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The development of deepwater ports in the United States has received much attention in recent years, primarily because of the increasing size of oil tankers and the country's increasing reliance on oil imports. Large tankers offer the most economical method for moving large volumes of crude oil over long distances. Because the United States does not have deepwater port facilities capable of handling the commonly used large tankers, oil must be transferred from large to smaller vessels before delivery. Findings/Conclusions: The expected need for an increase in the number of smaller tankers will create congestion and hazards of collision and oilspill. According to the Department of Commerce, offshore deepwater ports using pipelines to transport the oil would provide a safer alternative. Some deepwater ports are being planned off Louisiana and Texas, but no proposals for such ports are being considered for the mid-Atlantic areas. State and local governments have opposed the ports because of concerns about oilspills and secondary industrial growth and have questioned their economic feasibility because of poor prospects for much increase in refinery capacity. Judgments about the feasibility of a deepwater port on the Atlantic coast should be deferred until a definitive study is completed. Recommendations: The Secretary of Transportation, with the cooperation of other involved Secretaries, governments, and groups, should complete a mid-Atlantic deepwater port study by December 31, 1978, addressed to optimum location and number of ports, construction costs, potential for refined product use, procedures and legal arrangements, requirements for pollution control technology, and financing and management options. Within 6 months of completion of the study, the Secretary should submit a plan to the Congress identifying a program to construct and operate the port. If the study finds the port undesirable, he should report this finding

and present options. The Congress should schedule appropriate hearings on the study's results. The Congress should also enact legislation to expedite required Federal approvals of transportation systems to move surplus Alaskan crude oil to inland States. (HTW)

BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Potential For Deepwater Port Development In The United States

The economic and environmental advantages generally associated with deepwater ports and the expected continued U.S. reliance on large quantities of imported oil suggest that the development of a mid-Atlantic deepwater port may be in the national interest. It deserves attention at this time. Industry is planning to construct and operate deepwater ports off Louisiana and Texas.

GAO recommends that the Secretary of Transportation complete a study of the cost-effectiveness and feasibility of a mid-Atlantic deepwater port by December 31, 1978. The Secretary should also submit to the Congress a plan for the port's development unless the study finds that some other option is more desirable.

EMD-78-9

APRIL 5, 1978

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-178205

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the economic and environmental benefits of building deepwater ports. Recommendations are made to the Secretary of Transportation to study the feasibility of an east coast deepwater port and, if determined feasible, to prepare a plan for the Congress identifying how such a facility can be constructed. We recommended that the Congress hold hearings evaluating any deepwater port development plan submitted by the Secretary of Transportation and consider legislation designed to expedite construction of west-east pipelines needed to deliver surplus Alaskan crude oil to the Northern Tier and other inland States.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Acting Director, Office of Management and Budget; the Secretaries of Transportation, Energy, and Commerce; Governors of east coast, Gulf Coast and west coast States; Senators and Representatives of east coast, Gulf Coast, and west coast States; and the House and Senate committees and subcommittees having oversight responsibilities for the matters discussed in the report.

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

POTENTIAL FOR DEEPWATER PORT DEVELOPMENT IN THE UNITED STATES

D I G E S T

The economic and environmental advantages generally associated with deepwater ports and the expected continued U.S. reliance on large quantities of imported oil suggest that the development of a mid-Atlantic deepwater port may be desirable. It deserves attention at this time.

Therefore, GAO recommends that the Secretary of Transportation complete a study of the cost-effectiveness and feasibility of a mid-Atlantic deepwater port by December 31, 1978. The Secretary should also submit to the Congress, within 6 months of the completion of the study, a plan for the port's development, unless some other option is more desirable.

FINDINGS AND CONCLUSIONS

The United States likely will continue to depend highly on large quantities of imported oil. Large tankers offer the most economical method for moving great volumes of crude oil over long distances. Because the United States does not have deepwater port facilities capable of handling the large tankers now commonly used, oil must be transferred from large to smaller vessels directly or at deepwater ports in the Canadian Maritimes and the Caribbean before delivery to U.S. ports. These practices enable industry to realize many of the economic benefits of using supertankers but ignore the environmental benefits and additional economic benefits of deepwater ports. This makes the United States more dependent on foreign countries for transporting its energy supplies.

Without the development of deepwater ports in the United States, the projected level of petroleum imports will require a continuous increase in the number of smaller tankers necessary to haul oil imports. This increase

will create more coastal ship traffic, port congestion, and hazards of collision and oil-spill.

According to the Department of Commerce, offshore deepwater ports using pipelines to transport oil to shore would provide a safer alternative for oil delivery than feeder vessels.

Industry is planning to construct and operate deepwater ports off Louisiana and Texas. Additionally, the greater harbor depths available at Los Angeles and Puget Sound obviate some of the need for new deepwater port facilities on the west coast. There are no deepwater port proposals now being considered for the mid-Atlantic areas. Earlier proposals were opposed by some State and local governments largely because of concern that

--oilspills will occur from large tankers and deepwater port operations and

--deepwater ports will precipitate the expansion of secondary industrial growth, such as refinery complexes.

Also, because of the poor prospects for considerable increase in the refinery capacity in the mid-Atlantic, the economic feasibility of a mid-Atlantic deepwater port has been questioned.

GAO recognizes that these and other factors could effect the feasibility of a mid-Atlantic deepwater port but notes that a complete picture of economic and environmental trade-offs is lacking. GAO believes that a deepwater port on the Atlantic coast may be in the national interest and considers it premature for policymakers to judge its feasibility until the definitive study that GAO recommends is completed.

It is highly unlikely that any of the proposed deepwater port and pipeline systems could be constructed by 1978 and used to move surplus Alaskan crude oil from the west coast to

domestic markets. Assuming the surplus will be long term, the construction of a west-to-east deepwater port and pipeline system would serve the national interest for distributing oil to midwestern and eastern markets.

In the interim, surplus oil could be marketed by shipping the oil through the Panama Canal to the gulf and east coasts.

RECOMMENDATIONS TO AGENCIES

The Secretary of Transportation, with the cooperation and advice of the Secretaries of Energy and Commerce and in coordination with other Federal, State, and local governments, private industry, and public interest groups should complete a mid-Atlantic deepwater port study by December 31, 1978. The study should address the following points:

--The optimum location and number of deepwater ports in the mid-Atlantic area.

--The cost of constructing these ports at a size that could handle maximum crude oil throughput which is compatible with existing refinery capacity in the area.

--The potential for refined product use and, if viable, development of plans and cost estimates for port capability to reasonably handle foreseeable levels of refined products either coconstructed with the crude oil facilities or constructed as a discrete project.

--The procedures, regulations, and other legal arrangements necessary to assure that area deepwater port capacity for crude oil, built to serve existing refinery capacity, could not be expanded without meeting all the procedures and requirements that now apply to initial construction efforts.

--The requirements that all vessels unloading at the ports, and the ports themselves, use at least the best available pollution control technology, including provisions

to incorporate reasonable technological advances into the regulations.

--The alternative financing and management options, including a public/private combination and all-public option if industry appears unwilling or unable to undertake such ventures on its own.

Within 6 months of completion of the study, the Secretary of Transportation should submit a detailed plan to the Congress. The plan should identify a program to construct and operate a mid-Atlantic deepwater port. This should include additional legislative and funding authorities, unless it is found that the economic and environmental benefits are outweighed by the costs or other factors identified in the study. If the study finds the port undesirable, the Secretary of Transportation should report this finding to the Congress and present his recommended option(s) for transporting imported oil.

AGENCY COMMENTS

Department of Energy

Because of the limited east coast refining capacity, economic gains from a mid-Atlantic deepwater port are not sufficient to justify a high-priority study.

Department of Commerce

The findings in the report do not justify a deepwater port on the mid-Atlantic coast. Limitations on refinery capacity, potential onshore secondary impacts, the increasing costs of building such a port, and potential impacts of offshore oil finds in the mid-Atlantic prevent a crude oil daily volume flow needed to make such a port economically feasible.

Department of Transportation

The Department agrees with GAO's findings and recommendations and has begun to study some of the issues discussed in the report.

GAO believes that the arguments against studying the cost-effectiveness and feasibility of a mid-Atlantic deepwater port fail to recognize the uncertainty and controversy surrounding the issues and to take account of new data and assumptions not made in previous studies.

RECOMMENDATIONS TO THE CONGRESS

The Congress should schedule appropriate hearings on the study's results. Also the Congress should enact legislation to expedite required Federal approvals of transportation systems to move surplus Alaskan crude oil to Northern Tier or other inland States. At least one bill (S. 1868) has been introduced to provide for expedited Federal review.

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ABBREVIATIONS

Btu	British thermal unit
CAPICO	Central American Pipeline Company
DOT	Department of Transportation
DWT	deadweight ton
ERDA	Energy Research and Development Administration
FEA	Federal Energy Administration
GAO	General Accounting Office
LOOP	LOOP, Inc.
OTA	Office of Technology Assessment
Quads	quadrillion British thermal units
SEADOCK	SEADOCK, Inc.
SOHIO	Standard Oil Company of Ohio

CHAPTER 1

WHY DEEPWATER PORTS?

