20.25	21.60	2
	Oxford (Calhoun County)	17.10	19.00	1	18.50	20.55	1
	State of Delaware						
	Marcus Hook (New Castle County)	25.05	27.85	1	26.45	29.40	1
	District of Columbia						
	Washington	23.90	26.55	1	25.30	28.10	1
	State of Georgia						
	Albany-North (Dougherty County)	20.35	22.60	1	21.75	24.15	1
	Albany-South (Dougherty County)	20.35	22.60	1	21.75	24.15	1
	Americus (Sumter County)	20.10	22.35	1	21.50	23.90	1
	Athens (Clarke County)	19.20	21.30	1	20.60	22.85	1
	Atlanta-Chattahoochee (Fulton County)	18.30	20.30	1	19.70	21.85	1
	Atlanta-Doraville (DeKalb County)	18.30	20.30	1	19.70	21.85	1
	Atlanta-Municipal Airport (Clayton County) (1)	33.35	34.70	2	34.75	36.25	2
	Augusta (Richmond County)	20.60	22.85	1	22.00	24.40	1
	Bainbridge (Decatur County)	20.60	23.15	1	22.00	24.70	1
	Columbus (Muscogee County)	22.60	23.50	2	24.00	25.05	2
	Griffin (Spalding County)	18.90	21.00	1	20.30	22.55	1
	Lookout Mountain (Walker County)	19.50	21.65	1	20.90	23.20	1
	Macon-North (Bibb County)	19.50	21.65	1	20.90	23.20	1
	Macon-South (Bibb County)	19.50	21.65	1	20.90	23.90	1
	Rome (Floyd County)	18.75	20.85	1	20.15	22.40	1
	State of Louisiana						
	Baton Rouge (East Baton Rouge Parish)	7.25	7.25	1	9.00	9.00	1
	Opelousas (St. Landry Parish)	6.25	6.25	1	8.00	8.00	1
	State of Maryland						
	Baltimore-Curtis Bay (Baltimore County)	24.40	27.10	1	25.80	28.65	1
	Baltimore-North (Baltimore County)	24.40	27.10	1	25.80	28.65	1
	Baltimore-South (Baltimore County)	24.40	27.10	1	25.80	28.65	1
	Finksburg (Carroll County)	24.40	27.10	1	25.80	28.65	1
	State of Mississippi						
	Collins (Covington County)	10.90	12.15	1	12.30	13.70	1
	Meridian (Lauderdale County)	12.70	14.10	1	14.10	15.65	1

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TABLE OF RATES (Continued)

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Beaumont (Jefferson County, Texas)		Route No.	Pasadena (Harris County, Texas)		Route No.
		(a)	(b)		(a)	(b)	
95	State of New Jersey						
	Bayonne (Hudson County)	26.10	29.00	3	27.50	30.55	3
	Carteret-Christopher Street (Middlesex County)	26.10	29.00	1	27.50	30.55	1
	Carteret-Roosevelt Avenue (Middlesex County)	26.10	29.00	1	27.50	30.55	1
	Eagle Point (Gloucester County)	25.10	27.85	1	26.50	29.40	1
	Elizabeth-Front Street (Union County)	26.10	29.00	1	27.50	30.55	1
	Gloucester (Camden County)	25.10	27.85	1	26.50	29.40	1
	Linden-Buckeye (Union County)	26.10	29.00	1	27.50	30.55	1
	Linden-Marshes Rd. East (Union County)	26.10	29.00	1	27.50	30.55	1
	Linden-Marshes Rd. West (Union County)	26.10	29.00	1	27.50	30.55	1
	Linden-Tremley Point (Union County)	26.10	29.00	1	27.50	30.55	1
	Linden-Tremley Road (Union County)	26.10	29.00	1	27.50	30.55	1
	Newark-Delancey Street (Essex County)	26.10	29.00	1	27.50	30.55	1
	Newark-Paragon (Essex County)	26.10	29.00	1	27.50	30.55	1
	Newark-Port Newark (Essex County)	26.10	29.00	1	27.50	30.55	1
	Paulsboro (Gloucester County)	25.10	27.85	1	26.50	29.40	1
	Pennsauken (Camden County)	25.10	27.85	1	26.50	29.40	1
	Petty Island (Camden County)	25.10	27.85	1	26.50	29.40	1
	Port Reading-Smith Creek (Middlesex County)	26.10	29.00	1	27.50	30.55	1
	Trenton (Mercer County)	25.40	28.20	1	26.80	29.75	1
	State of New York						
	Gulfport (Richmond County)	26.10	29.00	1	27.50	30.55	1
	Port Mobil (Richmond County)	26.10	29.00	1	27.50	30.55	1
	State of North Carolina						
	Apex (Wake County)	22.70	25.25	1	24.10	26.80	1
	Charlotte (Mecklenburg County)	20.70	23.05	1	22.10	24.60	1
	Fayetteville (Cumberland County)	23.10	25.65	1	24.50	27.20	1
	Greensboro (Guilford County)	21.40	23.75	1	22.80	25.30	1
	Selma (Johnston County)	23.10	25.65	1	24.50	27.20	1
	State of Pennsylvania						
	Booth (Delaware County)	25.10	27.85	1	26.50	29.40	1
	Philadelphia-Girard Point (Philadelphia County)	25.10	27.85	1	26.50	29.40	1
	Philadelphia-Point Breeze (Philadelphia County)	25.10	27.85	1	26.50	29.40	1
	Philadelphia-49th Street (Philadelphia County)	25.10	27.85	1	26.50	29.40	1

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Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Beaumont (Jefferson County, Texas)		Route No.	Pasadena (Harris County, Texas)		Route No.
		(a)	(b)		(a)	(b)	
	State of South Carolina						
	Augusta-North (Aiken County)	20.60	22.85	1	22.00	24.40	1
	Belton (Anderson County)	19.80	22.00	1	21.20	23.55	1
	Spartanburg (Spartanburg County)	20.25	22.50	1	21.65	24.05	1
	State of Tennessee						
	Chattanooga (Hamilton County)	19.50	21.65	1	20.90	23.20	1
	Knoxville (Knox County)	20.35	22.60	1	21.75	24.15	1
	Knoxville-East (Knox County)	20.35	22.60	1	21.75	24.15	1
	Nashville-Davidson Street (Davidson County)	20.60	22.85	1	22.00	24.40	1
	Nashville-Hydes Ferry Road (Davidson County)	20.60	22.85	1	22.00	24.40	1
	Nashville-Wharf Avenue (Davidson County)	20.60	22.85	1	22.00	24.40	1
	Nashville-51st Avenue N. (Davidson County)	20.60	22.85	1	22.00	24.40	1
	Nashville-56th Avenue N. (Davidson County)	20.60	22.85	1	22.00	24.40	1
100	Nashville-63rd Avenue N. (Davidson County)	20.60	22.85	1	22.00	24.40	1
	State of Virginia						
	Bull Run (Prince William County)	23.90	26.55	1	25.30	28.10	1
	Dulles Airport (Fairfax County) (2)	25.90	28.75	1	27.30	30.30	1
	Fairfax (Fairfax County)	23.90	26.55	1	25.30	28.10	1
	Fredericksburg (Spotsylvania County) (3)	26.40	28.00	4	27.80	29.55	4
	Norfolk-Barnes Road (City of Chesapeake)	23.60	26.20	1	25.00	27.75	1
	Norfolk-Hill Street (City of Chesapeake)	23.60	26.20	1	25.00	27.75	1
	Norfolk-U.S. Highway 460 (City of Chesapeake)	23.60	26.20	1	25.00	27.75	1
	Richmond-Interchange No. 9 (City of Richmond)	22.80	25.30	1	24.20	26.85	1
	Richmond-Interchange No. 7 (Chesterfield County)	22.80	25.30	1	24.20	26.85	1
	Richmond-Interchange No. 8 (City of Richmond)	22.80	25.30	1	24.20	26.85	1
	Roanoke (Bedford County)	22.95	25.50	1	24.35	27.05	1
	Yorktown (York County)	23.60	26.20	1	25.00	27.75	1

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TABLE OF RATES (Continued)

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Port Arthur (Jefferson County, Texas)		Route No.	Collins (4) (Covington County, Mississippi)		Route No.
		(a)	(b)		(a)	(b)	
105	State of Alabama						
	Birmingham (Jefferson County)	16.60	18.15	2	12.05	13.10	2
	Montgomery (Montgomery County)	18.85	20.05	2	14.30	15.00	2
	Oxford (Calhoun County)	17.10	19.00	1	12.55	13.95	1
	State of Delaware						
	Marcus Hook (New Castle County)	25.05	27.85	1	20.50	22.80	1
	District of Columbia						
	Washington	23.90	26.55	1	19.35	21.05	1
	State of Georgia						
	Albany-North (Dougherty County)	20.35	22.60	1	15.80	17.55	1
	Albany-South (Dougherty County)	20.35	22.60	1	15.80	17.55	1
	Americus (Sumter County)	20.10	22.35	1	15.55	17.30	1
	Athens (Clarke County)	19.20	21.30	1	14.65	16.25	1
	Atlanta-Chattahoochee (Fulton County)	18.30	20.30	1	13.75	15.25	1
	Atlanta-Doraville (DeKalb County)	18.30	20.30	1	13.75	15.25	1
	Atlanta-Municipal Airport (Clayton County) (1)	33.35	34.70	2	28.80	29.65	2
	Augusta (Richmond County)	20.60	22.85	1	16.05	17.80	1
	Bainbridge (Decatur County)	20.60	23.15	1	16.05	18.10	1
	Columbus (Muscogee County)	22.60	23.50	2	18.05	18.45	2
	Griffin (Spalding County)	18.90	21.00	1	14.35	15.95	1
	Lookout Mountain (Walker County)	19.50	21.65	1	14.95	16.60	1
	Macon-North (Bibb County)	19.50	21.65	1	14.95	16.60	1
	Macon-South (Bibb County)	19.50	21.65	1	14.95	16.60	1
	Rome (Floyd County)	18.75	20.85	1	14.20	15.80	1
	State of Louisiana						
	Baton Rouge (East Baton Rouge Parish)	7.25	7.25	1	...	...	...
	Opelousas (St. Landry Parish)	6.25	6.25	1	...	...	...
	State of Maryland						
	Baltimore-Curtis Bay (Baltimore County)	24.40	27.10	1	19.85	22.05	1
	Baltimore-North (Baltimore County)	24.40	27.10	1	19.85	22.05	1
	Baltimore-South (Baltimore County)	24.40	27.10	1	19.85	22.05	1
	Finksburg (Carroll County)	24.40	27.10	1	19.85	22.05	1
	State of Mississippi						
	Collins (Covington County)	10.90	12.15	1	...	...	...
	Meridian (Lauderdale County)	12.70	14.10	1	...	...	...

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TABLE OF RATES (Continued)

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Port Arthur (Jefferson County, Texas)		Route No.	Collins (4) (Covington County, Mississippi)		Route No.
		(a)	(b)		(a)	(b)	
	State of New Jersey						
	Bayonne (Hudson County)	26.10	29.00	3	21.55	23.95	3
	Carteret-Christopher Street (Middlesex County)	26.10	29.00	1	21.55	23.95	1
	Carteret-Roosevelt Avenue (Middlesex County)	26.10	29.00	1	21.55	23.95	1
	Eagle Point (Gloucester County)	25.10	27.85	1	20.55	22.80	1
	Elizabeth-Front Street (Union County)	26.10	29.00	1	21.55	23.95	1
	Gloucester (Camden County)	25.10	27.85	1	20.55	22.80	1
	Linden-Buckeye (Union County)	26.10	29.00	1	21.55	23.95	1
	Linden-Marshes Rd. East (Union County)	26.10	29.00	1	21.55	23.95	1
	Linden-Marshes Rd. West (Union County)	26.10	29.00	1	21.55	23.95	1
	Linden-Tremley Point (Union County)	26.10	29.00	1	21.55	23.95	1
	Linden-Tremley Road (Union County)	26.10	29.00	1	21.55	23.95	1
	Newark-Delancey Street (Essex County)	26.10	29.00	1	21.55	23.95	1
	Newark-Paragon (Essex County)	26.10	29.00	1	21.55	23.95	1
	Newark-Port Newark (Essex County)	26.10	29.00	1	21.55	23.95	1
	Paulsboro (Gloucester County)	25.10	27.85	1	20.55	22.80	1
	Pennsauken (Camden County)	25.10	27.85	1	20.55	22.80	1
110	Petty Island (Camden County)	25.10	27.85	1	20.55	22.80	1
	Port Reading-Smith Creek (Middlesex County)	26.10	29.00	1	21.55	23.95	1
	Trenton (Mercer County)	25.40	28.20	1	20.85	23.15	1
	State of New York						
	Gulfport (Richmond County)	26.10	29.00	1	21.55	23.95	1
	Port Mobil (Richmond County)	26.10	29.00	1	21.55	23.95	1
	State of North Carolina						
	Apex (Wake County)	22.70	25.25	1	18.15	20.20	1
	Charlotte (Mecklenburg County)	20.70	23.05	1	16.15	18.00	1
	Fayetteville (Cumberland County)	23.10	25.65	1	18.55	20.60	1
	Greensboro (Guilford County)	21.40	23.75	1	16.85	18.70	1
	Selma (Johnston County)	23.10	25.65	1	18.55	20.60	1
	State of Pennsylvania						
	Booth (Delaware County)	25.10	27.85	1	20.55	22.80	1
	Philadelphia-Girard Point (Philadelphia County)	25.10	27.85	1	20.55	22.80	1
	Philadelphia-Point Breeze (Philadelphia County)	25.10	27.85	1	20.55	22.80	1
	Philadelphia-49th Street (Philadelphia County)	25.10	27.85	1	20.55	22.80	1

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Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Port Arthur (Jefferson County, Texas)		Route No.	Collins (4) (Covington County, Mississippi)		Route No.
		(a)	(b)		(a)	(b)	
115	State of South Carolina						
	Augusta-North (Aiken County)	20.60	22.85	1	16.05	17.80	1
	Belton (Anderson County)	19.80	22.00	1	15.25	16.95	1
	Spartanburg (Spartanburg County)	20.25	22.50	1	15.70	17.45	1
	State of Tennessee						
	Chattanooga (Hamilton County)	19.50	21.65	1	14.95	16.60	1
	Knoxville (Knox County)	20.35	22.60	1	15.80	17.55	1
	Knoxville-East (Knox County)	20.35	22.60	1	15.80	17.55	1
	Nashville-Davidson Street (Davidson County)	20.60	22.85	1	16.05	17.80	1
	Nashville-Hydes Ferry Road (Davidson County)	20.60	22.85	1	16.05	17.80	1
	Nashville-Wharf Avenue (Davidson County)	20.60	22.85	1	16.05	17.80	1
	Nashville-51st Avenue N. (Davidson County)	20.60	22.85	1	16.05	17.80	1
	Nashville-56th Avenue N. (Davidson County)	20.60	22.85	1	16.05	17.80	1
	Nashville-63rd Avenue N. (Davidson County)	20.60	22.85	1	16.05	17.80	1
	State of Virginia						
	Bull Run (Prince William County)	23.90	26.55	1	19.35	21.50	1
	Dulles Airport (Fairfax County) (2)	25.90	28.75	1	21.35	23.70	1
	Fairfax (Fairfax County)	23.90	26.55	1	19.35	21.50	1
	Fredericksburg (Spotsylvania County) (3)	26.40	28.00	4	21.85	22.95	4
	Norfolk-Barnes Road (City of Chesapeake)	23.60	26.20	1	19.05	21.15	1
	Norfolk-Hill Street (City of Chesapeake)	23.60	26.20	1	19.05	21.15	1
	Norfolk-U.S. Highway 460 (City of Chesapeake)	23.60	26.20	1	19.05	21.15	1
	Richmond-Interchange No. 9 (City of Richmond)	22.80	25.30	1	18.25	20.25	1
	Richmond-Interchange No. 7 (Chesterfield County)	22.80	25.30	1	18.25	20.25	1
	Richmond-Interchange No. 8 (City of Richmond)	22.80	25.30	1	18.25	20.25	1
	Roanoke (Bedford County)	22.95	25.50	1	18.40	20.45	1
	Yorktown (York County)	23.60	26.20	1	19.05	21.15	1

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Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Convent (5) (St. James Parish, Louisiana)		Route No.	Lake Charles (Calcasieu Parish, Louisiana)		Route No.
		(a)	(b)		(a)	(b)	
	State of Alabama						
	Birmingham (Jefferson County)	17.85	19.10	6	16.20	17.70	2
	Montgomery (Montgomery County)	20.10	21.00	6	18.45	19.60	2
	Oxford (Calhoun County)	18.35	19.95	5	16.70	18.55	1
	State of Delaware						
	Marcus Hook (New Castle County)	26.30	28.80	5	24.65	27.40	1
	District of Columbia						
	Washington	25.15	27.50	5	23.50	26.10	1
	State of Georgia						
	Albany-North (Dougherty County)	21.60	23.55	5	19.95	22.15	1
	Albany-South (Dougherty County)	21.60	23.55	5	19.95	22.15	1
	Americus (Sumter County)	21.35	23.30	5	19.70	21.90	1
	Athens (Clarke County)	20.45	22.25	5	18.80	20.85	1
	Atlanta-Chattahoochee (Fulton County)	19.55	21.25	5	17.90	19.85	1
	Atlanta-Doraville (DeKalb County)	19.55	21.25	5	17.90	19.85	1
	Atlanta-Municipal Airport (Clayton County) (1)	34.60	35.65	6	32.95	34.25	2
	Augusta (Richmond County)	21.85	23.80	5	20.20	22.40	1
120	Bainbridge (Decatur County)	21.85	24.10	5	20.20	22.70	1
	Columbus (Muscogee County)	23.85	24.45	6	22.20	23.05	2
	Griffin (Spalding County)	20.15	21.95	5	18.50	20.55	1
	Lookout Mountain (Walker County)	20.75	22.60	5	19.10	21.20	1
	Macon-North (Bibb County)	20.75	22.60	5	19.10	21.20	1
	Macon-South (Bibb County)	20.75	22.60	5	19.10	21.20	1
	Rome (Floyd County)	20.00	21.80	5	18.35	20.40	1
	State of Louisiana						
	Baton Rouge (East Baton Rouge Parish)	...	...	...	...	...	...
	Opelousas (St. Landry Parish)	...	...	...	...	...	...
	State of Maryland						
	Baltimore-Curtis Bay (Baltimore County)	25.65	28.05	5	24.00	26.65	1
	Baltimore-North (Baltimore County)	25.65	28.05	5	24.00	26.65	1
	Baltimore-South (Baltimore County)	25.65	28.05	5	24.00	26.65	1
	Finksburg (Carroll County)	25.65	28.05	5	24.00	26.65	1
	State of Mississippi						
	Collins (Covington County)	12.15	13.10	5	10.50	11.70	1
	Meridian (Lauderdale County)	13.95	15.05	5	12.30	13.65	1

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(b) - Effective May 1, 1969, unless soomer cancelled, changed or postponed.
For explanation of abbreviations and other reference marks, see concluding page of this tariff.

TABLE OF RATES (Continued)

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons — Points of Origin: Convent (5) (St. James Parish, Louisiana) (a)	Convent (5) (St. James Parish, Louisiana) (b)	Route No.	Lake Charles (Calcasieu Parish, Louisiana) (a)	Lake Charles (Calcasieu Parish, Louisiana) (b)	Route No.
	State of New Jersey						
	Bayonne (Hudson County)	27.35	29.95	7	25.70	28.55	3
	Carteret-Christopher Street (Middlesex County)	27.35	29.95	5	25.70	28.55	1
	Carteret-Roosevelt Avenue (Middlesex County)	27.35	29.95	5	25.70	28.55	1
	Eagle Point (Gloucester County)	26.35	28.80	5	24.70	27.40	1
	Elizabeth-Front Street (Union County)	27.35	29.95	5	25.70	28.55	1
	Gloucester (Camden County)	26.35	28.80	5	24.70	27.40	1
	Linden-Buckeye (Union County)	27.35	29.95	5	25.70	28.55	1
	Linden-Marshes Rd. East (Union County)	27.35	29.95	5	25.70	28.55	1
	Linden-Marshes Rd. West (Union County)	27.35	29.95	5	25.70	28.55	1
	Linden-Tremley Point (Union County)	27.35	29.95	5	25.70	28.55	1
	Linden-Tremley Road (Union County)	27.35	29.95	5	25.70	28.55	1
	Newark-Delancey Street (Essex County)	27.35	29.95	5	25.70	28.55	1
	Newark-Paragon (Essex County)	27.35	29.95	5	25.70	28.55	1
	Newark-Port Newark (Essex County)	27.35	29.95	5	25.70	28.55	1
125	Paulsboro (Gloucester County)	26.35	28.80	5	24.70	27.40	1
	Pennsauken (Camden County)	26.35	28.80	5	24.70	27.40	1
	Petty Island (Camden County)	26.35	28.80	5	24.70	27.40	1
	Port Reading-Smith Creek (Middlesex County)	27.35	29.95	5	25.70	28.55	1
	Trenton (Mercer County)	26.65	29.15	5	25.00	27.75	1
	State of New York						
	Gulfport (Richmond County)	27.35	29.95	5	25.70	28.55	1
	Port Mobil (Richmond County)	27.35	29.95	5	25.70	28.55	1
	State of North Carolina						
	Apex (Wake County)	23.95	26.20	5	22.30	24.80	1
	Charlotte (Mecklenburg County)	21.95	24.00	5	20.30	22.60	1
	Fayetteville (Cumberland County)	24.35	26.60	5	22.70	25.20	1
	Greensboro (Guilford County)	22.65	24.70	5	21.00	23.30	1
	Selma (Johnston County)	24.35	26.60	5	22.70	25.20	1
	State of Pennsylvania						
	Booth (Delaware County)	26.35	28.80	5	24.70	27.40	1
	Philadelphia-Girard Point (Philadelphia County)	26.35	28.80	5	24.70	27.40	1
	Philadelphia-Point Breeze (Philadelphia County)	26.35	28.80	5	24.70	27.40	1
	Philadelphia-49th Street (Philadelphia County)	26.35	28.80	5	24.70	27.40	1

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TABLE OF RATES (Concluded)

Item No.	Destinations	Rates in Cents Per Barrel of 42 United States Gallons					
		Points of Origin					
		Convent (5) (St. James Parish, Louisiana)		Route No.	Lake Charles (Calcasieu Parish, Louisiana)		Route No.
		(a)	(b)		(a)	(b)	
130	State of South Carolina						
	Augusta-North (Aiken County)	21.85	23.80	5	20.20	22.40	1
	Belton (Anderson County)	21.05	22.95	5	19.40	21.55	1
	Spartanburg (Spartanburg County)	21.50	23.45	5	19.85	22.05	1
	State of Tennessee						
	Chattanooga (Hamilton County)	20.75	22.60	5	19.10	21.20	1
	Knoxville (Knox County)	21.60	23.55	5	19.95	22.15	1
	Knoxville-East (Knox County)	21.60	23.55	5	19.95	22.15	1
	Nashville-Davidson Street (Davidson County)	21.85	23.80	5	20.20	22.40	1
	Nashville-Hydes Ferry Road (Davidson County)	21.85	23.80	5	20.20	22.40	1
	Nashville-Wharf Avenue (Davidson County)	21.85	23.80	5	20.20	22.40	1
	Nashville-51st Avenue N. (Davidson County)	21.85	23.80	5	20.20	22.40	1
	Nashville-56th Avenue N. (Davidson County)	21.85	23.80	5	20.20	22.40	1
	Nashville-63rd Avenue N. (Davidson County)	21.85	23.80	5	20.20	22.40	1
	State of Virginia						
	Bull Run (Prince William County)	25.15	27.50	5	23.50	26.10	1
	Dulles Airport (Fairfax County) (2)	27.15	29.70	5	25.50	28.30	1
	Fairfax (Fairfax County)	25.15	27.50	5	23.50	26.10	1
	Fredericksburg (Spotsylvania County)(3)	27.65	28.95	8	26.00	27.55	4
	Norfolk-Barnes Road (City of Chesapeake)	24.85	27.15	5	23.20	25.75	1
	Norfolk-Hill Street (City of Chesapeake)	24.85	27.15	5	23.20	25.75	1
	Norfolk-U.S. Highway 460 (City of Chesapeake)	24.85	27.15	5	23.20	25.75	1
	Richmond-Interchange No. 9 (City of Richmond)	24.05	26.25	5	22.40	24.85	1
	Richmond-Interchange No. 7 (Chesterfield County)	24.05	26.25	5	22.40	24.85	1
	Richmond-Interchange No. 8 (City of Richmond)	24.05	26.25	5	22.40	24.85	1
	Roanoke (Bedford County)	24.20	26.45	5	22.55	25.05	1
	Yorktown (York County)	24.85	27.15	5	23.20	25.75	1

▲ (1) Limited to movement of commercial turbine engine fuel.
▲ (2) Shippers shall provide tankage at Fairfax for Dulles deliveries.
▲ (3) Limited to movement of petroleum oil distillates.
▲ (4) Carrier facilities not available for full stream receipts.
▲ (5) Shipper shall provide tankage at Baton Rouge, Louisiana, for all shipments originating at Convent, Louisiana.

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(b) - Effective May 1, 1969, unless sooner cancelled, changed or postponed.
For explanation of abbreviations and other reference marks, see concluding page of this tariff.

ROUTING INSTRUCTIONS

Rates named herein apply only via the following routes:

1. Colonial Pipeline Company direct.
2. Colonial Pipeline Company (Helena, Alabama, Junction), Plantation Pipe Line Company.
3. Colonial Pipeline Company (Gulfport, New York, Junction), The Texas Pipe Line Company.
4. Colonial Pipeline Company (Greensboro, North Carolina, Junction), Plantation Pipe Line Company.
5. The Texas Pipe Line Company (Baton Rouge, Louisiana, Junction), Colonial Pipeline Company.
6. The Texas Pipe Line Company (Baton Rouge, Louisiana, Junction), Colonial Pipeline Company (Helena, Alabama, Junction), Plantation Pipe Line Company.
7. The Texas Pipe Line Company (Baton Rouge, Louisiana, Junction), Colonial Pipeline Company (Gulfport, New York, Junction), The Texas Pipe Line Company.
8. The Texas Pipe Line Company (Baton Rouge, Louisiana, Junction), Colonial Pipeline Company (Greensboro, North Carolina, Junction), Plantation Pipe Line Company.

EXPLANATION OF ABBREVIATIONS

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
I.C.C.	Interstate Commerce Commission
No.	Number
psi	Pounds per square inch

EXPLANATION OF REFERENCE MARKS

▲ - Changes in wording which result in neither increases nor reductions in charges.

CHAPTER EIGHT

Question No. 21

Price and Productive Capacity

21. Taking account of what is known about the array of costs of production from the most efficient (lowest cost) pools to the least efficient, what would be the annual volume of oil produced in the United States in the immediate future at the following average wellhead prices (assume that each pool is restricted only to its maximum efficient rate of production (MER) and that producers expect both the market price and money costs of labor and equipment to remain the same for an extended period of 10 years or so).

Per Barrel	
$10.00	*$3.00*
5.00	*2.50*
4.00	*2.00*
3.50	*1.50*

What would be the effect of these prices on available supply over time? Would the expected annual production at that price remain constant for the next 5 or 10 years, or would it increase or decrease and if so by how much, i.e., along what path?

(If estimates of production from North Alaska are made, they should be given separately and not mingled with the rest.

Although considerable data are being gathered from the industry, (i.e., Bureau of the Census, Joint Association Survey, American Petroleum Institute) none overcomes the problem of allocating joint oil and gas costs or the problem of uniform cost definition. These inadequacies preclude establishment of reliable unit costs. Sufficient data are not available to define with reasonable precision the array of existing production costs.

The producing capacity of all fields in the United States as of January 1, 1969, has been estimated by the American Petroleum Institute and the Independent Petroleum Association of America under slightly different assumptions. These data are published. They do not represent deliverability. However, a study of United States deliverability by an NPC committee is under way at the present time.

The relationship between crude oil prices and the levels of production, exploration and development activity is also too variable to permit detailed analysis of the effects of incremental crude price changes. Shortages of crude oil and a

simultaneous or subsequent rise in prices, as well as increased per-well allowables during times of shortage, cause an increase in exploratory activity. However, the time-lag involved and complexity of the industry itself make the analysis of this reaction difficult if not impossible. In addition, the pressures caused by changing product prices produce different results from changing crude prices and cause different reactions in companies depending on their degree of integration and balance. The expected time-length of the shortage and the general political/economic climate at the time of the change are also important factors to each entity involved. In some cases, this is further compounded by misreading the symptoms, overreacting and subsequently depressing demand and, ultimately, prices. A reasonably stable climate is desirable in the petroleum industry just as it is in any other.

Despite the difficulties which are inherent in responding to this question as framed, it is possible to draw certain general conclusions on the effects of substantial changes in crude price in either direction. Such conclusions, however drawn, must be predicated on a direct change from existing crude prices without an intervening period of higher or lower prices. Such a change could create a radically different industry. The recognition that even fairly current historical data are of questionable value is embodied in the fact that investment decisions in the industry are usually based on projections, whereas historical data are used to observe trends over time.

Any precipitous price change caused by removal of import controls will produce side effects which may eventually exceed the more apparent and immediate direct effects.

Lower Than Existing Price Levels

A substantial increase in the level of imports probably would cause a significant reduction in current crude price levels. The removal of controls almost surely would do so. Various statements have been issued predicting that domestic price drops occasioned by free competition with foreign crude would negate the ability of the United States to supply even 50 percent of its demand for crude by 1980. These include: testimony by M. A. Wright of Humble Oil and Refining Company before the Subcommittee of Antitrust and Monopoly of the Judiciary Committee, United States Senate; the Independent Petroleum Association of America's response to Question 18 of the Cabinet Task Force inquiry into the Import Program; and the data furnished on January 16, 1969, by the Office of Oil and Gas in response to Senator Proxmire's inquiry.

Furthermore, there is a limit to the extent to which excess capacity in the United States could be used in the short term to offset losses from abandonment of marginal wells during the enforced liquidation caused by greatly lowered prices. The April 28, 1969, issue of the *Oil and Gas Journal*, recent Independent Petroleum Association of America estimates and the testimony of Mr. Wright confirm this.

Higher Than Existing Price Levels

Significantly higher crude oil prices probably would have different effects with each substantial increment of increase. The first increase might postpone abandonment of wells already at or near the economic limit and spur conventional exploration. The next substantial increase might see more of the costly exotic reservoir recovery mechanisms come into play and increase the .5 percent annual increase in average percentage of proved reserves recoverable.[1] This effect would take several years to realize. Crude oil prices very much above four dollars per barrel are unlikely, because at some price--not yet determined--synthetic oil and gas, coal gas, etc. will become competitive on a very large scale and drastically limit further price increases.

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[1] NPC, *Impact of New Technology on the U. S. Petroleum Industry, 1946-1965*, December 1967.