The development of deepwater ports in the United States has received a considerable amount of attention in recent years, primarily due to the increasing size of oil tankers in the world tanker fleet and due to the country's increasing reliance on oil imports.

A deepwater port is one element in an overall oil transportation system whose parts are closely interrelated. The system has these major components.

--A very large ocean vessel bearing oil from overseas.

--A terminal and associated storage facilities.

--A distribution system that could be a pipeline, a smaller feeder vessel, or some combination of the two to supply onshore markets.

Depending on the topography of an area, a deepwater port in the United States may be near shore where deepwater naturally exists, or it could be a terminal constructed 20 to 30 miles offshore. Generally, a deepwater port is at least 60 feet deep; this is the depth required to accommodate a fully loaded 200,000 deadweight ton (DWT) oil tanker. The largest tankers in operation exceed 500,000 DWT, draft (or displace) over 90 feet, and require at least 100-foot depths for navigation.

The growing world need for petroleum and long ocean transportation routes and associated costs have caused enormous increases in ship size. By 1945 the average capacity of oil tankers was about 20,000 DWT. At the end of September 1975, the average tanker size in the world fleet was 79,700 DWT. Of the total fleet (3,454 vessels), 572 ships were each over 175,000 DWT and accounted for 51 percent of total tonnage. New tankers scheduled for delivery after September 1975 averaged 151,000 DWT each. 1/ (See app. I for all notes.) The motivation behind this dramatic growth in ship size and capacity has been to reduce the cost of transporting crude oil from its source to its ultimate destination; this sometimes involves hauls of over 12,000 miles.

Because of U.S. historical self-sufficiency in petroleum, deepwater port facilities were not necessary until a few years ago--since 1960 the United States has become increasingly dependent on imported oil. Dependence

on imports rose from 18 percent in 1960 to about 42 percent in 1976--a daily average of about 7.3 million barrels. The greater volume of imported oil, coupled with the increased worldwide use of large tankers, has encouraged industry to propose building U.S. deepwater ports to accommodate tankers over 100,000 DWT.

The President's National Energy Plan indicates that rapid economic growth and no new conservation initiatives could expand total U.S. energy demand at an average annual 3-percent rate between 1976 and 1985. Oil consumption could rise from 17.4 million barrels a day in 1976 to 25 million by 1985;--this is nearly a 44-percent increase. The administration estimates that if the National Energy Plan were adopted, total oil imports by 1985 would be 7 million barrels a day. However, we believe that this figure is understated by about 5 million to 6 million barrels a day, largely due to the administration's optimistic estimates of domestic crude oil production and energy to be derived from coal, natural gas, nuclear power, and voluntary public cutbacks in energy consumption (See our report EMD-77-48, July 25, 1977, and EMD-78-5, Oct 14, 1977.) The consensus is that the United States is likely to remain heavily dependent on imported oil to the year 2000.

Many nations have already built deepwater terminals to accommodate large tankers. Such facilities include ports that have been located on or very near naturally deep water, dredged harbors and channels, and offshore structures.

The United States does not have any deepwater port facilities capable of handling tankers exceeding the 200,000-DWT class. The largest ship that can be accommodated in any port along the east or gulf coasts is about 80,000 DWT. Due to the naturally deeper water, some west coast ports can handle fully laden tankers up to 150,000 DWT.

Various Government and industry studies show that the logical areas to locate U.S. deepwater ports are in coastal waters near centers with large refining capacities. Attention for developing deepwater ports has centered around the Delaware Bay to New York area on the east coast; the Mississippi River to Galveston, Texas, area on the gulf coast; and the Los Angeles and Puget Sound areas on the west coast. The east coast and gulf coast areas have received the most attention due to their (1) heavier reliance on imports, (2) large demand for oil, (3) close proximity of refineries, (4) natural shelter from extreme weather conditions, and (5) existing pipeline network that transports crude oil

from the gulf coast to the Midwest and refined products to the east coast.

ECONOMIC BENEFITS OF DEEPWATER PORTS

Large oil tankers offer the most economical method of moving great volumes of crude oil over long distances. For example, a marine transportation study 2/ estimated a cost of $12 for each DWT to haul oil in an 80,000-DWT tanker from the Persian Gulf to New Orleans. The cost for the same haul in a 380,000-DWT tanker was about $7 per DWT--41-percent less. Therefore, savings could be realized if U.S. ports could receive deep draft tankers.

Increased reliance on deepwater ports and large oil tankers would result in reduced transportation costs that would favorably affect the U.S. balance of trade and payments. For example, about $515 million to $580 million in 1975 dollars could be diverted from the U.S. balance-of-payment deficit if 3 million barrels a day of crude oil imports were transported to deepwater ports on the gulf coast by large foreign flag tankers rather than by mostly foreign flag transshipment from the Caribbean in smaller ships. 3/ It must be recognized, however, that financial savings associated with a deepwater port may not be passed on to consumers in the form of reduced petroleum prices. Such savings could be used for additional investment, additional corporate taxes, additional dividends, and further exploration and would tend to delay needed price increases from rising operating costs.

ENVIRONMENTAL BENEFITS OF DEEPWATER PORTS

Without the development of deepwater ports in the United States, the projected level of petroleum imports will require a continuous increase in the number of smaller tankers necessary to haul oil imports, possibly from distant supply sources or transshipment terminals and refineries in the Caribbean and Canada. This increase will create more coastal ship traffic, port congestion, and hazards of collision and oilspill.

The construction of a deepwater port terminal could reduce the traffic level to and from coastal ports. The exact number of ships involved would depend on the type and location and the amount of petroleum products handled by the port terminal selected. On the basis of Department of the

Interior data, about 1,386 tankers of the 50,000-DWT class would be required to deliver the anticipated 7.7 million barrels of imported oil a day that the Bureau of Mines projects for 1985. Only about 257 ships of the 250,000-DWT size would be required to move the same volume. 4/ If oil imports rise to the levels discussed in our report on the National Energy Plan (12 million-13 million barrels per day by 1985), it would require an estimated 2,200 tankers of the 50,000-DWT class to deliver about 12.5 million barrels of oil per day. Only about 400 ships of the 250,000-DWT size would be required to move the same volume.

A monobuoy, or platform terminal, with a pipeline connection to storage areas located 15 to 25 miles offshore would divert large tanker traffic from harbors and shipping lanes. Not only would the actual number of tankers (relative to the volume of crude oil transported) be fewer, but the ships would not come near the shore. The large tankers' cargo would be discharged into pipelines and delivered to onshore receiving points. A hypothetical deepwater port layout including onshore facilities is illustrated in figure 1.

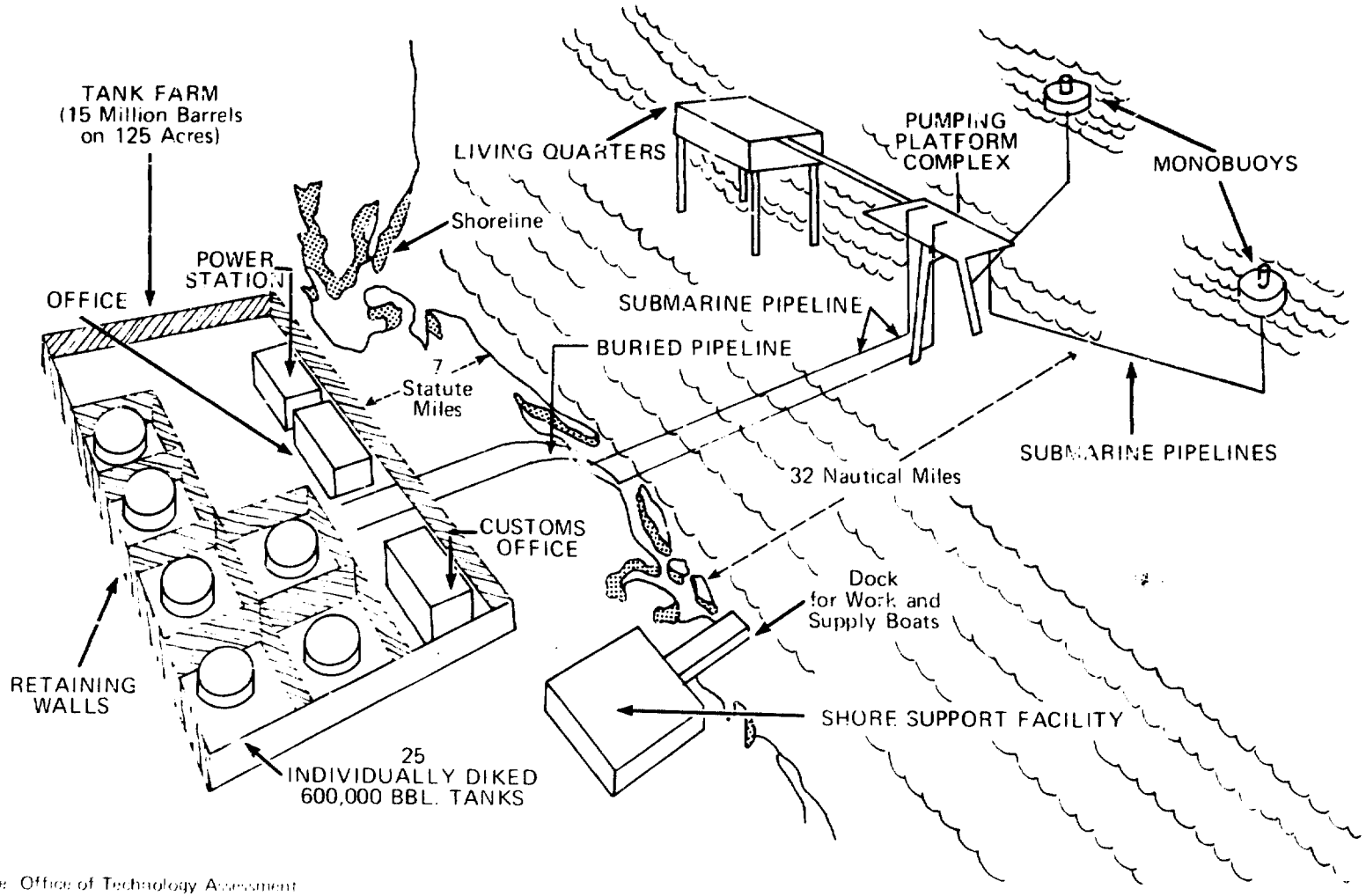
A major issue involved in reducing ship traffic congestion by using deepwater ports is the method of transporting the oil to shore. If the oil were lightered to smaller tankers or barges, a major environmental advantage in deepwater ports would be lost. For example, on the east and gulf coast the number of tankers would still be reduced by using large ships, but possibly 500 to 1,000 smaller feeder carriers would be introduced into the already crowded ports, harbors, and channels. 5/