CHAPTER NINE

Question No. 22

Distribution of Production Costs

22. Under existing production controls and prorationing systems, what is the array of wellhead costs of oil in the United States, from marginal wells to the most efficient pools? Can you estimate how much oil is produced under high-cost, median-cost, and low-cost conditions this year, indicating your own measures of these cost brackets? If your organization produces oil, how is that production distributed among these cost categories?

Insufficient data are available to determine a meaningful array of wellhead costs. The term "wellhead cost" needs further clarification. Does it consist of current direct producing cost only or does it also include overhead cost allocations, sunk exploration and development expenditures, capital costs, or profits?

The average direct cost of producing oil and gas for the total United States can be estimated. Table I develops these cost figures for the period 1962 through 1966. As indicated, the average direct cost paid by operators in 1966 to produce a dollar of wellhead value for *both oil and gas* was $0.254 (based on 1/8 royalty) and $0.266 (based on 1/6 royalty). These costs were developed with the two most common royalty rates, because specific royalty data were not available. No attempt was made to distinguish between the cost of producing oil and the cost of producing natural gas, since there is no generally accepted method. These costs cover direct producing expenditures only and do not include allowances for income taxes, finding and developing expenditures, amortizations, capital costs, general overhead, or profits. Consequently, these direct producing costs represent only a portion of the total cost required to find, develop and produce oil and gas.

The size of the upper portion of the requested cost array in Question 22 can be estimated from the *National Stripper Well Survey* published by the Interstate Oil Compact Commission. Table II presents stripper well data for 1967. The stripper well category includes wells which produce less than 10 barrels per day of primary oil. As indicated, there were 376,851 wells in this category (65.7 percent of total U.S. wells) which accounted for a total of 500 million barrels of production during 1967 (15.5 percent of U.S. total production). These wells accounted for 6.2 billion barrels of proved plus indicated additional reserves (16.0 percent of total U.S. proved plus indicated reserves). The indicated additional category includes additional recoveries in known reservoirs (in excess of the proved reserves) which engineering knowledge and judgment indicate

will be economically available by application of fluid injection. This information is presented by states to show the wide geographical variation in stripper well concentration. The table also indicates the extent of the impact of reduced prices on those geographical areas with a large volume of stripper production. A substantial decrease in prices would probably drastically reduce the size of the producing industry in many of these states.

The range of U.S. production costs can be surmised from the range of average producing volumes per well for the various states. Table III presents these data for 1967. The states are ranked in order of increasing average daily producing volumes. As indicated, 15.0 percent of U.S. production came from states where the average daily production per well was less than 10 barrels. Approximately 50 percent of U.S. production was produced in states with average daily production rates of less than 16 barrels per well. The average daily producing rate during 1967 for the whole United States was 15.2 barrels per well. Texas represents 34.8 percent of the total, so it is further subdivided into major producing areas.

This cost and cost-related information should be considered with caution. There are certain hazards in categorizing producing oil wells for analytical purposes, since producing volumes and costs form a continuum and do not fall into clearly defined groupings. The use of state averages tends to depress the wide swings in volume that exist within each state. These figures, however, can serve as geographical indices of producing levels. The relationship of producing cost to volume varies with the operating conditions prevailing in each area. Nevertheless, the wide variation in average producing volumes is indicative of the wide spread that exists in producing costs.

TABLE I

ESTIMATED DIRECT PRODUCTION COSTS (a)

		1962	1963	1964	1965	1966
A.	Wellhead Value ($Million)					
	1. Crude Oil (b)	7,774	7,966	8,017	8,158	8,726
	2. Natural Gas (b)	2,145	2,328	2,388	2,495	2,703
	3. Total	9,919	10,294	10,405	10,653	11,429
B.	Direct Production Costs (c) ($Million)					
	1. Producing Costs (d)	1,535	1,581	1,613	1,685	1,895
	2. Production Taxes	354	373	393	400	430
	3. Ad Valorem Taxes	202	198	204	212	212
	4. Total	2,091	2,152	2,210	2,297	2,537
C.	Direct Prod. Cost (as a percent of Wellhead Value for Both Oil and Gas) (e)	21.1%	20.9%	21.2%	21.6%	22.2%
D.	Direct Cost Paid by Operator (as a percent of Wellhead Value Received after 1/8 Royalty) (f)	24.1%	23.9%	24.2%	24.7%	25.4%
E.	Direct Cost Paid by Operator (as a percent of Wellhead Value Received after 1/6 Royalty) (g)	25.3%	25.1%	25.4%	25.9%	26.6%

(a) Exclusive of Federal, state, and local income taxes; payments of interest; payments for the retirement of debt; and payments to owners as return on investment.
(b) Bureau of Mines, *Mineral Yearbook*, 1966
(c) *Joint Association Survey*, Vol. 2
(d) The 1966 Joint Association Survey questionnaire specified that direct overhead was to be included. In prior years, the instructions were not as explicit and all direct overhead for production may not have been reported
(e) B, 4 ÷ (A,3) x 100 Includes Royalty Oil and Gas
(f) C ÷ 5/6
(g) C ÷ 7/8

1967 STRIPPER WELL DATA
INTERSTATE OIL COMPACT COMMISSION

State	Number of Oil Wells			Annual Oil Production Thousands of Barrels			Oil Reserves (d) Millions of Barrels		
	Stripper (a)	Total (b)	% of Total	Stripper (a)	Total (b)	% of Total	Stripper (a)	Total (c)	% of Total
Arkansas	5 326	6 459	82.5	7 921	21 075	37.6	146	176	83.0
California	25 398	41 608	61.0	59 349	359 219	16.5	1 319	6 942	19.0
Colorado	710	1 730	41.0	2 224	33 905	6.6	11	497	2.2
Illinois	27 735	27 887	99.5	59 175 (f)	59 142	100.0	333	350	95.1
Indiana	4 519	4 831	93.5	10 084 (f)	10 081	100.0	64 (f)	48	100.0
Kansas	40 540	47 597	85.2	64 296	99 200	64.8	429	647	66.3
Kentucky	11 615	13 255	87.6	10 605	15 535	68.3	34	96	35.4
Louisiana	12 853	30 670	41.9	11 002	774 527	1.4	128	5 669	2.3
Michigan	3 697	4 004	92.3	4 865	13 664	35.6	35	66	53.0
Mississippi	260	2 557	10.2	848	57 147	1.5	9	363	2.5
Missouri	146	146	100.0	75	75	100.0	-	N.A.	-
Montana	2 403	3 390	70.9	4 731	34 959	13.5	106	439	24.1
Nebraska	338	1 430	23.6	755	13 373	5.6	4	70	5.7
New Mexico	9 038	16 745	54.0	10 513	126 144	8.3	152	1 442	10.5
New York	12 110	12 582	96.2	1 972	1 972	100.0	15	17	88.2
North Dakota	360	2 063	17.5	819	25 315	3.2	23	342	6.7
Ohio	13 388	14 638	91.5	5 362	9 924	54.0	101	114	88.6
Oklahoma	56 839	80 970	70.2	88 851	230 749	38.5	723	2 056	35.2
Pennsylvania	43 925	45 426	96.7	3 671	4 387	83.7	69	164	42.1
Tennessee	32	33	97.0	8 (f)	7	100.0	-	N.A.	-
Texas	89 985	192 001	46.9	145 289	1 119 962	13.0	2 320	17 308	13.4
Utah	78	869	9.0	153	24 048	0.6	4	261	1.5
Virginia	4	4	100.0	3	3	100.0	-	N.A.	-
West Virginia	12 859	12 989	99.0	3 526	3 561	99.0	88 (f)	57	100.0
Wyoming	2 693	8 547	31.5	3 504	136 312	2.6	135	1 172	11.5
Other	-	728	-	-	41 456	-	-	703	-
Total U. S.	376 851	573 159	65.7	499 601	3 215 742	15.5	6 248	38 999 (e)	16.0

SOURCE:
(a) Nat'l. Stripper Well Survey, IOCC, Jan. 1, 1968
(b) Mineral Ind. Surveys, Bureau of Mines, Aug., 1968
(c) 1967 Reserve Survey - API, AGA, CPA, Vol. 22, May, 1968
(d) Proved plus Indicated Additional Reserves
(e) Includes 7,622,413 barrels of Indicated Additional Reserves
(f) Differences between reporting sources, i.e. Stripper exceeds Total

ARRAY OF AVERAGE U. S. PRODUCING RATES BY STATES 1967

tate	Average Daily Production Bbl/Day/Well	Total 1967 Production Thousand of Bbls.	Accumulated Production Ranked According to Average Productio Thousand of Bbls.	Accum. % of Total
1. Pennsylvania	0.3	4 387	4 387	0.1
2. New York	0.4	1 972	6 359	0.2
3. Tennessee	0.6	7	6 366	0.2
4. West Virginia	0.7	3 561	9 927	0.3
5. Missouri	1.4	75	10 002	0.3
6. Ohio	1.9	9 924	19 926	0.6
7. Virginia	2.7	3	19 929	0.6
8. Kentucky	3.0	15 535	35 464	1.1
9. Indiana	5.5	10 081	45 545	1.4
0. Illinois	5.7	59 142	104 687	3.3
1. Kansas	5.8	99 200	203 887	6.3
2. Oklahoma	7.8	230 749	434 636	13.5
3. Arkansas	9.0	21 075	455 711	14.2
4. Michigan	9.2	13 664	469 375	14.6
5. Texas	15.8	1 119 962	1 589 337	49.4
6. South Dakota	20.3	211	1 589 548	49.4
7. New Mexico	20.8	126 144	1 715 692	53.4
8. California	23.7	359 219	2 074 911	64.5
9. Nebraska	24.9	13 373	2 088 284	64.9
0. Montana	27.8	34 959	2 123 243	66.0
1. North Dakota	34.0	25 315	2 148 558	66.8
2. Alabama	38.1	7 348	2 155 906	67.0
3. Wyoming	44.0	136 312	2 292 218	71.3
4. Colorado	45.3	33 905	2 326 123	72.3
5. Mississippi	61.3	57 147	2 383 270	74.1
6. Nevada	66.5	279	2 383 549	74.1
7. Louisiana	68.7	774 527	3 158 076	98.2
8. Utah	75.9	24 048	3 182 124	99.0
9. Florida	103.5	1 568	3 183 692	99.0
0. Arizona	616.2	2 924	3 186 616	99.1
1. Alaska	961.4	29 126	3 215 742	100.0
Total U. S.		3 215 742		
exas Detail:				
Panhandle	6.8	34 707	34 707	3.1
East Texas Field	8.6	51 915	86 622	7.7
All Other Areas	10.4	296 530	383 152	34.2
West Texas	21.5	520 994	904 146	80.7
Gulf Coast	31.0	215 816	1 119 962	100.0
Total Texas	15.8	1 119 962		

Source: Bureau of Mines, *Mineral Industry Surveys*, May, 1968

CHAPTER TEN

Question No. 25(a)

State Conservation Controls

25(a). State proration and conservation controls remain as at present or are changed so as to bring about reservoir production at maximum efficient rates.

Question 25(a) requires a response to Questions 23 and 24 under two alternative assumptions--first, that state proration and conservation controls remain as at present and second, that they are changed to bring about reservoir production at maximum efficient rates.

These two basic assumptions have been identified, where appropriate, in the responses to Questions 23 and 24, and therefore Question 25(a) is not answered separately.

23. Would unrestricted imports tend to bring U.S. oil prices into closer parity with prevailing prices in other markets? Would such changed U.S. prices make unprofitable and thus discourage domestic exploration? If so:

(a) To what extent do significant discoveries result from existing exploration efforts motivated by the prospects of finding marginal reserves or supported from the profits of marginal operations?

(b) Would there be significantly less exploration for substantial discoveries such as those indicated in offshore areas or in Alaska? Or would such activity be undertaken even at world market prices?

(c) Might such exploration be encouraged by a relaxation of domestic production controls, if any, that inhibit efficient production at substantial pools? Would such relaxation tend to occur if import restrictions were reduced or removed?

Provide the same information with respect to effects on development of known domestic fields.

(Question 25(a)-First Part) - State proration and conservation controls remain as at present.

Under conditions of unrestricted imports, U.S. crude oil prices would tend to decrease. At the same time, throwing an increased crude demand on foreign sources would tend to increase FOB prices of foreign crude. Increased foreign-flag tanker requirements would tend to increase transportation costs. Both factors would tend to increase the landed cost of foreign crude at U.S. ports.

These changed prices would seriously impair profitability, thereby curtailing funds available for investment and significantly discouraging much of the domestic exploration in progress today.

a) Exploration is not motivated by prospects of finding marginal reserves, nor is it supported specifically by the profits of marginal operations. The motivation for the continued exploration of a given area is the prospect of a significant discovery. The size of such a discovery will vary from area to area due to geological phenomena. Also, the size of the capital exposure will vary relative to the potential reward involved, but the exploration impetus is always an adequate return on the capital invested. An operator must have a reasonable chance for a discovery profitable enough to cover the dry holes and marginal wells he will unavoidably drill. No operator knowingly drills dry holes or marginal wells, but this eventuality is a possibility each time a well is drilled.

b) There would be significantly less exploration effort to find substantial discoveries such as indicated in offshore areas or in Alaska. If prices were to drop to the levels of the relatively lower foreign crudes, it is doubtful that the reduced profitability would be sufficiently attractive to encourage the investment of the funds required for the direct exploration effort, to say nothing of the bonus payments usually associated with the areas of large potential.

c) (Not applicable - see answer in second part.)

With a substantially reduced domestic crude oil price, there are a few fields that have been found that could be developed profitably. There are many fields that are only moderately profitable to develop at the present price of oil, and a substantial reduction in price would preclude their development. Development of new secondary recovery projects would be uneconomical at substantially reduced crude prices. Failure to produce any of these reserves would result in a permanent loss of a natural resource.

(Question 25(a) - Second Part) - State proration and conservation controls are changed so as to bring about reservoir production at maximum efficient rates.

These changed prices would seriously impair profitability, thereby curtailing funds available for reinvestment and significantly discouraging much of the domestic exploration in progress today. Most U.S. fields now produce at MER (maximum efficient rate). In the case of the few fields that are prorated below MER, allowing production at MER would tend to improve the profitability of the companies operating in those fields.

The various state regulatory bodies serve many important purposes other than prorationing. These include: protection of individual rights; encouragement of wider well spacing; unitization and maximum economic recovery; prevention of physical waste and pollution; and, in general, the development and operation of reservoirs using sound geological and engineering principles and practices.

In a recent report, *Impact of New Technology on the U.S. Petroleum Industry*, the NPC states that half of the 70 billion barrels of oil added to U.S. recoverable reserves between 1946 and 1965 resulted from improvements in recovery technology. This improved recovery technology was encouraged by present state conservation regulations.

24. If production controls were relaxed, would domestic production increase or decrease:
(a) If imports continued at present levels; and
(b) If imports were unrestricted? What would be the effect on ultimate recovery?

a) If all production controls (market prorationing, ratable take laws, correlative rights protection, etc.) were eliminated and imports continued at present absolute volumes, domestic production would increase to meet increasing domestic consumption. Initially, this expanded domestic market would exert a downward pressure on crude prices as the elimination of conservation controls permitted increased production of lower cost oil. These downward pressures could result in the premature abandonment of some stripper well production (the generally accepted definition of a stripper well is one that averages 10 barrels per day or less) which, in turn, would result in reduced ultimate recovery. A general

instability would probably prevail, reminiscent of conditions that led to the development of the various state market demand prorationing systems. Subsequently, as the relatively lower cost excess capacity is eliminated earlier than otherwise would have been the case, the downward pressure on prices would reverse.

b) If all production controls were relaxed and if imports were unrestricted, domestic crude prices would decline to a rising world market price structure. Production from low-cost domestic fields would increase to capacity, but this would be offset by the loss of most of the stripper production and perhaps even production from wells currently considered as being just above the stripper category.