The Commerce Department has found that pipeline delivery from deepwater ports is much safer than the alternative feeder vessel on the basis of the following considerations:

--A pipeline is a closed, subsurface delivery system that is not affected by weather or traffic patterns in shipping lanes.

--A pipeline reduces the number of vessels and therefore the probability of collision or grounding in congested harbors and nearshore areas, both of which are particularly sensitive to environmental damage.

Hypothetical deepwater port layout including onshore facilities.



Source: Office of Technology Assessment

Coast Guard data shows that, on the basis of an analysis of 51 collisions involving tankships, 62 percent occurred in rivers, bays, and estuaries; 17 percent in harbors; and 21 percent on the high seas. 6/ This shows an almost 4-to-1 ratio of inshore/harbor accidents over offshore mishaps. The collisions generally involved vessels of less than 1,000 gross tons and occurred when smaller nontankers collided with tank ships. The striking ship speeds ranged from 1 to 18 knots; or else the tankers were dead in the water at moorings at the time of collision. One Coast Guard study of vessel collisions of all kinds indicates that most collisions occur in darkness. Location of an isolated off-loading facility some distance from shore could greatly reduce the probability of these collisions.

A study of 266 oilspills due to tanker accidents throughout the world shows that 66 percent of the accidents were the result of groundings, collisions, or rammings. 7/ According to the study, the most disastrous and most frequent spills resulted from groundings in the shoal approaches to harbors (70 percent of all groundings and collisions) and in the coastal zones (19 percent), where the tidal current could spread oil 9 miles within 3 nours. If the grounding or collision occurred 20 miles offshore, the oil would be spread less than 1 mile in 3 hours. The study also indicates that this difference is very significant to oil removal or dispersion before it reaches an estuary; moreover, the risk of grounding would be nearly eliminated for large tankers delivering oil to offshore terminals in water 100 to 120 feet deep.

In view of the economic and environmental advantages of deepwater ports and the expected continued U.S. reliance on large quantities of imported oil, we believe that the development of deepwater ports in the United States is in the national interest.

GOVERNMENT AND INDUSTRY ROLES IN DEEPWATER PORT DEVELOPMENT

By passage of the Deepwater Port Act of 1974, Public Law 93-627 (33 U.S.C. 1501-24), the Congress recognized that deepwater port development may be a desirable and necessary addition to the country's transportation capabilities. This act authorizes the Secretary of Transportation to receive and approve license applications for deepwater ports located outside the territorial limits of the United States.

The Secretary of Transportation is to consult with other Federal agencies having responsibilities applicable to deepwater ports. The Secretary is also to consult with and consider the recommendations of adjacent coastal States and the general public. The Secretary may grant licenses if the applications are consistent with the various criteria established by the act.

Before issuing a license for a deepwater port, the Secretary must determine that the construction and operation of the deepwater port will be in the national interest and consistent with national security and other national policy goals and objectives, including energy sufficiency and environmental quality. The Deepwater Port Act of 1974 allows adjacent coastal States to veto deepwater port projects. A deepwater port project must conform with all applicable provisions of the Clean Air Act, Federal Water Pollution Control Act, and the Marine Protection, Research, and Sanctuaries Act.

Although the Deepwater Port Act does not apply to port development within U.S. territorial limits, both the coastal States and the Federal Government have certain responsibilities for regulating such development. However, in matters of foreign or interstate commerce (such as importing of oil for the Nation), the Federal Government has primary authority.

The Federal Government's role in deepwater port development has been regulatory, requiring that industry obtain Government approval to develop deepwater ports. In essence, this is a passive role (1) permitting industry to initiate proposals where and when deepwater ports will be built and to totally finance the ports' development and operation and (2) allowing State and local governments to decide whether a deepwater port would be desirable from an economic and environmental perspective.

CHAPTER 2

METHODS USED TO SHIP OIL TO THE UNITED STATES

Lightering and transshipment are two methods that are currently used by industry for shipping oil into the United States. Although these methods do help industry to realize some economic benefits from large tankers, they appear to be more environmentally hazardous than deepwater ports--principally due to the congestion created in existing ports. The transshipment method also makes the United States more dependent on foreign countries as a transportation link, since the United States relies on deepwater ports located in the Canadian Maritimes and the Caribbean.

LIGHTERING

Lightering is a technique of transferring cargo from large tankers at sea or in a protected bay directly to smaller vessels for delivery into existing ports. The technique was pioneered several years ago by some major oil companies for deliveries to European ports and is common practice in military fleets. Operating experience is reportedly good and no major spills have occurred. 1/

Lightering enables industry to realize the economy of using large tankers for the majority of the ocean journey. The major disadvantages of lightering follow:

--It is unsafe in rough seas.

--It would tend to cause congestion if used on a large scale near approaches to existing harbors.

--The double cargo transfer is more expensive than direct shipment by a large tanker.

From the environmental standpoint, lightering a large tanker by offloading part of its cargo into a lighter (shuttle vessel) is reportedly no safer than the use of monobuoys for offloading cargo because, in practice, the ship-to-ship crude oil transfer operation is accomplished with the two vessels lashed together, separated only by large pneumatic fenders. 2/ Spills have been infrequent under this arrangement, but the potential for accidental rupture of an oil tank because of a maneuvering problem does exist.

In moving the cargo to onshore storage facilities, however, strong differences exist between the potential

environmental effect of shuttle vessels and the pipeline delivery from a monobuoy to shore. If future oil import projections are valid and if no deepwater port facilities are provided, a large increase in the number of smaller feeder vessels carrying oil will be needed.

The marginal economics usually associated with at-sea lightering causes users to regard lightering as a temporary practice until proper port facilities become available. Furthermore, practical use of transferring oil between vessels at sea is not likely to be extended to a large import program because successful implementation of the method requires use of the most highly skilled vessel crew available due to the operation's hazardous nature. When used on a large scale, the lightering operation's integrity with accidents and spills would almost certainly deteriorate. Thus, the greatest environmental risk attributable to lightering would be from oilspills, accidental spills, and ship casualties.

Presently, lightering generally takes place in the calm waters of estuaries and bays. The actual transfer operation and the greater ship traffic would increase the risk of accidents. For economic reasons, it should be assumed that the tankers and barges used for transfer would be the largest size capable of negotiating the channels leading to the discharge facilities; hence, the greatest volume would be involved. Spills, whether from collisions or grounding, would occur in a confined area; the oil could reach shore in a very short time and containment would be difficult.

DOT officials told us that proposed U.S. Coast Guard regulation of lightering operations, however, will change this situation. In the future, lightering will occur in deep water offshore, not in the bays and estuaries with restrictive entrance channels. These regulations should decrease the incentive to lighter, since the operation would likely be more difficult and environmentally risky in open seas.

TRANSSHIPMENT

Transshipment involves moving crude oil from large tankers to nearby foreign deepwater ports (off Canada's coast and in the Caribbean) and then to U.S. ports by small tankers. Due to opposition to further industrial development, including deepwater ports, in some U.S. regions, major oil companies have been active in foreign locations to provide deepwater ports for receiving large tankers to supply crude oil for local refineries as well as to transship crude

oil and refined products from those refineries to the United States in small tankers.

Transshipment has some of the economic advantages of lightering at sea (such as the use of larger tankers for most of the ocean journey) while it avoids many of the environmental hazards and scheduling problems associated with large-scale lightering-at-sea operations. Some major disadvantages of transshipment follow:

--The congestion problem associated with using a large fleet of small vessels remains, along with the attendant increased risk of oilspills.

--Dependence on foreign countries in transporting U.S. energy supplies is increased due to transshipment through a foreign country.

--Because the transshipment facilities' location normally causes increased refining capacity in those foreign countries with subsequent increased imports of refined products to the United States, the increased employment and increased gross national product are, in effect, exported to those countries.

Transshipment facilities to serve U.S. ports are already operating in the Canadian Maritimes and at Aruba, Bonaire, Curacao, and the Bahamas in the Caribbean. About 60 to 80 percent of transportation savings attributed to direct shipment to the United States by large tankers can be realized by transshipment. 3/

Probably the greatest environmental hazard resulting from transshipment would be the increased potential for oilspills in the sensitive nearshore estuaries. The prospect of increased numbers of small tankers in already congested waterways would greatly increase the risk of collision, ramming, or grounding and the likelihood of environmental damage due to oilspill pollution.

CHAPTER 3

INDUSTRY PLANS DEEPWATER PORTS FOR THE GULF COAST

Deepwater ports on the gulf coast would provide an improved transportation system for imported oil. Industry is planning to construct and operate deepwater ports off Louisiana and Texas; therefore, the Federal Government's passive role with deepwater port development in the gulf coast seems adequate.

The Gulf Coast States, including Texas and Louisiana, are the Nation's principal oil producers and refiners. Deepwater ports have not been built because most of the oil demand (until recently) has been satisfied by domestic resources. However, domestic crude oil production along the gulf coast has begun to decline and will continue to do so, assuming no new discoveries of unforeseen magnitude, 1/ so that unless additional crude oil supplies are imported, refining capacity in the area will not be completely used. In addition to supplying regional refineries, the gulf coast ships crude oil to the Midwest through existing pipelines. Thus, primarily because of declining domestic production and increasing needs for crude oil, imports will be directed to the gulf coast in rapidly increasing volumes until at least 1990 or 2000. 2/ Nearly 1.2 million barrels a day of crude oil were imported to the gulf coast in 1975. According to a consultant's report, estimated volumes of crude oil imports for the gulf are as follows: 3/

1980	1985	1990	2000	2010
-------(millions of barrels per day)--------				
5.2	7.4	9.1	9.1	10.1

These estimated increases are based on the increased refining capacity under construction and planned for the gulf coast and existing arrangements to supply the Midwest with crude oil. These figures are the basis for the two proposed deepwater port projects off the coasts of Texas and Louisiana. Although these imports do not reflect the administration's energy plan through 1985, they are consistent with our estimates of 12 million to 13 million barrels a day of crude oil imported by 1985.

The Texas terminal is proposed by SEADOCK, Inc. The proposed port would be in 100 feet of water 26 miles south

of Freeport, Texas. The port would be constructed in two phases: phase one has an average throughput capacity of about 2.5 million barrels a day; phase two would not be started until throughput agreements from owners and nonowner shippers verified the economic viability for further expansion. In 1977 the cost of phase one was estimated at about $700 million, assuming a 1979 start and completion in 1980.

Louisiana Offshore Oil Port, Inc. (LOOP), proposes a port located in about 100 feet of water 18 miles south of Grand Isle, Louisiana. 4/ LOOP intends to construct the port in three phases. The port is to start operation with an average throughput capacity of 1.4 million barrels a day and is to expand to a third-phase average capacity of 3.4 million barrels a day. Construction of phases two and three are not to be started until throughput agreements from owners and nonowner shippers verify the economic viability of each planned expansion. Completion of phase three is scheduled for December 31, 1989. The cost for the first phase of this port project was estimated at $348 million in 1976. Total facility cost through phase three was estimated at about $800 million. 5/

SEADOCK and LOOP both applied on December 22, 1975, to the Department of Transportation (DOT) for licenses under the Deepwater Port Act of 1974. Both licenses were approved on December 17, 1976, after review by DOT and other affected Federal agencies. An environmental impact statement was prepared, incorporating the views of industry, State and local governments, Federal agencies, and other interested groups.

In approving the licenses, the Secretary concluded that:

--The deepwater ports would greatly reduce the risks of environmental harm from oil importation. The latest technology in pollution prevention and control will be applied in the deepwater ports' construction. Oilspills resulting from offloading, transshipment, or harbor collision will be reduced substantially.

--The cost of transporting crude oil would be reduced by as much as 30 percent. Licenses are structured to create the proper incentives and controls to assure that savings would pass to the consumer.

The Secretary of Transportation stated that issuing licenses to SEADOCK and LOOP would inevitably deny other

potential applicants the opportunity to propose a deepwater port for offshore Texas and Louisiana; consequently, the licensees take on a special performance obligation. The Secretary stated that the applicants' ability to perform must be assured; otherwise, the transportation benefits of a deepwater port in this coastal area would be denied for all time or delayed for decades.

The Secretary stated that these determinations further require the assurance that the best available technology is used to develop a facility that is environmentally sound, safe, and energy efficient. He concluded that these requirements must be tempered by due respect for international treaties and obligations and the recognition of the reciprocal benefits that accrue to all nations from the reasonably free use of the high seas. He also said the environmental and safety benefits of removing thousands of small vessels from congested harbors and ports must weigh heavily in assessing the overall environmental desirability of deepwater port construction, and mentioned that the concerns of coastal States and other Federal agencies with offshore responsibilities must also be considered seriously in reaching these determinations.

The Secretary further stated that by franchising a limited number of ports that may offer the benefits of considerably lower costs to their users, the Nation was undertaking a new venture in the complex world of oil, pipeline, and shipping economics. He pointed out that the economic consequences of these ventures could not be predicted precisely, nor could airtight conditions to meet every conceivable contingency be provided. According to the Secretary, the basic legal framework already operating in this area--antitrust laws and transportation regulatory laws--offer continuing consumer protection and that these remedies will remain intact. He said it would be myopic, if not irresponsible, to not address as completely as possible potential antitrust problems that might arise from the operation of these ports. With the aid and advice of the Attorney General and the Federal Trade Commission, the Secretary has established license conditions and continuous monitoring to assure that these ports are owned and operated without discrimination and that they do not adversely affect competition, restrain trade, or promote monopolization.

The Secretary recognized that the combination of conditions may deter the licensee from accepting the license. If this happens, then other potential applicants may be considered. Nevertheless, if SEADOCK and LOOP decide to accept

the licenses and agree to comply with the conditions, then the Secretary judged that the proper operating framework and set of incentives will have been established for assuring that the port enhances the environment, improves marine safety, and achieves economic efficiencies without restraining competition.

The Secretary pointed out that the Congress established a system of priorities in the Deepwater Port Act and that the act expressed a preference for public ownership or ownership by nonusers. According to the Secretary, the Congress specifically addressed and rejected the proposition that prospective users (for example, petroleum-producing companies) be ineligible. Consequently, the Secretary considered it contrary to the expressed intent of the Congress to deny the application because the license owners are potential users of such a facility.

The two licenses were signed on January 17, 1977. For 6 months following the signing, SEADOCK and LOOP made ownership shares available to any person or business entity that would assume the obligations of an owner. Fifteen days after ownership is closed, SEADOCK and LOOP are required to provide evidence acceptable to the Secretary of Transportation that the owners and shareholders will furnish such technical and management support necessary to complete port construction in accordance with the conditions of the license.

Since the Secretary offered the licenses, LOOP and SEADOCK have disclosed several problems with conditions of the licenses. Officials of the consortia stated that those problems included

--certain unreasonable demands on consortia owners, such as voting rights and financial responsibilities;

--potential conflicting regulatory requirements;

--unreasonable limited and unlimited liability requirements; and

--certain common carrier obligations not previously required.

LOOP and DOT reached mutually acceptable agreements on August 1, 1977, and LOOP has apparently advanced to the phase of preparing for actual construction. SEADOCK has not reached agreement with DOT and further has had three companies that held 52 percent of the shares withdraw from the consortium, leaving SEADOCK's future in doubt. As a

result, SEADOCK has extended its ownership shares availability until April 20, 1978.

SEADOCK has an additional problem with air quality effects from its onshore storage facilities that are located in an area that is not in compliance with the National Ambient Air Quality Standards established under the Clean Air Act. On December 15, 1976, the Environmental Protection Agency issued an interpretative ruling that requires new or modified pollution sources in an area with air quality worse than the national standards to control their emissions to the greatest possible degree and to reduce other emissions in the area by more than those they produce. In SEADOCK's case it was agreed that the storage facilities will produce at least 123 tons of hydrocarbons a year and that SEADOCK would have to reduce 150 tons a year from other emissions in the area. Since SEADOCK is a new corporation, it owns no facilities emitting pollutants, and therefore either the owners must reduce emissions of their facilities or SEADOCK must clean up another company's emissions. No agreements have been reached to resolve this barrier.