The earlier abandonment of even more stripper well production than is suggested in (a) above would further aggravate the reduced ultimate recovery.

CHAPTER ELEVEN

Question No. 42

Alaskan Oil

CHAPTER ELEVEN

42. As regards recent and apparently large oil discoveries in Alaska and possible additional discoveries elsewhere on the North American continent, what reasonable estimates are now possible about the following questions:

(a) The size of the several oil pools discovered;

(b) The per barrel cost of exploration, development, and extraction from those pools; and

(c) The costs of delivery of oil extracted from those wells:

(i) To the principal potential market areas in the United States;

(ii) To noncontiguous States and territories; and

(iii) To foreign nations.

Question 42 is addressed primarily to the North Slope of Alaska and the potential for extension of this new oil province into the Canadian Arctic. Questions 23(b), 23(c), 44, 45, and 46 also relate to this area and therefore comments related to these questions have been incorporated in the discussion.

The North Slope of Alaska offers promise of being the most significant discovery of petroleum on the North American Continent in several decades. The early stage of exploration and development, the limited availability of factual data and the competitive nature of the industry activity in the Arctic make it impossible to answer in precise quantitative terms Question 42 as posed. It is, nevertheless, useful to comment on the factual information which is available and to provide some qualitative judgments on the significance of the Alaskan North Slope, thereby placing it in proper perspective as an emerging new section of U.S. petroleum resources.

At year-end 1968, the oil industry had some 10.8 million acres under lease in Alaska as a whole. The industry had drilled 614 wells, 294 of which had been completed as producers. At year-end there were 173 active oil completions and 34 active gas completions. During the first half of 1969 industry crude oil production averaged almost 192 thousand barrels per day compared to an average of 79 thousand barrels per day during 1967 and 181 thousand barrels per day in 1968.[1]

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[1] Alaska Department of Natural Resources, Oil & Gas Division, *Year-End Report*, (1968).

Cumulative expenditures in Alaska by the oil industry totaled $1.9 billion through 1968.[2] However, since cumulative oil production had been not quite 160 million barrels,[3] gross revenue has been less than $0.5 billion, so that through this period the industry must still be more than $1.5 billion in the red. With proven crude oil reserves at year-end being about 373 million barrels[4] in South Alaska, the area where the predominant portion of these expenditures was made, favorable performance and reserve additions will be required from the additional recovery projects, which have recently been initiated, for industry merely to recover its investments. At this time it appears that North Slope investments may yield better results, at least at today's typical U.S. crude prices. However, an investment approaching that spent statewide to date will be required before North Slope production can even be initiated.

The North Slope of Alaska covers approximately 69,000 square miles, extending 500 miles E-W from the Bering Sea to the Canadian border, and 50-200 miles N-S from the Brooks Range to the Arctic Ocean. Of this 69,000 square miles, only 23,000 square miles, or 15 million acres, are available for competitive exploration. The rest lies within the Naval Petroleum Reserves No. 4 on the west, which was set aside in 1923, and a wildlife refuge on the east, which was established in 1960.

Oil seeps were first noted on the North Slope by explorers in the late 1800's and there are at least nine oil and two gas seeps on the North Slope which have been investigated and described.[5] In the early 1900's, mining claims were staked on the seeps near Point Barrow and attempts were made to exploit the oil. In 1923, private investigations ceased when the Naval Petroleum Reserves were created by Presidential Order.

The Navy organized and carried out the first extensive petroleum-exploration program on the North Slope from 1944 to 1953. The U.S. Geological Survey conducted the geological investigations, and the United Geophysical Company carried out the geophysical surveys. The firm of DeGolyer and MacNaughton was retained as geologic consultant.

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[2] Alaska Oil & Gas Association, *Year-End Report*, (1968)

[3] American Petroleum Institute, *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1968*, vol. 23, May 1969.

[4] Ibid.

[5] U.S.G.S. reports.

The Navy drilled 37 wells and 45 shallow core tests totaling 175,000 feet of hole on 18 separate structures. The wells were designed to test the large surface anticlines in the foothills folded belt and areas adjacent to oil seeps. The results of this program were three oil and two gas fields. The largest oil field is Umiat. The oil is in Lower Cretaceous sands within the permafrost at a depth of about 1,100 feet. The reserve estimates range from 18 million to 93 million barrels of oil. The Simpson field is credited with 12 million barrels of oil. The Fish Creek field is a small, one-well field with no estimate on reserves.[6]

The Point Barrow gas field has about 7 billion cubic feet of gas reserves and is being utilized by the village at Point Barrow. The Gubik field is credited with reserves estimated to be 300 billion cubic feet of gas.[7] In summary, roughly 100 million barrels of oil and 300 billion cubic feet of gas reserves were discovered by the Navy on the North Slope.

No further drilling was conducted on the Slope until 10 years later in 1963 when British Petroleum and Sinclair began drilling in an attempt to extend the Navy play on the foothill structures. A small gas discovery was made near the Umiat field. In addition, Union of California and Sinclair-British Petroleum each drilled unsuccessful Paleozoic tests near the Arctic Coast, and Humble-ARCO drilled a dry hole on a foothill structure. In all, eight unsuccessful wildcats were drilled between 1963 and 1967.

The ARCO-Humble Prudhoe Bay-1 was spudded in the spring of 1967 and the well was completed as a discovery in June 1968. This was followed by the Sag River State-1 located 7 miles to the southeast which confirmed the discovery and indicated a major oil accumulation.

Over the winter of 1967-68, there was one active rig on the North Slope and that was by ARCO-Humble. At present, there are 18 rigs active: ARCO-Humble 2, British Petroleum 4, Mobil-Phillips 4, Pan American 1, Standard of California 2, ARCO-Home 1, Texaco 2, Colorado Oil and Gas 1, and Hamilton Bros. 1. In addition, Shell is currently setting up one rig. Fifteen of the rigs are drilling in the vicinity of Prudhoe Bay in efforts to extend the field and, perhaps more importantly, to evaluate open state acreage that is scheduled to be offered for competitive bidding by the state in September 1969. As a result of the pending State lease/sale, all the wells are drilled "tight," and very little information is available. As of July 15, 1969, industry had completed 15 wells, including the

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[6] Ibid.

[7] Ibid.

Prudhoe Bay discovery, but reliable information is available on only three of the wells that have been confirmed as producers by the operators.

Seventeen seismic crews were operating on the North Slope during the winter of 1968-69. Most of the industry onshore seismic activity was suspended at the beginning of the summer months in order to minimize damage to the tundra. However, by early July it was reported that there were eight seismic crews supported by helicopter in operation. Also, a group of companies has arranged to conduct a joint offshore seismic survey during the summer of 1969 when the ice breaks up. The U.S. Coast Guard is also planning to conduct some seismic and bathymetric survey work during the summer.

Little authoritative information is available on North Slope reserves outside of the figures mentioned earlier for NPR 4. DeGolyer and MacNaughton, who had been the Navy's geological consultants on NPR 4, have assessed the Prudhoe Bay reserves for ARCO. Their report indicates that "...recovery of 5 to 10 billion barrels of oil from the structure...is a reasonable expectation for a structure of the size indicated by seismic interpretation with the sand characteristics and saturation which have been shown in the productive interval in the two wells." By way of qualification, it should be pointed out that this estimate was based on *two* wells located *7 miles* apart, together with seismic data, cores, and well logs. There had been no substantial production from these wells on which to base an evaluation of expected recovery. In testimony before the Subcommittee on Antitrust and Monopoly of the Senate Committee on the Judiciary, Mr. M. A. Wright, Chairman of the Board of Humble Oil & Refining Company, one of the owners of the discovery wells, commented on DeGolyer and MacNaughton's evaluations as follows: "There is no question but that it (Prudhoe Bay) is a large oil field and probably the largest oil field that has been found in North America. The figures that DeGolyer-MacNaughton published after looking at the data of ARCO, who is our partner, was that this oil field could have reserves of the order of five to ten billion

barrels, and this is the right order of magnitude on that field."[8] This statement was made after Humble and ARCO had drilled seven wells in the vicinity. From this range of reserve estimates, the Prudhoe Bay field could represent an increase of as much as 16 to 33 percent of the total U.S. crude reserves of 30.7 billion barrels reported by the American Petroleum Institute. These Alaskan reserves are also equivalent to about 60 to 120 percent of the total crude reserves which are credited as of this time to Canada.[9]

The proposed State lease/sale of open acreage in the vicinity of the Prudhoe Bay field which is to be held in September 1969 precludes any detailed data on exploration results to date being available before that time. While some additional information will become available upon completion of the proposed lease/sales, there will not be any conclusive or complete information on discovered reserves available even then. Substantial development drilling and production experience must be gained before a true reserve evaluation can be made. Only actual experience with producing operations will permit data to be accumulated on well and reservoir performance, both of which are necessary to evaluation of operating cost and recovery efficiency. The experience in the Sprayberry Trend of West Texas in the 1950's is a strong reminder that early results can be very misleading and must be used cautiously; only about one-tenth as much oil as was originally expected will be produced from that field. A

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[8] DeGolyer and MacNaughton has prepared a *Report on Estimates of Additional Recoverable Reserves of Oil and Gas for the United States and Canada* for the Office of Science and Technology of the Executive Office of the President. This report stated in its discussion: "...we have of necessity done some speculating as regards additional reserves recoverable from Alaska, Canada, and the 48 contiguous United States..." The report continued on page 17, "At the present state of exploration and development in Alaska, one hazards an estimate today only with the knowledge that he may change it tomorrow. With this in mind, an estimate of recoverable reserves of 50 billion barrels of oil and 280 trillion cubic feet of gas is not unreasonable for Alaska (including offshore areas). Roughly half of these reserves probably will be found in the northern part of the state."

This "speculation" on ultimate discoveries of 25 billion barrels for the northern part of the state is not to be confused with the reserve estimates for the Prudhoe Bay field mentioned above.

[9] API, loc. cit.

Trans-Alaska pipeline system has been announced for completion in 1972 as the first step to move North Slope oil to the West Coast of the United States, so production cannot begin before then.

As will be discussed later, facilities will also be required to move oil to the Midwest or East Coast of the United States, and these will probably not be completed before 1973 or 1974. So it will be the mid-1970's before significant experience can be gained with actual producing operations. By that time the industry will also have learned the nature of other possible oil fields on the North Slope; to date the Prudhoe Bay field is the only actual discovery which has been verified. No detailed information is generally available on other potential North Slope reserves. The work being done by the individual companies exploring in this area is kept extremely confidential due to the competition for unleased acreage to become available in future lease/sales. It can be assumed, however, that the Prudhoe Bay discovery is but the first in what is likely to be a major oil province. It is generally felt, however, that if the magnitude that has been suggested for the Prudhoe Bay discovery is substantiated, subsequent discoveries will probably be of a lesser size.

The entire Arctic region of the world can now be considered as prospective to one degree or another. In addition to the Alaskan North Slope discovery, Russia has proved significant deposits in the Siberian Arctic. To the east, the Canadian McKenzie River delta and Arctic archipelago are being explored.

"Per barrel cost of exploration, development and extraction from those pools" are difficult to establish and their values are of questionable significance. Petroleum exploration is a continuing activity of the industry spread over many geographic areas. Each exploration venture is based on the accumulation of knowledge which an individual company has been able to put together over time, drawing upon both its own experience and the information it is able to develop from observation and analysis of the industry's efforts. The costs of a venture, therefore, consist not only of the direct geological, geophysical and drilling expenditures on the discovery well on a particular prospect, but also the expenditures on numerous prior efforts, both successful and unsuccessful. A successful exploration venture will, in fact, have called upon knowledge gained not only in the geological province under investigation but also data from other seemingly unrelated geologic provinces as well as work carried out in geologic and geophysical laboratories. Per-barrel exploration costs are therefore of little meaning unless they are developed on the broadest base of accumulated expense and effort and includes both the successes and failures in many

geographic areas over a substantial period of time. Since the North Slope of Alaska is actually just in the early stages of commercial development, it is obvious that definitive information of the direct costs and results of exploration will not be available for some time to come. The foregoing limitations on their use and significance when they do become available must be borne in mind.

"Per barrel development and extraction costs" on the North Slope cannot be developed with any degree of accuracy at this time nor will they be available for a number of years. Such costs will be determined by the individual well drilling costs, rates of production, maintenance and operating costs and ultimate recovery from the various fields. While it will not be necessary to await depletion of the reserves to develop adequate estimates, substantial development and operating experience must be gained before meaningful cost-per-barrel numbers can be available. It is obvious, however, that drilling costs will be extremely high. Estimated drilling costs are $142 per foot in Alaska compared with average U.S. costs in other producing states of $13 per foot.[10] Operating costs are about $18,000 per day for an Arctic drilling rig as compared with $10,000 per day for an offshore rig in the Gulf of Mexico, and about $3,000 per day for a conventional West Texas land rig. While no data are available at this time, it is logical to assume that per-well producing costs, once the wells are placed on production, will similarly be substantially higher than that experienced in the "lower 48." There is evidence from the few reported well tests that high per-well producing rates may be possible. High rates coupled with wide well spacing will be essential to keep costs per barrel within the range necessary to make North Slope production economically attractive.

Delivery costs from the Arctic are another unknown, the final value of which will be dependent on the actual magnitude of investments yet to be made and transportation systems yet to be designed. ARCO Pipeline Company, BP Pipeline Corporation, and Humble Pipe Line Company have announced plans to construct an 800-mile, 48-inch Trans-Alaska Pipeline System, with an initial capacity of 500,000 barrels per day at an estimated cost of $900 million. These estimates do not include any investments for transportation facilities needed to move the oil beyond the pipeline terminus in South Alaska. They also do not include investments for subsequent expansions in the pipeline which could bring its capacity to 2,000,000 barrels per day and its ultimate cost to about $1.5 billion. Even so, this pipeline project will represent the largest private

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[10] Western Oil & Gas Association Report, (1968).

industry construction project in history. The operators have not yet published tariffs or indicated specifically the unit transportation costs to the various markets where the crude might ultimately be sold. An ARCO representative testified before the Alaskan Legislature that Trans-Alaska pipelines costs for the 1972-80 period could be $0.75 to $1.00 per barrel and tanker costs from South Alaska to West Coast ports would be an additional $0.25 to $0.30 per barrel.

No definite plans have been announced as yet by any of the operators for transportation facilities to areas outside District V. Delivery costs to Midwest markets by various transportation routes, either across Alaska to the West Coast by tanker and to Chicago by pipeline, or across Alaska and Canada directly to Chicago by pipeline, have been quoted in the trade press by various industry observers in the range of $0.80 to $1.25 per barrel. On the basis of general industry experience additional costs of $0.15 to $0.20 per barrel would be incurred to move this crude from Chicago to the East Coast. The apparent lack of consistency in these cost figures serves to underscore the observation made above that delivery costs of Arctic oil are still unknown.