Texas recently passed legislation to permit the State to pursue building a project similar to SEADOCK's if SEADOCK is canceled. Moneys for the State project would come from State revenue bonds backed by throughput commitments from the users of the port. If a deepwater port resulted from this legislation, the project could be delayed by as much as 1-1/2 years because of (1) time required to obtain financing and (2) a new license from the Secretary of Transportation being required, thereby essentially starting the entire process over.

Other likely alternatives to SEADOCK are a newly proposed transshipment facility on the Cayman Islands south of Cuba 6/ and a deepwater port-dredging project at Corpus Christi, Texas. As discussed in chapter 3, the transshipping alternative does provide economic transportation savings similar to a deepwater port but does not resolve congestion problems associated with small vessels and resultant increased risks of oilspills, nor does it reduce our dependence on foreign countries in energy supply transportation.

DOT told us that in its view the Cayman Island alternative is a less viable alternative to SEADOCK than the Corpus Christi project. DOT said that while a transshipment terminal can conceivably enjoy most of the economic advantages of a deepwater port, there will be no environmental advantage to this option. Smaller tankers will still be

needed to deliver oil to small onshore ports and this will continue to contribute to conjestion and potential collision risks. Also, the Cayman Island transshipment proposal has a capacity of only 1 million barrels a day, whereas SEADOCK has an ultimate capacity of 4 million barrels a day.

The Corpus Christi alternative involves dredging an 80-foot deep channel for about 12 miles from the Gulf to Harbor Island. The channel would be able to accommodate tankers up to 300,000 DWT. Plans for this project have already been submitted to the Corps of Engineers.

CHAPTER 4

A DEEPWATER PORT MAY BE DESIRABLE ON THE MID-ATLANTIC COAST

One of the primary benefits of a deepwater port is the environmental advantages it can provide. Such a port allows tankers to unload offshore outside coastal harbors and waterways; this would reduce ship traffic in the areas. This, in turn, would help reduce the risk of ship collisions and groundings and subsequent oilspills near aquatic-rich coastal zones.

There are no deepwater port proposals now being considered for the mid-Atlantic coastal area. Yet, we believe that at least one deepwater port on the mid-Atlantic coast might be in the national interest due to the environmental and economic benefits such a port could provide. To encourage such development the Federal Government would have to assume a leadership role in contrast to the passive role it has played to date on deepwater port development.

A mid-Atlantic deepwater port is even more important for crude oil imports because no major crude oil pipeline network exists from other regions, especially the gulf area, into the east coast refining center. The other transportation alternatives of transshipment, lightering, or direct shipment in small tankers are all more costly and have greater potential for adverse environmental impacts.

ENVIRONMENTAL BENEFITS

There are two areas in the mid-Atlantic that receive most of the oil that is shipped to the east coast by tanker. The first is the Delaware Bay and River, which is the major water route for shipping crude oil to refineries in eastern Pennsylvania, southern New Jersey, and Delaware. The second area is New York Harbor (on the New Jersey side of the port) which is used to deliver crude oil to refineries in northern New Jersey. In 1976 the combined capacity of the 10 major refineries in those two areas represented 82 percent of the 1.8-million barrels-a-day east coast refining capacity.

The ports on the Delaware River and the New York Harbor together are probably the most heavily used in the United States. In 1976 crude and refined oil was transported to the east coast at the rate of 4.7 million barrels per day.

The Office of Technology Assessment (OTA) recently reported 1/ that annual major vessel arrivals at Delaware Bay and New York Harbor exceed 5,000 and 8,000 respectively. Major tankers entering and leaving numbered nearly 3,000 per year for each harbor, and these two ports combined handled over one-third of all U.S. imported and domestic oil transported by tanker. As the number of ships needed to transport oil to the mid-Atlantic increases, the potential for oil-spills in these confined and congested harbors and waterways will also increase.

Sherman H. Clark Associates has estimated that by 1990 east coast oil demand will have reached 9.1 million barrels a day. 2/ Assuming that 75 percent of the future crude and refined oil supplied to the east coast will be transported by ship, as it was in 1976, then about 6.8 million barrels per day would have to be transported in 1990. Therefore, an additional 2.1 million barrels a day over 1976 levels would have to be shipped. Without a deepwater port, the effect of such an increase in oil shipments would increase small tanker traffic (55,000 DWT and under). Assuming a tanker size of 50,000 DWT, about seven additional tankers a day would be required to deliver the additional 2.1 million barrels; this would be a yearly increase of about 2,600 tanker trips. Tanker traffic could exceed this amount considerably if tankers smaller than 50,000 DWT were used.

Loaded tankers of more than 55,000 DWT draw too much water to reach oil terminals on the Delaware River and at New York Harbor without being lightered. The controlling depth of the Delaware River channel is 40 feet. Large tankers up to 150,000 DWT now anchor inside Delaware Bay, off Big Stone Beach, Delaware, and 90,000 DWT outside of New York Harbor to pump part or all of their oil into barges for onshore distribution. 3/

In 1975 oil from 429 tankers was lightered to 1,055 barges in the Delaware Bay. Spillage reports on these lightering operations, run by an oil transport company, indicate that the operations were clean and free of accidents that lead to pollution. 4/ Officials of the lightering firm reportedly claim the operations were responsible for only 5 gallons of oil spilled into the bay during 1975. According to OTA, however, this is not an adequate measure of the risks of the present system because lightering operations force a major increase in barge and small tanker traffic, and these vessels themselves often are responsible for serious polluting accidents.

Two principal factors make the risks of damaging oil-spills from a larger tanker/deepwater port system lower than

the risks from the exclusive use of small tankers. First, a deepwater port allows the use of large tankers which can reduce the number of tankers that must be used to move a given quantity of oil. Second, if oil is spilled at a deepwater port, the distance between the port and the shoreline may reduce damage to coastal areas.

An oilspill risk assessment made for OTA showed that the likelihood of spills in rivers, harbors, and coastal waters of the mid-Atlantic out to 50 miles is reduced by about half if a large tanker/deepwater port system, rather than small tankers, is used to move oil. 5/

The Coast Guard's final environmental impact statement about a proposed deepwater port off the gulf coast disclosed that the use of 50,000-DWT ships carrying crude oil from the Caribbean to U.S. conventional ports could result in an overall spill rate of about 34 barrels spilled per 1 million barrels handled. However, if shipped by larger tankers to the proposed U.S. deepwater port, the spill rate would be about five barrels per 1 million barrels handled. The lower oilspill rate estimated for the use of larger tankers at a deepwater port was attributed to lower traffic densities, less risk of grounding and ramming, the generally lower risk of explosion and fire, and the reduction in time spent navigating within 50 miles of the coast. 6/

Although using a deepwater port and large tankers on the mid-Atlantic should reduce oilspill risk, there still is considerable public concern over potential oilspills associated with deepwater ports and the large tankers that would use them, especially large spills that may reach New Jersey or Delaware beaches. Recent oil tanker incidents, such as the oilspills off the Massachusetts coast near Nantucket Island and the Delaware River and the tanker explosion at Los Angeles Harbor, continue to strengthen public concern over the environmental hazards of transporting oil by sea.

In a November 1976 report, OTA stated that tanker spills are the source of 5 to 15 times as much oil pollution as all offshore drilling and port operations combined. The report said that equipment used in deepwater ports appears to have performed well in many worldwide applications, but the large tankers that use the ports are far less dependable, and greater efforts are needed to reduce tanker-caused pollution to acceptable levels. OTA reported that the following options are available to the Congress for dealing with tanker-caused pollution.

--Require the Coast Guard to analyze oilspill causes so that priorities may be set for implementing design and

operations standards for large tankers calling at U.S. deepwater ports.

--Require the Coast Guard to develop specific regulations for tankers using U.S. deepwater ports.

--Provide economic incentives to U.S. importers to encourage them to charter only those tankers that meet high standards of design and operations.

On March 22, 1977, the Administration proposed three distinct initiatives that concentrate on improving existing international standards of tanker safety. These are (1) tanker construction and equipment standards, (2) tanker certification and inspection standards and practices, and (3) crew licensing and qualification standards. On May 26, 1977, the Senate passed the Tanker and Vessel Safety Act of 1977 (S. 682) incorporating these initiatives. Although hearings have been held on this subject by the House Committees on Merchant Marine and Fisheries and International Relations, to date no similar bill has been introduced in the House of Representatives.

ECONOMIC BENEFITS

Many studies between 1970 and 1973 stressed the economic advantages of deepwater ports for the mid-Atlantic. 7/ In general, they concluded that it would cost less to ship oil from Africa or the Persian Gulf to east coast refineries with large tankers and deepwater ports than with the existing system. A range of sites and systems was proposed. Savings, compared to such alternatives as transshipping through Caribbean ports, were estimated to be 5 to 15 cents per barrel. 8/ Though this is a small unit cost, according to OTA it translates to major savings for a transport system carrying nearly half a billion barrels a year to the east coast--between $75 million and $225 million a year. 9/ In addition, the environmental advantages of deepwater ports far outweigh other transportation alternatives.