Humble, with the support of ARCO and BP, has announced plans to try to establish the feasibility of traversing the Northwest Passage by ice-breaking tanker. Humble spokesmen have indicated that the cost of moving oil to the U.S. East Coast by ice-breaking tankers through the Northwest Passage--if transversing this route proves feasible--could be about $0.60 per barrel less than moving this oil through a transcontinental pipeline. Announcements of the costs of the test voyage with the S.S. MANHATTAN have ranged from $30 to $39 million. Estimates on the cost of the 250,000 DWT tankers which have been visualized for use in this trade in the event the MANHATTAN test is successful, are in the range of $50 million each. Depending on the volumes of crude to be moved, there could be as many as 25 to 30 of these tankers required by 1980, an investment in ships alone of $1.5 to $2.0 billion. With these ships the U.S. merchant fleet would be 2½ times its present size.

Successful development of the Northwest Passage tanker route would make it physically possible to deliver North Slope crude to Northern Europe. With a Trans-Alaskan pipeline in existence, this crude could also be transshipped to Japan. However, North Slope crude, because of its anticipated high investment, operating and transportation costs could not, in all probability, compete with lower-cost Middle East crude at the typical prices which prevail in these markets.

In summary, there is no definitive information which is available or can be made available either on the volumes of North

Slope crude to be moved to various areas or the cost per barrel of such movement. Estimates of ultimate investments for transportation facilities range upward from $3 to $4 billion, depending on the method, routes, and volumes which might finally be involved.

The effects of decisions on U.S. oil import policy could be very pronounced on future developments in both the United States and Canadian Arctic. Each of these areas is being explored on the basis of the assessments by the companies involved of the future U.S. markets for crude. Such assessments almost undoubtedly have assumed the continuation of the U.S. price structure and the availability of the U.S. market for substantial volumes of Canadian crude. Any changes in U.S. import regulations which adversely affect U.S. crude prices or the access to the market by Canadian crude would be reflected in Arctic exploration activities. It is highly doubtful that typical non-U.S. market prices could justify Arctic exploration in competition with oil found in less formidable environments, some of which also possess location advantages with respect to the major crude oil markets of the world. Even the development of some of the lesser Arctic reserves which have been found to date must be subject to question if world prices are assumed to apply in the markets in which the production is to be sold.

There could well be some adverse effect on production growth in the U.S. Southwest when North Slope crude first enters U.S. markets. However, the current limited outlook for growth in reserves and capacities in the "lower 48," together with the projected 3½ to 4½ percent annual growth in the U.S. demand, suggest that any depressing effect will be short-lived. Growing total U.S. requirements necessitate a growth in domestic supplies under current import regulations of about 350 thousand barrels per day each year over the next decade. The North Slope crude can help fill this requirement.

The activities of the domestic petroleum industry both inside and outside of Alaska are influenced by the total environment within which industry operates, not just the magnitude of the North Slope discovery or discoveries in other new oil provinces. This environment includes all of the economic, fiscal, political and technological factors which bear on the industry. Economic assumptions have been discussed earlier in this report. The impact on petroleum exploration of taxes and expectations of profits has been discussed by industry spokesmen before the House Ways and Means Committee. Of the political factors besides taxes with which the industry must cope, U.S. import regulations and state proration and conservation regulations are the most important. North Slope and similar high-risk exploration ventures would be greatly inhibited, if not

precluded, by any change in import regulations which would result in significant reductions in the level of prices for U.S. crudes.

Contrary to the implications of Question 23(c), the system of state conservation and proration regulations operates not as a deterrent to but as a stimulant for exploration. Each exploration venture must bear technical (geologic) risks. The conservation and proration regulations of the several states serve to moderate the economic risks. By assuring an operator that there will be an opportunity to produce and market production from those exploration ventures which are of limited success, these conservation and proration regulations serve to encourage exploration. This aspect of state regulations more than offsets any moderating effects that may be based on fear of proration to less than maximum allowable rates. Without these state regulations, only the largest and lowest cost discoveries would be economic; many of the lower quality discoveries would never be developed and produced. The cash flow generated by these limited exploratory successes contributes to the capital formation which is essential to support subsequent exploration ventures.

CHAPTER TWELVE

Question No. 51

Domestic Oil Shale

CHAPTER TWELVE

51. What is the probable course of development of domestic oil shale? Would such development be accelerated or impeded if import quotas are maintained, tightened, relaxed, or removed? To what extent could such development be accelerated in the event of urgent national need for production? What are the best estimates of the unit cost of oil refined from domestic oil-shales under efficient and possible conditions of production by 1975? By 1980?

The probable course of development of domestic oil shale will be affected by the domestic supply and the economic competitiveness with conventional petroleum. Under the existing environment, that is, with import controls maintained at about present levels and present trends in exploration and development continuing, a shortage of domestic oil could develop in the middle to late 1970's indicating a need for synthetic crude during that period. Shale oil might be economic in this environment and by 1980 production of shale oil could be in the range of 500,000 to 1,000,000 barrels per day. If import quotas are tightened and the price of oil increases, the economics of shale oil development would be enhanced and the rate of development might be accelerated by several years. Conversely, with relaxation or removal of import controls the development would be impeded.

No fully proved technology for economic shale oil production exists today. While no estimate is made here of the time which would be required under normal conditions to develop and prove such technology, once this technology is proved and available it would take some three years to place a plant into operation. In the event of urgent national need and if cost were no object, an industrywide all-out program might compress the entire process and permit production of 100,000-200,000 barrels per day of shale oil within 3 to 4 years.

Estimated costs of oil refined from domestic oil shales are given in a study published in May 1968, by the U.S. Department of the Interior entitled *Prospects for Oil Shale Development.* The unit-cost of such refined shale oil and by-product from an improved "first generation" plant producing 62,000 barrels per day of oil is estimated to be $3.86 per barrel of oil (1967 dollars). This cost includes a 20 percent discounted cash flow capital charge on an overall investment of $203 million. On a 12 percent discounted cash flow basis, the cost is estimated at about $2.75 per barrel of oil. There is a good chance that increases in construction and operating costs would push the

cost of shale oil somewhat above these figures. These costs do not include a charge for the shale resource and include a 15 percent depletion rate on mined shale.

While there is no actual commercial plant in operation, refined shale oil, including the cost for resources, is not believed to be competitive now with conventional crude oil.

CHAPTER THIRTEEN

Question No. 52

Oil from Coal

CHAPTER THIRTEEN

52. What is the probable course of development of oil from coal? Would such development be accelerated or impeded if import quotas are maintained, tightened, relaxed, or removed? To what extent could such development be accelerated in the event of urgent national need for production? What are the best estimates of the unit cost of oil from coal under efficient and possible conditions of production by 1975? By 1980?

As in the case for shale oil, the development of synthetic oil from coal will be affected by the domestic supply and the economic competitiveness with conventional petroleum. Several promising processes for the production of synthetic oil from coal have been demonstrated in bench scale work. Most of the work has been done under support of the Office of Coal Research, Department of the Interior. At the present time only the Consol Synthetic Fuel Process has advanced to a demonstration plant stage (60 B/D product) but no results have been published on operations.

In the present environment for oil, the first commercial process for producing synthetic oil from coal is a number of years away. Although it is expected that development would be impeded or accelerated by the respective relaxation or tightening of import controls, the major controlling factor on the pace of development is the need for a breakthrough in the technology of producing low-cost hydrogen for the process.

Evaluations of two of the processes by independent contractors have been published by the Office of Coal Research. Both were made on the basis of conceptual process designs scaled-up from laboratory and small pilot plant data; both designs were for a mine-mouth refinery producing finished products. In one, the Ralph M. Parsons Company in 1968 evaluated the Consol Synthetic Fuel Process (OCR Contract No. 14-01-0001-255 Research and Development Report No. 45). They reported that for a plant producing approximately 50,000 barrels per day of finished gasoline, the product would have to be sold at the refinery gate at an average price of 15.5¢ per gallon ($6.50 per barrel). At this price a return of 6.4 percent would be achieved on an investment of about $5,000 per daily barrel. In the second study, the American Oil Company made an evaluation in 1967 of the Hydrocarbon Research Institute's process, "Project H-Coal," under OCR Contract 14-01-0001-1188. In this design the product mix consisted of two-thirds gasoline and one-third distillate fuels. They reported that from a 100,000 barrels per day plant, motor fuel would have to be sold for 12.1¢ per gallon and distillate fuel at 9.1¢ per gallon ($4.67 per barrel product) to realize a 10 percent DCF rate of return on a facilities investment of

about $4,000 per daily barrel. In making economic comparisons it is to be noted that in the evaluation of the Consol process, hydrogen requirements were obtained from coal using known and proven processes, while in the evaluation of the HRI process, hydrogen requirements were obtained from methane reforming of purchased gas. Both of the foregoing cost estimates were highly qualified, inasmuch as they reflect gross extrapolations of laboratory and small pilot plant experience.

CHAPTER FOURTEEN

Question No. 53

Fuel Convertibility

CHAPTER FOURTEEN

53. To what extent does the cost of converting industrial, municipal, and household facilities from the use of petroleum to the use of alternative sources of energy operate as a barrier to such conversion?

The initial selection of energy source and the conversion to other sources are both made on the basis of the direct energy and facilities costs as well as nondirect factors such as availability, convenience, process needs and cleanliness. In general, the cost of converting from oil or gas to the use of alternate sources of energy operates as a significant barrier to conversion. Unless the petroleum price gets well out of line with competitive energy supply, the conversion cost would be the restraining factor in most applications. The utilities sector is probably the most price sensitive. Even in this sector, conversion decisions would be influenced by factors other than price, such as an assured fuel supply as well as conversion cost considerations.

CHAPTER FIFTEEN

Question No. 55

Effect on Natural Gas

CHAPTER FIFTEEN

55. If domestic oil production declined, would natural gas production decline significantly? If domestic oil exploration is reduced, would natural gas discoveries in the United States diminish proportionately? How is the answer to this question affected by the answers to question 67?

Approximately 25 percent of the total natural gas produced is "associated-dissolved" gas from crude oil production. With a decline in domestic crude oil production, the accompanying decline in the production of this gas would represent a significant decline in total natural gas production. Exploration effort can be selectively directed toward oil-prone or gas-prone areas. Yet, oil exploration and gas exploration are generally joint activities using the same people, techniques and equipment. Therefore, whenever oil and gas exploration is reduced, gas discoveries consequently decrease.

Present regulated gas prices apparently have not provided sufficient economic incentive to encourage nonassociated gas exploration. Unless gas prices are increased significantly, a decline in natural gas discoveries can be expected.

APPENDICES

UNITED STATES DEPARTMENT OF THE INTERIOR

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

COPY

June 9, 1969

Dear Mr. Abernathy:

"The Cabinet Task Force on Oil Import Control has asked our assistance in obtaining specific data for their work. Could the National Petroleum Council respond to the attached questions by August 1st?

Sincerely yours,

/S/ WALTER J. HICKEL

Secretary of the Interior

Enclosures

Mr. Jack Abernathy
Chairman
National Petroleum Council
Box 14837
Oklahoma City, Oklahoma 73114

Memorandum to National Petroleum Council on data and information needed in connection with certain questions from the list published by the Cabinet Task Force on Oil Import Control, May 22, 1969

The Department of Interior has been gratified by expressions on the part of the NPC of willingness to cooperate with the Cabinet Task Force on Oil Import Control, particularly as regards its search for relevant economic data. The Department hopes that the NPC and/or some of its constituent groupings or member associations will be able to help the Government gather data and responses from interested parties which individual firms might not be willing to disclose directly for publication and identification on the record. The Council and the Associations are, of course, invited to make their own responses to any or all of the general and detailed questions published by the Task Force in the Federal Register for May 22, 1969 (34 Fed. Reg. 8055). The Department asks to call particular attention to the quantitative estimates and reliable data support called for in Detailed Questions 20, 21, and 22.

These are:

20. What is the average delivered cost of domestic oil and bulk oil products in the U.S., by types and grades, by principal production area and market area, and what are the main elements in these costs: (include data for most recent period available)

    Well head costs, per barrel
    exploration costs, including lease costs
    drilling and equipment costs
    production costs, including royalties.

    Transportation costs (crude), including gathering cost

Refining costs

Transportation costs (products) to bulk terminals

Specify taxes per barrel as a separate element

Use as the sample production areas:

Louisiana - Texas Gulf Coast, including offshore

Mid-Continent

Permian Basin - West Texas

California

Southern Alaska

Use as sample marketing areas:

New England

Middle Atlantic

Great Lakes: Chicago-Cleveland

Seattle

Los Angeles

Hawaii

Texas Gulf Coast, including points of trans-shipment

21. Taking account of what is known about the array of costs of production from most efficient (lowest cost) pools to the least efficient, what would be the annual volume of oil produced in the U.S. in the immediate future at the following average wellhead prices (assume that each pool is restricted only to its maximum efficient rate of production (MER) and that producers expect both the market price and money costs of labor and equipment to remain the same for an extended period of 10 years or so.)

$10.00 per barrel
5.00
4.00
3.50
3.00
2.50
2.00
1.50

What would be the effect of these prices on available supply over time? Would the expected annual production at that price remain constant for the next 5 or 10 years, or would it increase or decrease and if so by how much, i.e., along what path?

(If estimates of production from North Alaska are made, they should be given separately and not mingled with the rest.)

22. Under existing production controls and prorationing systems, what is the array of wellhead costs of oil in the U.S., from marginal wells to the most efficient pools? Can you estimate how much oil is produced under high-cost, median-cost, and low-cost conditions this year, indicating your own measures of these cost brackets? If your organization produces oil, how is that production distributed among these cost categories?

It would be highly desirable to have such estimates based on reasonably complete industry data for individual firms. Such individual firm data need not be disclosed but can be aggregated by the Council or by constituent groupings in such a way as not to disclose competitive information. Specifically,

(I) In order to develop the short-run industry supply response to movements of price and/or changes in availability of imported oil, the following information would be useful, disaggregated by major producing area and by producing property if possible, with onshore separated from offshore. It would be especially helpful to obtain production and lifting cost data based on individual producing property operated by the firm:

A. Production characteristics and producibility annually for last 5 years:

Average well depth and proportion of stripper wells

Production per well (gas, oil, liquids)

Estimated reserves (gas, oil, liquids)

Annual production rate compared to MER or Yardstick allowable

Producibility (optimum over the next 5(10) years)

B. Costs

Lifting costs (actual) per barrel, annually for last 5 years

Lifting costs (current) if field were produced at MER or equivalent

Secondary-recovery costs estimated as necessary to sustain estimated producibility for next 5 (10) years

Annual workover and maintenance costs for last 5 years

Maximum production rates sustainable for 2 years and extra costs that maximum production would create

Royalties, annual, for last 5 years

(II) In order to assess the cost of discovering, developing, and producing new reserves of crude oil, the following information would be useful if based on the experience of <u>individual companies</u> for the postwar period, disaggregated by major producing area if possible, and with onshore separated from offshore:

A. Annual data on exploration, development, and production costs, allocated as follows:

<u>Exploration</u>:

geological and geophysical activity
drilling
lease acquisition
lease rental
other (explain)

Development:

drilling
equipping leases

Production:

producing costs
production taxes
ad valorem taxes

Overhead:

exploration
development
production

Royalties

B. Annual data on number of exploratory and development wells drilled, each classified by depth and by whether or not it is successful. Suggested depth ranges might be 0-1,250 ft; 1,250 to 2,500 ft; 2,500 to 3,750 ft; 3,750 to 5,000 ft; 5,000 to 7,500 ft; 7,500 to 10,000 ft; 10,000 to 12,500 ft; 12,500 to 15,000 ft; 15,000 to 17,500 ft; 17,500 to 20,000 ft; and over 20,000 ft.

C. Annual data on physical production of crude oil and natural gas, by company and by area.

D. Annual data on reserves discovered. It would be useful to have this information both for proved reserves as estimated at the time of discovery and for total reserves imputed to the year of discovery.