It should be noted, however, that the economic advantages presented in many of the deepwater port studies were based on assumptions that refinery capacity on the east coast would expand. However, because of the poor prospects for considerably increasing the refinery capacity in the mid-Atlantic, the transportation savings to be achieved by using larger ships (relative to other available investment opportunities) may not provide the economic incentive needed for industry to build an east coast deepwater port.

There has been no major increase in refinery operating capacity on the east coast in the past 15 years. In 1961

east coast capacity was about 1.6 million barrels a day compared to about 1.8 million barrels a day in 1976. OTA has reported that existing Federal and State air quality regulations make construction of new refineries along the Delaware River and Bay unlikely in the foreseeable future.

Since 1970 an Amerada-Hess refinery in the mid-Atlantic region has been closed, plans to double the capacity of a Mobil Oil Company refinery in New Jersey have been canceled, and construction has not begun on a Shell Oil Company refinery, originally planned for a site in Delaware and then for a site in New Jersey. 10/ A number of proposed refinery developments on the east coast have been blocked by Federal, State, and local government land-use policies, regulations, and/or referendums.

Faced with opposition to refinery expansion and deepwater port construction on the east coast, the oil industry has expanded its refining capacities on the gulf coast, in eastern Canada, and in the Caribbean. These are the locations that either have deepwater ports (off the Canadian coast and in the Caribbean) or are the most likely places (off Louisiana and Texas on the gulf coast) to have deepwater ports in the future. A decision to build a deepwater port most logically follows--not forces--a decision to build more refining capacity. If expansion of east coast refinery capacity continues to be insignificant, industry is likely to postpone any deepwater port development.

While the refining capacity is a critical factor in determining the economic feasibility of a mid-Atlantic deepwater port, it should not, in our judgment, be accepted as the only factor. We believe there is a need to examine the cost-effectiveness and feasibility of an east coast deepwater port to serve existing east coast import levels. Ignoring this possibility, as has been the case to date, precludes the potential environmental and economic benefits of a deepwater port. Additionally, we believe it may be viable to ship refined products to the east coast through such a port. Again this possibility has been largely ignored.

As stated previously, east coast oil demand is likely to grow over the next 10 to 15 years. If there is no growth in the east coast's ability to refine crude oil to meet east coast demand, the difference will have to be made up by shipping additional refined products. While there are more technical problems associated with operating a refined products pipeline (such as requiring a more diversified onshore distribution system and encountering more difficulty in scheduling product arrival and shipment), the economies associated with increased potential future volumes of refined products may overcome some, if not all, of these obstacles.

DEEPWATER PORTS HAVE BEEN PROPOSED FOR THE MID-ATLANTIC COAST

One site was proposed by the Delaware Bay Transportation Comp , a consortium of oil companies that own refineries along the Delaware River. The consortium purchased 1,800 acres of coastal land in Kent County, Delaware, for storage tanks, landside headquarters, and a supply base for a deepwater port. The consortium's plans called for a port 5 miles offshore but inside the bay. They planned a sea pier that could berth three large tankers of up to 250,000 DWT simultaneously and transfer crude oil into pipelines running first underwater to the tank farm and then overland to upriver refineries. Port capacity was to be 2 million barrels a day, an amount the consortium concluded would satisfy the needs of existing refineries (with expansion that was then planned) and one planned new refinery. The proposed port was to use a natural channel into the bay and require only minimal dredging to maintain a 70-foot draft along the approaches to the port and at the port itself. In the late 1960s, planners projected that construction would cost $193 million. 11/

Local opposition to the Delaware Bay port was strong. Delaware's General Assembly approved one of the Nation's strongest pieces of land use and environmental legislation, the Delaware Coastal Zone Act (7 Del. C. 7001 et seq.), that prohibited the construction of any new heavy industry--including refineries, tank farms, and bulk offshore unloading terminals--in the coastal area. Almost immediately after passage of the law, a campaign was organized to have the law repealed or amended. To date, those efforts have been unsuccessful. 12/

Before the 1973 Arab oil embargo, one oil company gave serious consideration to a deepwater port in 110 feet of water about 13 miles off the coast of Long Branch, New Jersey. The proposal no longer is an active plan. The oil company decided to expand its Baytown, Texas, refinery rather than its Bayway, New Jersey, refinery. Total refining capacity in northern New Jersey is now about 500,000 barrels, which is less than half of the capacity that a company official said would be required to support a northern New Jersey deepwater port. 13/

New Jersey residents, particularly in the south, opposed construction of deepwater ports off the southern shore and the massive industrialization that could result. In 1973 the New Jersey Legislature declined to formally ban deepwater ports and related development and instead made each energy facility proposed for coastal areas subject to individual review. According to a November 1976 report by

OTA, both the present and the immediate past Governors of New Jersey are on record as being opposed to deepwater port development in their State.

ESTIMATED SAVINGS FROM A MID-ATLANTIC DEEPWATER PORT

To evaluate the potential magnitude of transportation cost savings, we made the following analysis between a deepwater port connected to shore by pipeline, and three transportation alternatives--direct shipment, transshipment, and lightering. In addition to the basic shipping charge, we included transshipment, lightering, and pipeline fees in our cost computations. Other charges and fees associated with the transportation of imported crude oil, such as demurrage, deadfreight, and port charges, were not included. Some of these charges and fees contribute more significantly to transportation costs than do others. In general, however, these costs would tend to be greater for the transportation to harbor facilities than offshore port facilities.

Data on imports is based on 1974 crude oil shipments into Delaware Bay and New York Harbors. Transportation costs shown are for the last 6 months in 1977. They have been adjusted to reflect transportation cost variances based on carrier vessel size and crude oil qualities.

New York and Delaware Bay areas receive most of their crude oil imports from three major regional sources--the Middle East, Africa, and South America. The analysis assumes no increase in refining capacity to handle imports from these three regions--presently about 400 million barrels a year.

Because transportation rates vary among countries within these three regions, we assumed that all oil was exported from one country in each region--Saudi Arabia (Middle East), Nigeria (Africa), and Venezuela (South America). Despite different projections of future oil import levels, the quantity of crude oil imported in the mid-Atlantic area should remain relatively constant through 1985 because no major expansion of refinery capacity is presently planned.

ESTIMATED TRANSPORTATION COSTS FOR CRUDE OIL

SHIPMENTS INTO NEW YORK AND DELAWARE BAY

HARBORS UNDER ALTERNATIVE TRANSPORTATION MODES

Direct shipment in tankers 25,000 to 44,999 DWT (note a)

Origin	Long tons of crude oil shipped	Shipping rate per long ton (note b)	Transportation cost
Venezuela	13,500,000	$ 3.57	$ 48,000,000
Nigeria	22,300,000	8.72	194,000,000
Saudi Arabia	19,300,000	c/ 15.44	298,000,000
Total estimated cost			$540,000,000

Assuming deepwater port handling tankers from 160,000 to 319,999 DWT

Venezuela	13,500,000	$ 1.53	$ 21,000,000
Nigeria	22,300,000	3.74	83,000,000
Saudi Arabia	19,300,000	7.79	150,000,000
Estimated pipeline cost ($0.30/barrel)			123,000,000
Total estimated cost			$377,000,000

Assuming lightering in tankers from 45,000 to 79,999 DWT (note d)

Venezuela	13,500,000	$ 2.28	$ 31,000,000
Nigeria	22,300,000	5.58	124,000,000
Saudi Arabia	19,300,000	11.64	225,000,000
Estimated lightering fees ($0.15/barrel)			61,000,000
Total estimated cost			$441,000,000

Assuming transshipment in tankers from 160,000 to 319,999 DWT to Curacao and 25,000 to 44,999 DWT to New York

	Long tons of crude oil shipped	Origin to Curacao		Curacao to New York		Total
Venezuela (note e)	13,500,000			$3.57	$48,000,000	$ 48,000,000
Nigeria	22,300,000	$3.31	$ 74,000,000	3.39	76,000,000	150,000,000
Saudi Arabia	19,300,000	6.98	135,000,000	3.39	65,000,000	200,000,000
Estimated transshipping fee ($0.20/barrel)						63,000,000
Total estimated cost						$461,000,000

a/This class of vessel was used because it is the largest that can enter these areas.

b/Transportation rates are based on Worldscale with conversion factors applied for the size of vessels used.

c/Rate represents the lowest cost alternative--going through the Suez Canal.

d/As discussed earlier in the report, extensive lightering at sea is not likely to occur because the procedure requires the most highly skilled vessel crews available due to its hazardous nature.

e/Data represents direct shipment charges because transshipment would not appear practicable from Venezuela under the assumptions made in this analysis.

Estimated Savings of a Deepwater Port over Direct Shipment, Lightering, and Transshipment

	Estimated transportation costs		
	Direct shipment	Trans-shipment	Light-ering
Alternative cost	$540,000,000	$461,000,000	$441,000,000
Deepwater port cost	377,000,000	377,000,000	377,000,000
Estimated saving in transportation cost	$163,000,000	$ 84,000,000	$ 64,000,000

Our hypothetical example shows the magnitude of savings that might be available through use of a deepwater port as compared with alternative transportation methods now in use. Presently, no one alternative shown is used exclusively and the transportation cost savings attributable to a deepwater port would be dictated by the mix of methods now used.

A deepwater port built to serve the Delaware Bay/New York area would cost about $350 million for a throughput of more than 1 million barrels of crude oil a day that would achieve the maximum economy of scale. The cost would be recovered through charges for using the port over a period of about 30 years.

Other potential advantages

In addition to the annual savings in transportation costs, reductions in ship traffic at the New York and Delaware Bay Harbors would occur. These two areas presently receive most of east coast oil imports. Controlling water depths in these two harbor areas limit tanker sizes to about 50,000 DWT. Assuming all 55 million DWT of crude oil (400 million barrels) were shipped in 50,000 DWT tankers, a deepwater port would eliminate about 1,000 oil tanker movements in these two harbor areas each year. This reduction represents a maximum size tanker fleet configuration delivering oil to these areas. In reality, there would be changes in the configuration of the tanker fleet used in our analysis. This would probably tend to further decrease harbor traffic. For example, lightering oil into barges to a level where the tanker could enter the harbor would decrease barge movement traffic.

Reductions of oil tanker movements in crowded and confined harbor areas can significantly reduce the environmental risks associated with oilspills. As previously stated,

Coast Guard data shows that of 51 collisions of oil tankers analyzed, 79 percent occurred in rivers, bays, estuaries, and harbors--a ratio of almost 4 to 1 for onshore/harbor to offshore mishaps.

Also, a study of 266 oilspills due to tanker accidents throughout the world shows that 66 percent of the accidents were the result of groundings, collisions, or rammings. 15/ According to the study, the most disastrous and most frequent spills resulted from groundings in the shoal approaches in harbors (70 percent of all groundings and collisions) and in the coastal zones (19 percent) where the tidal current could spread the oil as far as 9 miles in 3 hours; if the groundings or collisions occurred 20 miles offshore, the oil would be spread less than 1 mile in the same time period. The study also indicated that this difference is very important to removal or dispersion of oil before it reaches an estuary; moreover, the risk of grounding would all but be eliminated for large tankers delivering oil to offshore terminals in water depths of 100 to 120 feet.

Spills not only damage the environment but also kill fish and shellfish and make them unfit for human consumption. Spills are also expensive to clean up. For example, a recent spill of about 500,000 gallons of heavy fuel oil (about 12,000 barrels) in the St. Lawrence Seaway cost over $6.5 million to clean. Although larger ships have the potential for causing larger spills, and thus more environmental disruption, a recent study 16/ reported that worldwide data thus far does not indicate a general trend in that direction. However, these effects would be mitigated because they would occur about 20 miles or more off the coast and could be away from environmentally sensitive areas, such as bays and estuaries. In addition, tidal currents would have less effect on the spread of oil at this distance from shore. No correlation was found in the study between spill frequency, volume of spillage, or average spill size compared to the transporting vessel size.

There are other advantages associated with a deepwater port facility that we have not attempted to quantify in this brief analysis. Overall transportation cost reductions would improve the Nation's overall balance-of-payments situation because most imported oil is delivered by foreign flag vessels.

A deepwater port should also improve supply conditions by allowing delivery continuity. For example, imported oil demand is higher in the winter months when harbor traffic is likely to be most congested and oil delivery delayed when it is most needed.

One other potentially important benefit would be the use of this port for unloading refined products as well as crude oil. About 400 million barrels of refined products were shipped into the New York and Delaware Bay Harbors in 1974.

Using the deepwater port for refined products might require a separate unloading platform as well as a separate pipeline, but such a facility would also reduce harbor traffic and its associated environmental risks and possibly overall transportation charges. Batching techniques would allow multiproduct movement to shore by this refined product pipeline. Such techniques transport similar products together in a sequence that allows the commingled portions to be upgraded in quality.

There was not enough information about the economics of this alternative, but there is no doubt that the environmental advantages previously discussed for crude oil are equally applicable for refined products. Therefore, we conclude that this issue requires further study of the economics before a final position can be stated.

OBSTACLES AFFECTING THE FEASIBILITY OF AN EAST COAST DEEPWATER PORT

There are several potentially important constraints affecting the feasibility of an east coast deepwater port. Oil discovered on the mid-Atlantic Outer Continental Shelf (OCS) would provide a new domestic supply of energy resources and could conceivably back out some or all foreign imports to this area. One OCS sale (sale 40) has already occurred in the mid-Atlantic and at least two others are planned in the next 4 years. The U.S. Supreme Court recently let a decision of a U.S. Court of Appeals (2d Cir.) stand that upheld the validity of this sale and allows the exploration of leased lands to commence. The sale's validity had been questioned on environmental grounds. Very little is known about the overall resource potential of this area. Estimates of oil resources range from 400 million to 1.4 billion barrels of oil; however, this is based on very limited and unreliable technical data. 17/ Additionally, the first exploratory test well drilled in the area indicates that the area may be gas prone rather than oil prone. The lack of reliable knowledge about the resource potential of this OCS area increases such an investment's risk and hampers governmental policy decisionmaking in this instance.

Another potentially major impediment to the construction of a deepwater port is the possibility of antitrust actions. To be feasible, a deepwater port needs the backing, support, and commitments of oil companies. As such, oil companies are logical owners of a deepwater port. This, however, raises

concerns over these companies' increasing involvement in the energy field. However, the economics associated with a deepwater port do not allow competing projects to serve an area.

Another constraint that might delay a deepwater port is existing oil company charter fleet arrangements. In arranging for oil shipments, companies either own or routinely charter tankers for periods of several years. If such a port were built, existing charter arrangements and company-owned fleet configuration could preclude realization of maximum savings from such a port. However, a port would not be in operation for several years due to the planning, licensing requirements, and actual construction that could mitigate some of this effect.

CONCLUSIONS

Although deepwater ports and onshore heavy industrial developments have been opposed by some State and local governments in the mid-Atlantic, we believe that a deepwater port on the Mid-Atlantic coast may be in the national interest due to the environmental and economic benefits such a port could provide. Opposition has been largely based on concerns that

--oilspills will occur from large tankers and deepwater port operations and

--deepwater ports will precipitate the expansion of secondary industrial growth, such as refinery complexes.

Alternatives to deepwater ports and large tankers all produce increased vessel movements by smaller vessels. Studies show that 66 to 83 percent of oilspills from tankers occurred in rivers, bays, estuaries, and within coastal zones where the consequences for environmental and economic damage can be disastrous. The increasing numbers of vessels in these areas will increase the risks of future oilspills with attendant adverse effects. A deepwater port serving the mid-Atlantic coast would greatly reduce the risks of these oilspills because of the reduced vessel traffic, its location in uncongested waters several miles offshore, and use of a pipeline that is not affected by weather conditions or traffic patterns to carry oil onshore.

Deepwater ports may also provide major savings in crude oil transportation costs. Also, possible savings in refined product transportation costs may be achievable. These savings would not only be reflected in savings to oil companies

but would also have a favorable effect on the U.S. balance of trade and payments since most vessels are foreign flag registrations.

With respect to the concern that a deepwater port would precipitate the expansion of secondary industrial growth, we believe that existing Federal and State air quality regulations as well as State and local government land-use policies and practices can assist in controlling onshore secondary development.

Under the policy of passive Federal Government involvement, State and local governments in the mid-Atlantic, as well as industry, have to decide for themselves which transportation alternative(s) is most desirable from an economic and environmental perspective. The Federal Government, therefore, simply regulates the development and operation of such a port after it has been proposed. A likely result of no further efforts by the Federal Government to encourage deepwater port development is continued delay of such development. OTA recently concluded that a deepwater port would probably not be built to serve the mid-Atlantic in the next 10 years.

CHAPTER 5

ALTERNATIVES FOR DISTRIBUTING SURPLUS WEST COAST CRUDE OIL

By 1978 there may be 1.2 million barrels a day of Alaskan crude oil available for transportation to the continental United States. As much as 600,000 barrels a day could be surplus on the west coast, and it is highly unlikely that any of the proposed deepwater port and pipeline systems for moving surplus oil to other domestic markets can be constructed by 1978.

In addition to the problem of finding an acceptable method of moving surplus Alaskan crude oil to other domestic markets, there is also some uncertainty about the size and duration of the surplus. If oil reserves on the west coast and Alaska are not sufficiently increased by new discoveries in the near future, there may be little prospect of a long-term crude oil surplus on the west coast. Without a long-term surplus there may be little economic justification for constructing a west-to-east distribution system. Assuming that there will be a long-term surplus, we believe construction of a west-to-east deepwater port/pipeline distribution system would be in the national interest. At this time it is too early to tell if any of the proposed deepwater port/pipeline systems will be built because governmental agencies have not yet issued all the required permits to allow construction to begin.