E. The discount rate used for internal company calculations and investment decisions.

Certain other questions also seek data that the NPC or constituent groupings or Associations might help the Task Force to find, accumulate, or evaluate, such as Detailed Questions 14 (especially the last sentence), 15, 19, 25(a), 42, 51, 52, 53 and 55.

There are still other questions, not involving statistical data to any large extent, to which individual respondents might prefer to respond through the Council or a constituent grouping or association, which can collate and summarize the replies in its own presentation on the record. This is an available means of response if a firm prefers not to reply to a given question individually. Possible examples of such questions are Detailed Questions 7 and 8. Individual answers will, of course, be welcomed if respondents wish to make them on the open record.

CABINET TASK FORCE ON OIL IMPORT CONTROL

MANDATORY OIL IMPORT PROGRAM

Procedure and Inquiry

The Task Force on Oil Import Control was established to make a comprehensive review of the U.S. oil import control program. This study is being undertaken to consider the Mandatory Oil Import Program, its present effects and the impact to be expected from possible changes in the program. Several areas of inquiry were announced on April 8, 1969. Interested persons were invited to submit their views and urged on April 21 to begin immediately to prepare for their submissions. Formal notice was published in the FEDERAL REGISTER on May 2, 1969.

The present notice lists procedures in Part One, general areas of inquiry in Part Two, and more detailed questions in Part Three. The general and more detailed questions reflect the Task Force's preliminary formulation of the issues and do not preclude either interested parties or the Task Force from broader, narrower, or differing formulations in response to submissions or to developments in its own thinking.

PART ONE: PROCEDURES

1. All persons interested in this subject are invited to submit economic data, both historical and projected, bearing on the questions listed in this notice. Submissions may be made by state or local governments, individuals, firms, or associations (which should state the character of their membership). Foreign governments should make submissions through the Department of State.

2. Interested persons may address themselves to any or all of the questions listed below, but no one should feel compelled to respond to every question. Many questions can be answered effectively only by Government agencies or by others with special knowledge. Nevertheless, the full list is being published in order to inform the public of the issues being canvassed by the Task Force.

3. For ease of comprehension and comparison, all submissions should, insofar as practicable, follow the outline of the general questions listed in Part Two. Comments, statements of views, and arguments addressed to or involving legal issues should be accompanied by a full citation to the source of authority—statute, Executive order, Proclamation, regulation, judicial or administrative decision—in question. Economic data and projections should also be fully identified in each instance as to source, date, and methodology of development. It is vital that all data be accompanied by an explicit statement of the methodology by which the underlying statistics were obtained and processed.

4. Persons with common interests are encouraged to make joint submissions to the maximum possible extent and to confine separate submissions to any views or facts peculiar to each. Whenever individual company data would disclose confidential cost or other data, such companies are encouraged to make joint submissions through organizations that can aggregate such data in a meaningful way without disclosure of confidential figures for or to individual companies.

5. All submissions to the Task Force from outside the Federal Government other than proprietary data will be made available to the public in the library of the Task Force, 726 Jackson Place NW., Washington, D.C. 20506. Twenty copies of each submission should be delivered to that address, of which two copies will be deposited in the library. Proprietary data, to avoid deposit in the library, must be submitted separately and identified as such. Any departure from this separate submission procedure—e.g., by including nonconfidential with confidential material—will be cause for deposit of the entire submission in the library.

6. Submissions should be preceded by a concise summary of not more than five (5) pages in length, followed by a text of not more than 50 pages. Within reason, there is no limit on the number of accompanying appendices, charts, or graphs. All pages should be 8½" x 11", with text in black type and double-spaced and must be suitable for reproduction on normal office copying machines. One copy should be in unbound and unstapled form to facilitate copying.

7. Any interested person may read all the submissions in the Task Force library and may, in addition, reproduce one (1) copy of any or all pages on the copying machine the Task Force expects to have available in the library by payment in cash of an appropriate user charge.

8 The Task Force will not accept any submissions in response to the questions listed below before June 16, 1969, or after July 15, 1969. These dates are firm.

9. The Task Force may, after reviewing the initial submissions, propound additional or repeated questions by publication of a similar notice in the FEDERAL REGISTER or by notice to individuals. Whether or not such additional or repeated questions are propounded, all interested parties are invited to submit additional or more refined data, comments, statements of views, and arguments by way of rebuttal, after their own review of initial submissions by other interested parties. For either of these purposes, the Task Force library will be open to receive second-round or rebuttal submissions no later than August 15, 1969. Interested persons may thereafter read and reproduce these second-round or rebuttal submissions as before, but no third-round is contemplated.

10. Any interested person considering himself or itself placed under hardship or at a competitive disadvantage by these procedures should so notify the Task Force in writing on or before June 3, 1969, specifying with particularity the nature of the hardship or disadvantage and the exact procedural change proposed. Any changes considered meritorious by the Task Force will be published promptly in the FEDERAL REGISTER.

11. Insofar as possible, submissions from Federal agencies will conform to the format and schedule stated above.

12. The Cabinet Task Force on Oil Import Control will make publicly available all information furnished to it which can be disclosed without jeopardy to the national security or undue hindrance to the carrying out of the Task Force's basic assignment. This disclosure policy embraces the factual and analytical submissions of Government agencies but not the personal interchange among Cabinet-level officials or Task Force staff. More precisely: All Task Force documents and information relating to the questions it has been asked to study shall be made available to the public unless their disclosure is prohibited by statute or would reveal:

(a) Classified information;

(b) Minutes and other records of the deliberations of the Task Force;

(c) Internal communications, memoranda, and drafts prepared by the individual members, observers, their personal representatives, and the Task Force staff; or

(d) Confidential commercial or financial data or trade secrets which are identifiable to a particular company, firm, or individual.

PART TWO: GENERAL QUESTIONS

I. What is the distinctive security interest of this Nation in maintaining secure petroleum supplies for the United States?

II. What would be the impact on domestic energy supplies of intensifying, reducing, or removing restrictions on oil imports?

III. What are the costs, including costs to ultimate consumers, and other detriments of achieving identified national security objectives by the present system of oil import controls?

IV. What practicable alternative means might be employed, other than import restrictions, to achieve identified national security objectives, and what would be the costs and other detriments of any such alternative means?

V. If import restrictions are necessary to achieve identified national security objectives, what alternative methods might be employed, other than the present quota system, and what would be the costs and other detriments of any such alternative methods?

VI. If an oil import quota system is to be maintained, how should it be implemented in the interests of efficiency and equity?

VII. If the present system of import controls were to be changed fundamentally or substantially, what transition steps would be necessary and appropriate to minimize disruption to affected persons?

VIII. What other significant and material issues should be considered by the Cabinet Task Force on Oil Import Control, and as to each such issue, what are the relative benefits and costs/detriments of the present system as compared with any suggested change?

PART THREE: DETAILED QUESTIONS

I. Security of supply.

1. How likely is it that a significant portion of foreign oil normally supplied to the United States and its allies will be disrupted for a significant period because of nuclear war, protracted limited war, brief or protracted conventional hostilities, or other serious interruption of supply?

2. In the event of such disruption, is it likely that this Nation's dependence

on foreign oil would limit its capacity for military action and/or negotiations? Is any such risk reduced or could it be reduced by storing military oil and products in forward theatre positions?

3. For each contingency, which foreign sources should be considered secure and to what extent? Are there domestic sources that should be considered insecure? That is, what domestic or foreign sources requiring sea transportation should we rely on? Should we rely on Canadian and Mexican overland imports?

4. Under which of the contingencies discussed above should the United States prepare for the petroleum needs of our allies? What arrangements now exist or should be made to meet those needs in a manner equitable to them and to the United States?

5. In the event of a serious interruption, to what extent would civilian demand be reduced as a result of price increases or rationing?

6. To what extent and with what speed could domestic production of crude oil be increased by drilling new wells on known reservoirs if required by a national emergency?

7. The following question should be answered under three alternative assumptions:

(1) That the present import control system is maintained indefinitely; or

(2) That overseas imports (other than residual fuel oil) have been doubled, and that the oil industry has adapted itself to the higher import level; or

(3) That overseas imports (other than residual fuel oil) have been quadrupled, and that the oil industry has had time to adapt itself to that import level.

How would your particular organization deal with the difficulties resulting from a sudden curtailment of overseas imports, and what means of adjustment could it find:

(a) If such imports were reduced (i) 50 percent or (ii) 100 percent; and

(b) If the curtailment were expected to last (i) for 6 months or (ii) for several years and perhaps indefinitely?

How would you suggest that the Nation deal with such emergencies?

8. If present import levels of residual fuel oil were suddenly discontinued completely for an indefinite period, how would your organization deal with the resulting difficulties, if any?

9. How and to what extent does the national security interest require the maintenance of an emergency reserve domestic production capacity? Over how long a period would full deliverability from this capacity be required? What transportation and refining capacity must be available to handle such supplies and where should it be located?

10. If a reserve production capacity is needed to meet emergency situations, should its size be determined by the Federal Government? Should its use be under the control, direct or indirect, of the Federal Government?

11. Is the location and design of U.S. domestic pipeline and refinery capacity such that it is presently capable of a sudden shift to exclusively domestic or North American overland supplies? If our dependence on foreign supplies were greater, could the resultant pipeline and refinery capacity adjust readily to an emergency shift back to greater domestic supplies (if available)?

12. In what ways, if any, would the Nation's dependence on overseas imports of residual fuel oil or other heating oil be more critical or less critical than any dependence on overseas imports of crude oil and oil products?

13. Are the dangers of interruption of overseas imports greater for oil than for other strategic materials for which we are more dependent on foreign supplies?

14. Do import restrictions conserve domestic reserves for possible emergency use? Do they encourage domestic exploration and thus discovery of significant new reserves sufficient to offset the additional depletion of domestic reserves caused by the substitution of domestic production for imports? Do they have effects on conservation and exploration in District V different from those in Districts I–IV?

II. Effect on domestic energy supplies of altered import control.

A. Supplies, prices, and imports.

15. What is your estimate of the supplies of crude oil likely to become available in the world outside Communist China, the Soviet Union, and other members of the Warsaw Pact:

(a) Production of crude oil, by major supply areas, 1970, 1975, and 1980;

(b) Spare productive capacity, by major supply areas, 1970, 1975, and 1980;

(c) Proved reserves of crude oil, by major supply areas, 1970, 1975, and 1980?

(Production, and productive capacity and proved reserves in the United States should be included as a major supply area; assume that present import restrictions continue through 1980. Exports from the Soviet Union to the non-Communist world, if any, should be estimated and included as a separate item.)

16. What is your estimate of the final consumption demand for crude oil and equivalent products in the world outside the Communist bloc in 1970, 1975, and 1980? Estimate by major market areas:

(a) Western Europe;
(b) Japan;
(c) Other Asia and Africa;
(d) United States;
(e) Other North America;
(f) Australia—New Zealand;
(g) South America;

(NOTE: Use crude-oil equivalent barrels for product demands. As in question 15, assume that present import restrictions in the United States continue through 1980.)

17. With respect to the above and similar questions, how reliable are the statistical estimates of proved reserves, ultimate reserves, productive capacity, maximum efficient rate of production, and deliverability?

18. If all import controls were removed, what would be the probable flow of petroleum and oil products into the United States by volume and as a percentage of domestic production—within 1 year; 5 years (1975); 10 years (1980)?

(a) What would be the effect on world oil prices? On "royalty" payments charged by foreign governments and others?

(b) To what extent, and for how long, would imports be inhibited by the cost of diverting or adding tankers? By the cost of constructing new deepwater terminals and refinery capacity? By pipeline capacity and/or the cost of converting product lines to reverse flow when appropriate?

(c) To what extent would imports be inhibited by the interest, if any, of the integrated major international oil companies in maintaining a domestic market for the output of their domestic wells even if the delivered cost of foreign oil is lower than that of such domestic output?

(d) What would be the effect on domestic oil prices?

19. What are the delivered costs of foreign crude oil and oil products, by types and grades, imported into the United States, by principal supply area and by principal points of delivery, and what are the main elements in those costs? What were those costs in 1955, 1960, 1965, and 1968? What would the cost be in 1975? 1980?

20. What is the average delivered cost of domestic oil and bulk oil products in the United States, by types and grades, by principal production area and market area, and what are the main elements in these costs (include data for most recent period available):

Well head costs, per barrel:
  Exploration costs, including lease costs.
  Drilling and equipment costs.
  Production costs, including royalties.
Transportation costs (crude), including gathering cost.
Refining costs.
Transportation costs (products) to bulk terminals.
Specify taxes per barrel as a separate element.

Use as the sample production areas:

Louisiana—Texas Gulf Coast, including offshore.
Mid-Continent.
Permian Basin—West Texas.
California.
Southern Alaska.

Use as sample marketing areas:

New England.
Middle Atlantic.
Great Lakes: Chicago-Cleveland.
Seattle.
Los Angeles.
Hawaii.
Texas Gulf Coast, including points of transshipment.

B. *Domestic petroleum production and exploration.*

21. Taking account of what is known about the array of costs of production from most efficient (lowest cost) pools to the least efficient, what would be the annual volume of oil produced in the United States in the immediate future at the following average wellhead prices (assume that each pool is restricted only to its maximum efficient rate of production (MER) and that producers expect both the market price and money costs of labor and equipment to remain the same for an extended period of 10 years or so).

Per Barrel	
$10.00	$3.00
5.00	2.50
4.00	2.00
3.50	1.50

What would be the effect of these prices on available supply over time? Would the expected annual production at that price remain constant for the next 5 or 10 years, or would it increase

or decrease and if so by how much, i.e., along what path?

(If estimates of production from North Alaska are made, they should be given separately and not mingled with the rest.)

22. Under existing production controls and prorationing systems, what is the array of wellhead costs of oil in the United States, from marginal wells to the most efficient pools? Can you estimate how much oil is produced under high-cost, median-cost, and low-cost conditions this year, indicating your own measures of these cost brackets? If your organization produces oil, how is that production distributed among these cost categories?

23. Would unrestricted imports tend to bring U.S. oil prices into closer parity with prevailing prices in other markets? Would such changed U.S. prices make unprofitable and thus discourage domestic exploration? If so:

(a) To what extent do significant discoveries result from existing exploration efforts motivated by the prospects of finding marginal reserves or supported from the profits of marginal operations?

(b) Would there be significantly less exploration for substantial discoveries such as those indicated in offshore areas or in Alaska? Or would such activity be undertaken even at world market prices?

(c) Might such exploration be encouraged by a relaxation of domestic production controls, if any, that inhibit efficient production at substantial pools? Would such relaxation tend to occur if import restrictions were reduced or removed?

Provide the same information with respect to effects on development of known domestic fields.

24. If production controls were relaxed, would domestic production increase or decrease?

(a) If imports continued at present levels; and

(b) If imports were unrestricted?

What would be the effect on ultimate recovery?

25. To what extent and in what manner do the answers to the two preceding questions vary in acordance with the following alternative sets of assumptions:

(a) State proration and conservation controls remain as at present or are changed so as to bring about reservoir production at maximum efficient rates;

(b) The present U.S. Federal and State tax incentives for exploration and production (expensing "intangible" drilling costs, depletion allowance, foreign tax credit) remain in effect or are substantially altered;

(c) Costs of labor and materials remain as at present or are materially increased;

(d) The technology of production, refining, and delivery remain as it is or becomes substantially more efficient;

(e) The need for conservation of domestic reserves remains as it is, becomes more acute, or is significantly relaxed?

(f) Prices of foreign crude increase substantially because of higher tax or royalty payments abroad or decrease because of increased competition?

26. What are the effects of Federal exploration, mineral leasing, royalty, and production control policies on the efficiency of the domestic petroleum industry? What are the corresponding consequences of State regulation? To what extent could domestic competitiveness be improved by specific changes in these policies?

27. What are the effects of U.S. maritime regulations (the Jones Act) on the competitiveness of domestic oil in U.S. markets? To what extent could any adverse consequences be reduced by specific changes in such regulation?

C. Impact on energy consumers and on related industries.

28. Assuming unrestricted imports have the effect of bringing U.S. oil prices into relative parity with prevailing prices in other markets, what would be the potential annual direct cost saving to domestic oil consumers, and how much of any such saving would in fact be reflected in domestic market prices? Please group the data according to principal market areas and in the following categories: Utilities; petrochemical production; other manufacturing; commercial operations; State or local government; households; automobile-driving public; and other transport?

29. What would be the annual budgetary saving to the Department of Defense and to other Federal agencies?

30. What would be the effect of unrestricted oil imports on existing and future international transportation facilities and marine transportation costs?

31. How would economic structures and economic interests associated with special quota allocations and foreign trade zones be affected by tightening, reducing, or eliminating oil import controls?

32. What would be the effect of unrestricted imports on the development of U.S. internal oil transportation capacity—e.g., pipelines, coastwise shipping, tank trucks and tank cars, barges, Great Lakes shipping, etc.?

D. Foreign relations and balance of trade and payments.

33. What would be the impact on our relations with each of the major oil producing nations outside Communist China, the Soviet Union, and other members of the Warsaw Pact, of tightening, reducing, or eliminating oil import controls?

34. Does the present import quota system result in lower or higher world oil prices for industrial competitors in other countries than they would otherwise have to pay?

(a) How would the international price of oil be affected by enlargement of U.S. import quotas?

(b) Can the modification or elimination of oil import quotas be so arranged as to result in equalization of the United States with the world price of oil?

35. What is the best estimate of the annual dollar outflow, if any, currently and after 5 years, for imports of goods whose cost of production is affected by oil prices and whose delivered price advantage over the same or similar U.S.-manufactured goods (e.g., petrochemicals) may be significantly affected by the differential between current U.S. oil prices and prevailing world market prices?

36. What is the best estimate of the annual dollar loss, if any, currently and after 5 years, occasioned by inability to export such goods from the United States for similar reasons?

37. To what extent has or could the creation of special quota allocations or foreign trade zones eliminate any problems exposed by the preceding two questions? By what criteria are or should such exceptions or zones be created?

38. How and to what extent would increased oil imports and related U.S. investment abroad affect the U.S. balance of trade and payments in the short and long terms? What proportion of all U.S. expenditures for foreign oil, including related U.S. investment abroad, is returned to the United States in the form of company remittances or net purchases of U.S. goods for Canada, Venezuela, other Western Hemisphere producers, Eastern Hemisphere producers?

39. What would be the answer to the preceding question if present import controls were continued with the exception that imports of petrochemical feedstocks would be unrestricted.

40. By what annual dollar amounts are domestic percentage depletion deductions increased as a result of the maintenance of domestic petroleum prices at levels which are higher than would be reached in the absence of oil import quotas? What is the estimated annual dollar amount of the resulting tax losses?

41. What is the rationale for granting special U.S. tax benefits to foreign petroleum production, including royalty payments, percentage depletion, and the expensing of intangible drilling and development costs when imports of foreign oil are restricted by quota? What is the estimated annual dollar amount of the U.S. tax loss (a) attributable to the allowance of percentage depletion with respect to foreign production; (b) attributable to the expensing of foreign intangible drilling and development costs?

E. Implications of Alaskan and other North American discoveries.

42. As regards recent and apparently large oil discoveries in Alaska and possible additional discoveries elsewhere on the North American continent, what reasonable estimates are now possible about the following questions:

(a) The size of the several oil pools discovered;

(b) The per barrel cost of exploration, development, and extraction from those pools; and

(c) The costs of delivery of oil extracted from those wells:

(i) To the principal potential market areas in the United States:

(ii) To noncontiguous States and territories; and

(iii) To foreign nations.

43. What are the estimates of oil on the continental shelf of the United States up to 200 meters depth? What are the estimates for the shelf in waters deeper than 200 meters but less than 2,500 meters?

44. How accurate are the above estimates either in detail or in order of magnitude? When are such estimates likely to become substantially more accurate?

45. What is the probable course of development of the fields discussed in question 42? How does the answer vary if

import quotas are maintained, tightened, relaxed, or removed? To what extent and how rapidly could the delivered output from such fields be increased in the event of urgent national need for production?

46. What will be the impact of these large discoveries on the remainder of the domestic industry? Will prorationing in the Southwest be curtailed or eliminated? Will U.S. prices be reduced? Will domestic reserves to production ratio be increased for the next decade?

F. Petroleum demand: Alternative energy sources.

47. What is the price elasticity of domestic demand for crude oil and its principal products?

48. Are actual or prospective Federal or State air pollution controls likely to induce significant shifts toward low-sulphur crude for heating or energy purposes? If so, to what degree and from foreign or domestic sources? If such crude is not available in adequate quantities, would sulphur extraction technology or other domestic energy sources be available?

49. Are changes in automobile consumption of gasoline likely to reduce the future demand for gasoline and if so, to what extent?

50. What practicable substitutes for petroleum are now or are likely to become important? What new technological developments or production plans do you know of in the field of petroleum substitutes? What share of the domestic energy market, and specifically, how much of petroleum's present market, would go to such substitutes by 1975 (1980)

(a) If the price of oil remains the same in the United States?

(b) If the price of oil rises by 30 percent? By 15 percent?

(c) If the price of oil falls by 30 percent? By 15 percent?

(Treat natural gas as a petroleum substitute, and indicate what projections you make of the price of natural gas and of other substitutes.)

51. What is the probable course of development of domestic oil shale? Would such development be accelerated or impeded if import quotas are maintained, tightened, relaxed, or removed? To what extent could such development be accelerated in the event of urgent national need for production? What are the best estimates of the unit cost of oil refined from domestic oil-shales under efficient and possible conditions of production by 1975? By 1980?

52. What is the probable course of development of oil from coal? Would such development be accelerated or impeded if import quotas are maintained, tightened, realized, or removed? To what extent could such development be accelerated in the event of urgent national need for production? What are the best estimates of the unit cost of oil from coal under efficient and possible conditions of production by 1975? By 1980?

53. To what extent does the cost of converting industrial, municipal, and household facilities from the use of petroleum to the use of alternative sources of energy operate as a barrier to such conversion?

54. Assuming that unrestricted oil imports have the effect of bringing U.S. prices into relative parity with prevailing prices in other markets, to what extent would this reduce the domestic demand for natural gas for heating and power generation purposes?

55. If domestic oil production declined, would natural gas production decline significantly? If domestic oil exploration is reduced, would natural gas discoveries in the United States diminish proportionately? How is the answer to this question affected by the answers to question 67?

III. Costs and Other Detriments of the Present Quota System

56. What portion of the annual cost to consumers and to defense expenditures (see questions 28, 29) represents payments to producers attributable to the quota system as such? To State or local governments?

57. To what extent does the present system of State production controls lead to excess capacity, excessive drilling, or failure to achieve lowest-cost production from efficient pools? Do import controls have any bearing on the effects of State production controls?

58. If the effect of any changes that might be made in oil import controls were to remove or reduce the economic rationale for State production controls, are there any Federal or interstate laws or programs that should be reviewed, and if so, what are they and what should be the outcome of such a review?

59. How does the present system of import control affect the efficiency and structure of the producing, refining, transportation, and marketing segments of the domestic petroleum industry? How, and to what extent, if at all, do world prices presently affect domestic exploration, production, and development? What would be the impact of tightening, relaxing, or eliminating such control?

60. What are the public and private costs and inefficiencies of administering the present quota system?

61. What is the impact on the import, export, and other operations of domestic petrochemical producers—and of other industries for which oil is a significant direct or indirect input—both now and in the future?

62. What is the effect of the present quota system on Venezuela, Mexico, and other Western Hemisphere countries; developing countries elsewhere; other countries generally?

63. How do present formal or informal controls on Canadian oil exports to the United States affect the economic and political relations between Canada and the United States?

64. Does the present system of oil import control affect the opportunities for U.S. exports of other products? How and to what extent? Consider petrochemical products in particular.

65. What is the likely effect of U.S. oil import controls—in present or altered form—on the developing energy policy of the European Common Market?

IV. Alternatives to import controls.

66. As regards each of the non-import-restricting alternatives (listed below in question 67), what would be its relative benefits and costs/detriments as compared to the present quota system in terms of:

(a) Contribution to national and allied security?

(b) Delivered prices of oil and oil products to U.S. consumers, by major market areas and by categories of consumers?

(c) The short-, medium-, and long-term effects on oil exploration and production in the United States, by major area of production, both inland and offshore, and by category of producer?

(d) Development of alternative sources of energy?

(e) Administrative inefficiencies and direct budgetary costs?

(f) Realization of effective competition within domestic oil markets?

(g) Effect on related industries and occupations?

(h) Effect on the U.S. balance of trade and payments, including in particular the import and export operations of domestic petrochemical producers?

(i) International political and economic repercussions including effect on GATT and other international trade commitments?

67. Among non-import-restricting alternatives that might be considered are the following. As to each of these alternatives, consider also what transition steps would be necessary and appropriate to minimize disruption to affected persons.

(a) Direct Government subsidies or bounty for domestic drilling or discovery.

(b) Direct Government drilling or special incentives for the creation and capping of inland and offshore wells to serve as a strategic oil reserve.

(c) Aboveground or underground storage by the Government or through special incentives.

(d) Development of adequate reserves of shale oil or synthetic fuel, technology or standby capacity, either by (i) direct Government operation; (ii) incentives or subsidies to private industry; or (iii) some form of mixed operation.

(e) Changes in U.S. tax laws that provide an incentive to produce abroad.

(f) Changes in Federal lands leasing policies.

(g) Other, non-import-restricting alternatives that may be suggested.

68. What are the most economical means of assuring the location of transportation and refinery capacity in the right places and with the right processes for a sudden shift of, say, 6- or 12-month duration to exclusively domestic or North American overland shipments of crude oil if made necessary by a national emergency? What would be the cost of such measures?

V. Nonquota import controls.

69. What nonquota trade controls or other Government programs have been employed by the United States and other countries to preserve the security of supply of strategic commodities such as oil?

70. As an alternative to import restrictions by means of quota, consideration might be given to the adoption of protective tariffs with or without special provision for North American or Western

Hemisphere sources. What specific levels of tariffs would be protective? Assess the relative benefits and costs/detriments of this or any other nonquota alternative that may be proposed, in terms of the factors listed under question 66.

71. What would be the advantages and disadvantages to the United States of a North American common market for energy or a Western Hemisphere common market for energy?

VI. Administering a quota system.

72. By what criteria should quota levels be set and how often and by what means should these be adjusted to conform to changing circumstances?

73. Should quotas be allocated as to sources, either globally or by country of origin?

74. Should overland imports be within or outside the quota?

75. How should import licenses be allocated among possible recipients—by existing methods, by auction, or by some other means? Should sale of import allocations be permitted in addition to or in place of exchanges?

76. Is there need for separate treatment for District V in the future?

77. Should any special treatment be afforded to consuming interests in the noncontiguous States and territories or in economically depressed regions? To consuming industries suffering competitive disadvantage? To consumers of residual or heating oil? To others manifesting a clear need for such special treatment?

78. Should broader preference be granted to low-sulphur imports in the interest of air pollution control?

79. What other problems of definition and application of the present quota system exist and how should these be resolved?

80. What are the relevant points of contrast and comparison between the oil import quota system as presently administered and other raw material quota systems presently or previously adopted by the United States, e.g., for lead and zinc, sugar, cotton textiles, and others?

81. As to each suggested change in implementation of the present quota system, please assess the factors listed under question 66 above.

82. As to each such change, please also describe with particularity the proposed means of alteration of the present system and the legal authority for such alteration.

GEORGE P. SCHULTZ,
Secretary of Labor.

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TASK FORCE ASSIGNMENTS
OF
TECHNICAL SUBCOMMITTEE TO
NPC COMMITTEE ON U.S. PETROLEUM IMPORTS
June 30, 1969

GROUP NO.	CHAIRMAN	TASK FORCE MEMBERS	SPECIFIC ASSIGNMENT
1	Cecil J. Olmstead Texaco Inc.	Messrs. Dempster, Lichtblau, Olsen and Whealy	Questions 7, 8 and 14
2	S. E. Watterson, Jr. SoCal	Messrs. Emerson and Goad	Questions 15 and 19
3	R. W. Dotson Cities Service	Messrs. Butler, Chrislip and Dumbros	Questions 20, 21 and 22
4	Robert E. Geiger Mobil Oil	Messrs. Field and Vige	Question 25(a)
5	William T. Slick Humble Oil	D. W. Graham	Question 42
6	W. E. McGinnity Std. of Indiana	Messrs. Creek and McCreary	Questions 51, 52, 53 and 55
7	James E. Arnold Phillips	Messrs. Davis, Jameson and Rackley	Introduction Chapter on Natl. Security

PETROLEUM POLICIES FOR THE UNITED STATES

March 1, 1966

A Report by the
National Petroleum Council's
Committee on National Oil Policy
D. A. McGee, Chairman

NATIONAL PETROLEUM COUNCIL

(Established by the Secretary of the Interior)

March 1, 1966

1625 K Street, N. W.
Washington, D. C. 20006

My dear Mr. Secretary:

Pursuant to the formal request by the Department of the Interior that the National Petroleum Council restudy "A National Oil Policy for the United States" submitted in 1949, I have the honor to transmit to you herewith a report entitled "Petroleum Policies for the United States" prepared by the National Oil Policy Committee and approved by the National Petroleum Council.

The present report takes into account many developments since 1948. Notable among these are the following: (1) the shift from rapidly increasing demand and a tight supply situation to a much slower rate of growth and ample supply; (2) the greater role of petroleum as a source of energy in the United States; (3) the rapid growth in use of natural gas and gas liquids until these fuels now supply as much energy as crude oil; (4) the competitive pressures on domestic petroleum resulting from the tremendous expansion in reserves and production of foreign oil; and (5) a decision of the Supreme Court in 1954 that the provisions of the Natural Gas Act of 1938 apply to producers selling gas to interstate pipelines.

The developments listed above and other factors have contributed to significant changes deserving consideration. Domestic exploration and drilling for petroleum have declined substantially since 1956. Currently available spare capacity to produce crude oil has increased, but at the same time the ratio of proved domestic reserves of oil and gas to annual production and consumption has declined. Imports have increased steadily to the point that they now supply about twenty per cent of the oil consumed in the United States. Controls on petroleum imports have been imposed on a voluntary basis since 1955, and under a mandatory program since 1959. The price for gas sold by producers to interstate pipelines is now being regulated by the Federal Power Commission.

Developments of the nature summarized above make your request for a review of petroleum policies very timely and appropriate. The Council welcomes the opportunity provided by your request to present its considered judgment on the principles and policies designed to assure for the nation a healthy, expanding domestic petroleum industry capable of continuing to play a major role in meeting increasing requirements for the future. We believe that these policies deserve general support and recommend implementation by industry and by all levels of government.

Respectfully submitted,

Jake L. Hamon

Jake L. Hamon, Chairman

Honorable Stewart L. Udall
Secretary of the Interior
Washington, D. C.

PETROLEUM POLICIES FOR THE UNITED STATES

I. INTRODUCTION

Long standing national interest in petroleum affairs reflects appreciation of many important factors. Outstanding among these are the strategic role of oil and gas for national security, the need for conservation of resources, and the vital contribution of petroleum in promoting economic progress.

Interest in petroleum policies has been stimulated in recent years by several developments. One of these, the high degree to which the United States relies on petroleum as a source of energy, reflects a long-term trend. Oil and gas now supply about three-fourths of the mineral fuels used in the United States, compared with about one-half in 1947 and about one-quarter in 1926. The impact of this change is evident in every aspect of American life, not only in transportation but also in agriculture, industry, and the home. More recently, the Federal government has become more deeply involved in oil through controls over imports and in gas through regulation of the prices at which producers sell gas to interstate pipelines. Also, as the owner of offshore leases on the Continental Shelf and of the largest acreage of shale lands, the Federal government must make decisions which will affect the development of domestic energy resources.

The preceding developments, as well as other changes which have occurred since the National Petroleum Council last formulated its statement of "A National Oil Policy for the United States," make timely a review of the broad Federal and state policies concerning petroleum that have developed through the years. Such review should serve a useful purpose by providing perspective and guidance as to sound policies for the years ahead until such time as unforeseen major developments require another review. Accordingly, this statement endeavors to summarize the objectives and key elements of sound policies for the United States with respect to crude oil, natural gas, and liquid and gaseous fuels that may be extracted from shales, tar sands, and coal, and with respect to all phases of petroleum operations from exploration through marketing.

II. BASIC OBJECTIVE AND PRINCIPLES

THE FUNDAMENTAL OBJECTIVE OF PUBLIC POLICIES DEALING SEPARATELY WITH PETROLEUM SHOULD BE TO SERVE THE GENERAL WELFARE BY (1) ASSURING ADEQUATE SUPPLIES OF OIL AND GAS FOR NATIONAL SECURITY, (2) ENCOURAGING AMPLE SUPPLIES AT REASONABLE PRICES FOR ECONOMIC PROGRESS, AND (3) PROMOTING EFFICIENCY IN ALL OPERATIONS.

Two major principles should govern petroleum policies. First, private competitive enterprise should be relied upon and encouraged in all situations in which it can and does function effectively. In this business, as in most others, diversity of investment and effort best serves the public. Second, governmental regulations required for reasons of national security and conservation should interfere as little as possible with normal competitive forces that encourage efficient operations. If government regulations must be imposed, they should provide uniform and equitable treatment.

III. MAJOR POLICIES

The major elements of policies required to achieve the basic objective are set forth in the following sections.

1. National Security

A HEALTHY AND EXPANDING DOMESTIC PETROLEUM INDUSTRY CONTINUES TO BE ESSENTIAL TO THE SECURITY OF THE UNITED STATES AND TO THE DEFENSE OF THE FREE WORLD.

The essential role of petroleum for industrial and military strength has been demonstrated repeatedly in every national emergency. Nuclear weapons have not reduced the importance of petroleum. Liquid fuels provide the mobility for American military power that serves to deter and limit aggressive actions. In the event of destructive nuclear warfare, petroleum would be essential for rapid recovery by the remaining population. In peacetime, oil and gas promote greater productivity and better living standards. Therefore, petroleum retains the utmost significance.

A domestic industry capable of delivering substantial additional supplies of petroleum and products on short notice is a major asset to the United States and to Allies heavily dependent on oil imports. In the absence of readily available alternate supplies, interruption of the flow of oil in international commerce, whether due to military action or to other circumstances, could have very serious consequences. Supplies from domestic petroleum operations have the advantage of being most dependable and least subject to interruption of delivery for use in the United States.

Domestic resources are not the only basis of national security, however. In an age of global involvement, security is a complex matter including many international considerations relating to trade and to mutual security. Participation by United States nationals in foreign petroleum operations contributes to the security of the Free World. In many circumstances, foreign oil serves the defense needs of the Free World best because of favorable location. The strength and friendship of Allies must also be taken into account.

National policies reflect consideration of both domestic and international factors bearing on security. In addition, purchases of petroleum products by the Federal government both here and abroad should be made in a manner designed to strengthen national security.

2. Imports

NATIONAL SECURITY AND ASSURANCE OF ADEQUATE LONG-RUN SUPPLIES AT REASONABLE COST FOR CONSUMERS REQUIRE LIMITING TOTAL PETROLEUM IMPORTS, INCLUDING PRODUCTS, TO A LEVEL WHICH WILL PROVIDE OPPORTUNITY FOR AND ENCOURAGE EXPANSION OF ALL PHASES OF DOMESTIC PETROLEUM OPERATIONS IN KEEPING WITH INCREASING DEMANDS INSOFAR AS PRACTICABLE.

Rapid expansion of petroleum imports after World War II and the substantial decline in domestic exploration and drilling since 1956 led the United States to impose mandatory import controls in 1959 in an effort to maintain a healthy domestic industry capable of serving the needs of national security. In regulating imports, government officials must take into account many different factors, often conflicting in nature, in deciding on programs best suited to serve national interests. These programs should apply uniformly and equitably to all parties, and should be designed to interfere as little as possible with normal economic forces and with competitive relationships. Government agencies engaged in importing petroleum should continue to be subject to import controls.

Import policies should be sufficiently definite to provide useful guidance in planning but should be flexible enough to permit reasonably prompt adjustment to significant changes in conditions. Programs implementing such policies should be reviewed at reasonable intervals to determine whether they can be improved to serve the national interest more effectively.

3. Foreign Petroleum Operations

THE UNITED STATES SHOULD SUPPORT EQUAL OPPORTUNITY FOR ITS NATIONALS TO PARTICIPATE IN WORLD PETROLEUM OPERATIONS, AND SHOULD SUPPORT THE RIGHTS OF ITS CITIZENS TO FAIR TREATMENT IN THEIR OPERATIONS ABROAD.

Participation in foreign petroleum operations by nationals of the United States is important not only to the progress and strength of the Free World but also to the security of the United States. Such participation deserves support by national policies which encourage the free flow of capital in world markets and which oppose violation of agreements and any other form of unfair or discriminatory treatment.

The use of petroleum for political purposes to undermine security in the Free World should be opposed. Whenever such danger develops, the United States should consult with the governments and interests affected to determine what action may be useful in countering such threat.

4. Conservation

STATE LAWS TO PREVENT WASTE, TO CONTROL POLLUTION, AND TO PROTECT CORRELATIVE RIGHTS ARE NECESSARY AND DESIRABLE, ARE THE APPROPRIATE WAY TO DEAL WITH DIVERSE LOCAL CONDITIONS, AND SHOULD CONTINUE TO BE REVISED IN KEEPING WITH IMPROVED KNOWLEDGE.

In order to conserve resources and to promote equity, the principal producing states have developed various regulatory controls over drilling and production. These controls have helped to increase recovery of oil and to eliminate substantial unnecessary costs. They have been improved over the years in keeping with better engineering knowledge, particularly in the past few years, to encourage efficient development and better operating practices. Each state should continue to examine and improve its conservation laws and regulations.

Because of widely varying local conditions, conservation regulations are best carried out by the states. The Federal government has supported state action through authorization of an Interstate Compact and through other measures. In keeping with this policy, productive Federal leases should be governed by the same rules in effect for adjoining public and private lands, as is customarily the case now.

Unit operation of pools should continue to be favored as a means of reducing costs and increasing recovery. These operations are increasing both under voluntary agreement and under state laws calling for unitization on a reasonable basis which protects the interests of all parties when the owners of a high percentage of the interests in a field agree on the need for such action. Unit operations should be under state jurisdiction because of widely varying local conditions.

The petroleum industry and state agencies have taken many steps through the years to control water and air pollution. Cooperative efforts and appropriate research designed to achieve clean water and air should be accelerated.

5. Natural Gas Supply

FEDERAL POLICIES SHOULD ENCOURAGE DEVELOPMENT OF NEW GAS SUPPLIES SUFFICIENT TO KEEP PACE WITH GROWING NEEDS, AND SHOULD AVOID CONTROLS AND UNCERTAINTY WHICH INTERFERE WITH THAT GOAL.

A decision of the Supreme Court in 1954 held that the Natural Gas Act of 1938, designed to regulate interstate gas pipelines, required the Federal Power Commission to control prices at which producers sell gas to interstate pipelines. The Commission found that the cost of service standards applied to pipelines are not appropriate for producers. It has tried a number of approaches in an effort to devise satisfactory regulatory standards by administrative action. However, no regulatory definition of standards can take the place of clearly defined legislative standards.

During the prolonged and expensive effort to define regulatory standards by administrative action, the ratio of proved reserves of gas to current production and consumption has declined. Continuation of this decline would be cause for concern about the adequacy of domestic gas supplies for the future. It seems likely that a substantial increase in the rate of development of new gas resources will be required shortly to meet rising demands.

Legislation removing Federal regulatory confusion and uncertainty as to what prices producers can count on receiving from sales of gas to interstate pipelines is an essential step toward encouraging greater development of gas in order to serve consumers adequately in the future.

6. Competition

NATIONAL POLICIES SHOULD ENCOURAGE COMPETITION AMONG ENERGY SOURCES IN THE UNITED STATES AND DIVERSITY OF EFFORT BY MANY INDIVIDUALS AND FIRMS IN ALL FACETS OF PETROLEUM OPERATIONS.

Interfuel competition has been of great benefit to the nation in providing ample supplies of energy at reasonable prices. In a competitive market, price functions effectively as a regulator of supply and demand and as a means of determining the proper economic use of available fuels. Interference with competitively determined prices or with the freedom of customers to use the fuels they prefer imposes undesirable burdens on consumers and producers of energy.

Restrictions on the end use of oil or gas because of concern over long-term availability are not warranted. Many adjustments have occurred and will continue to occur in the use of fuels and in sources of supply in response to normal economic forces. The present substantial flexibility in the use of fuels will become greater in the future. The rising importance of electricity will further intensify competition that is already keen among coal, oil, and gas as a means of generating power. Atomic energy provides still another alternate.

The place of different fuels in the market should not be distorted by government expenditures either on development favoring one form of energy over others or on facilities which will compete with private investments. The pace at which new resources should be developed can be determined best by normal economic considerations under the forces of interfuel competition. Private investments are also being made on tar sands, shales and coal which may open up vast new sources of liquid and gaseous fuels.

Diversity of effort by thousands of individuals and firms in all phases of the business from exploration to marketing has served American consumers well. This diversity contributes to innovation, improvement, and competition. It results from an economic climate providing encouragement for private investment by all operators, from small to large.

The advantages of diversified effort have been particularly apparent in the search for new petroleum supplies. The chances of locating oil and gas improve as more people are encouraged to venture private capital on their own initiative.

Antitrust laws have a role in maintaining diversity of effort. Certain phases of the business require many large aggregations of capital, however, so that size should not be the basis for denying any company the right to grow so long as it remains competitive with numerous other firms.

7. Taxation

LONG-ESTABLISHED DIFFERENTIAL TAX PROVISIONS, SUCH AS THOSE DEALING WITH DEPLETION AND WITH INTANGIBLE DRILLING COSTS, SERVE THE PUBLIC INTEREST IN ECONOMIC PROGRESS AND SECURITY BY ENCOURAGING DEVELOPMENT OF PETROLEUM SUPPLIES AND SHOULD BE CONTINUED THROUGHOUT THE EXTRACTIVE PETROLEUM INDUSTRIES.

The United States has maintained differential tax provisions for petroleum and for minerals in general since income taxes were first introduced.

These provisions take into account such factors as the unusual risks encountered in exploration, the need for commensurate rewards in case of success, and the problems involved in replacing the reserves and values depleted by production. They have served to attract capital into exploration and to stimulate greater discovery and development of petroleum resources. As a result, ample petroleum supplies at reasonable prices have contributed greatly to economic growth and national security.

Since undiscovered oil and gas are of no benefit whatever, the promotion of new petroleum discoveries should be a key element of national policies. Continuing encouragement of private exploration efforts at home and abroad is essential in order to supply the increasing quantities of petroleum needed for better standards of living and for security. Therefore, the long-established differential tax provisions which have become part of the economic structure of the industry, to the great benefit of consumers and the nation, should be continued in effect for all petroleum sources.

8. Development of Public Lands

FEDERAL AND STATE PUBLIC LANDS, INCLUDING SHALE LANDS, SHOULD BE MADE AVAILABLE IN AN ORDERLY MANNER FOR PRIVATE DEVELOPMENT UNDER THE MULTIPLE USE CONCEPT IN ORDER TO ENCOURAGE TESTING AND DEVELOPMENT OF NEW ENERGY RESOURCES.

In recent years public lands, particularly on the Continental Shelf, have become an increasingly important source of petroleum. Unleased public lands appear to have considerable potential for future development of oil and gas. In addition, the Federal government is by far the dominant owner of shale lands that may become economic sources for liquid fuels. As sufficient interest develops in leasing public lands, the Federal government and the states should make them available for private exploration and development in order not to retard the commercial utilization of valuable resources. These lands should be made available in such manner that their development will permit introduction of new supplies into the market in an orderly way.

9. Government Research

FEDERAL EXPENDITURES ON ENERGY RESEARCH SHOULD BE RESTRICTED SO THAT THEY DO NOT DISCOURAGE OR ENCROACH ON PRIVATE RESEARCH OR INTERFERE WITH MARKET COMPETITION BETWEEN THE VARIOUS FORMS OF ENERGY.

Private expenditures on energy research and technology are extensive and serve the needs of an expanding economy under the effective guidance of the profit motive and the protection of the patent system. Therefore, government research expenditures should be limited to fundamental studies, such as those designed to advance the frontiers of knowledge and to surveys of potential resources.

10. Industry-Government Cooperation

INDUSTRY AND GOVERNMENT SHOULD CONTINUE PROGRAMS FOR CONSULTATION AND COOPERATION IN THE ANALYSIS OF PETROLEUM MATTERS OF PUBLIC CONCERN.

The petroleum industry has cooperated with state conservation agencies, with Federal officials, with Congressional committees, and with others on many studies. Constructive cooperation of this kind is useful and should be continued through established channels of communication between government and industry.

The needs of the Federal government for petroleum statistics should be discussed with industry to determine the extent to which meaningful information can be provided for useful purposes and how the requirements can be met without undue expense to the government and to industry. The wealth of information which is already provided by industry and by state and Federal agencies should be fully considered.

Information on reserves should be developed as needed, taking proper care to distinguish between fact and speculation.

IV. CONCLUSION

The preceding policies, properly implemented and observed by industry and government, will provide the basic foundation on which private enterprise can build the innumerable activities required to assure adequate supplies of petroleum and of all forms of energy for the future.

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

C
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P
Y

January 12, 1965

Dear Mr. Hamon:

In January 1949, the National Petroleum Council submitted to the Secretary of the Interior a report entitled "A National Oil Policy for the United States." This report was based upon a comprehensive study of the many elements and broad principles that underlie such a policy and that must be appropriately interpreted by national and state governments as well as by leaders of the industry in order to attain optimum results.

It is obvious to all of us that fundamental changes have occurred since 1949 affecting to a critical degree broad strategic, economic and political aspects of the industry and the interest of government in it, both domestic and foreign.

We can agree, I feel sure, that changes have tended to magnify the importance of the industry on all fronts and to promote its progressive involvement more deeply in the affairs of all nations.

This trend of events has required of this Government an increasing concern with and knowledge of your complex industry as it relates to the fundamentals of national security, and wellbeing in a broader economic and political sense.

It is requested, therefore, that the National Petroleum Council review in depth its earlier report and the factors related thereto and report its views based upon its appraisal of conditions as they are today and as they may be anticipated to evolve in the future, making available to this Department its considered judgments.

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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