When the Congress authorized construction of the Alaska pipeline, it was projected that all the Alaskan North Slope oil would be consumed on the west coast. There is now, however, growing evidence that there will be a crude oil surplus to west coast needs.

Production of Alaskan North Slope crude oil began during 1977 and is expected to reach a rate of 1.2 million barrels a day by 1978. The estimated crude oil surplus on the west coast is expected to range from 300 to 600 thousand barrels a day in 1978. Some primary causes for this estimated surplus follow.

--Demand for oil on the west coast is lower today than previously projected prior to embargo and subsequent price increases.

--Many west coast refineries have not been modified to process the higher sulfur Alaskan crude and therefore many continue to import low sulfur

foreign crude oil at the rate of about 500,000 barrels per day.

--The Federal Government has recently increased output capacity from the Elk Hills Naval Petroleum Reserve in California to over 100,000 barrels of crude oil a day and is mandated to increase capacity further to about 300,000 barrels a day in 1979. This oil is being sold in the west coast market.

Although some Alaskan oil may be surplus to west coast needs in the coming years, other areas of the country could use this oil and reduce their dependency on foreign imports. Large quantities of foreign oil are being imported to the east and gulf coasts which could be replaced by Alaskan oil. Also, Canada is enforcing a gradual reduction of crude oil exports to the United States with a complete stoppage planned by 1982. Many refineries in the Northern Tier States have been dependent on Canadian crude oil and could use Alaskan crude oil to help fill their declining access to Canadian sources.

The immediate problem is to find a way of distributing surplus west coast oil. The size and duration of the surplus are important variables to consider in planning the best means of distribution. At present, there is still some uncertainty as to the probable size and duration of the Alaskan oil surplus.

If substantial additional reserves are not found in Alaska and/or offshore California to augment known reserves, it is possible that the crude oil surplus expected by 1978 could begin to diminish in 2 to 3 years as demand rises and could disappear by the early 1980s. 1/ On the other hand, it is possible that the crude oil surplus could continue beyond the early 1980s if sufficient new oil is discovered, developed, and transported to the west coast in the near future. Much of the potential for future U.S. oil discoveries is in the far western States, including the waters off the California and Alaska coasts. Therefore, throughout the 1980s and possibly beyond, the west coast could be an oil supplier to other parts of the country. Exploratory drilling in the Gulf of Alaska and in offshore California during the next 2 years should give a better indication whether a long- or short-term west coast oil surplus will occur.

TRANSPORTATION ALTERNATIVES ASSUMING A LONG-TERM WEST COAST OIL SURPLUS

Various Government and industry officials believe that a combination deepwater port and pipeline distribution system would be the best way, from both an economic and environmental standpoint, to transport oil from the west coast to the Midwest and east coast over the long term. From a national security standpoint, a west-to-east pipeline system could provide a secure, high-capacity means of moving domestic oil between the west coast and other parts of the country. This could be particularly valuable in the event of any future foreign supply curtailments or some other national emergency.

A number of deepwater port terminal/pipeline transportation proposals are being considered. Four such projects include two trans-United States systems, one across the southwest and the other across the northwest; one through the United States and Canada; and one across Guatemala. The status of these projects is constantly changing, and it is difficult to remain current on them. We cannot determine which transportation proposals will be built because agencies have not completed all the environmental, economic, and political assessments that should be made before approving the construction and operation of these distribution systems. We favor legislation designed to expedite the issuance of required Federal approvals of transportation systems to move surplus Alaskan crude oil to Northern Tier and other inland States. At least one bill (S. 1868) has already been introduced to provide for expedited Federal review.

Standard Oil Company of Ohio proposal

The proposed Standard Oil Company of Ohio (SOHIO) project's purpose is to receive, transport, and distribute surplus west coast crude oil from Alaska and California to consumers in the Midwest, east coast, and gulf coast regions. This project calls for transporting crude oil by tankers from Valdez, Alaska, to Long Beach, California; constructing a marine terminal and local storage facilities in Long Beach; and developing a pipeline system from Long Beach to Midland, Texas. The pipeline consists of upgrading 670 miles of existing gas pipeline to transport crude oil and constructing 250 miles of new pipeline. This deepwater port and pipeline system is planned to accommodate crude oil at the rate of about 500,000 barrels a day for distribution to Midland, Texas, as well as about 200,000 additional barrels a day for distribution to existing refineries in the Los Angeles area.

SOHIO recently testified that the principal obstacle in its efforts to complete its proposed project was the California Air Resources Board's concern over the selection of Long Beach for the western terminal of its proposed pipeline. 2/ This agency has been concerned about the project's effect on air quality on Metropolitan Los Angeles. The board contends that evaporation of hydrocarbon vapors from onshore storage tanks and from the purging and ballasting of tankers in and near the Long Beach port area would cause an increase in photochemical oxident in the already polluted Los Angeles basin.

SOHIO believes that the air quality issue can be resolved through trade-offs and the use of best available technology. 3/ The Chairman of the California Air Resources Board has testified that it is doubtful that sufficient emission reductions could be obtained by SOHIO at an acceptable cost. 4/ Unless this problem can be mitigated to allow the timely issuance of required Government permits, the SOHIO project could be delayed. The State of California has also indicated that the conversion of existing gas pipelines could adversely affect California's natural gas supply and, therefore, has proposed that the SOHIO project either construct a new oil pipeline or assure that Alaskan or other natural gas is directed to California. One SOHIO official said that if Long Beach proved to be an unacceptable site, it could mean at least a 2-year project delay. SOHIO has testified that even if permits are issued in a timely fashion, the Long Beach-to-Midland pipeline cannot be completed and in operation for at least 1 year and, possibly, up to 18 months. The estimated cost of this proposal is about $1.94 a barrel for ocean transport, terminal, and pipeline costs.

Northern Tier Pipeline Company proposal

The Northern Tier Pipeline Company plans to construct a deepwater port facility at Port Angeles, Washington, capable of handling tankers up to 300,000 DWT. The company also plans to construct a crude oil pipeline about 1,570 miles long to connect Port Angeles with Clearbrook, Minnesota, and carry an ultimate capacity of 800,000 barrels a day. 5/

The Northern Tier deepwater port and pipeline system has been proposed to transport surplus Alaskan crude oil and some foreign oil to Northern Tier and other inland refineries where demand exists. The Northern Tier States, which are facing a gradual discontinuance of all Canadian

crude oil imports, could absorb 400,000 barrels a day of the proposed pipeline's throughput, 200,000 barrels a day of Alaskan crude, and 200,000 barrels a day of sweet (low sulphur) foreign imports. The remaining 400,000 barrels a day would be transported from Clearbrook to Chicago by an existing pipeline system. 6/

The Northern Tier Pipeline Company must obtain approval from the Governor of Washington and show that it can comply with applicable water and air pollution requirements. The company's application for site certification was officially accepted by Washington State in early August 1976. The proposal has experienced changes in the project participants. As of January 1978 these included several railroads, a pipeline company, a major steel producer, an oil company, and several consulting firms. These companies estimate that when started the Northern Tier project will require 24 months to complete; the estimated per barrel cost will be $1.47, but Department of Energy sources contend that this cost is too optimistic.

Transprovincial pipeline proposal

This Canadian deepwater port and crude oil pipeline proposal from Kitimat, British Columbia, to Edmonton, Alberta, and on to Chicago by existing pipelines was initially proposed in response to curtailments of traditional Canadian crude supplies to refineries in the U.S. Northern Tier States. The transprovincial pipeline would be capable of transporting 300,000 to 600,000 barrels a day (including Alaskan crude and imported low sulphur crudes) to meet refinery needs in the Northern Tier States and supplement the needs of the Chicago area.

This project could require up to 12 months for permit consideration because of the volume of crude and related tanker traffic and crude storage. 7/ The Federal Energy Administration reported in October 1976 that there are no unusual major barriers to permitting or financing associated with the transprovincial proposal. Construction, after permit receipt, is expected to take from 18 to 24 months.

This proposal appears to be in direct competition with the Northern Tier pipeline proposal. Refiners in Montana, North Dakota, Minnesota, Wisconsin, and Michigan are supporting the transprovincial proposal, and for Minnesota and northern Wisconsin it is reportedly the most economical way to receive Alaskan crude (though its cost is estimated

to be $1.67 a barrel). The Minnesota Energy Board, which also favors the proposal, has testified that environmental impact of the transprovincial route would be negligible because it would require no new construction in the States.

Because the transprovincial pipeline is a proposed Canadian route, there is a question of whether it is in the best interests of the United States to rely on a foreign distribution system to transport U.S.-owned oil. The Governments of Canada and the United States have recently entered into a treaty prohibiting discriminatory treatment of the hydrocarbons transiting either country. The treaty specifically:

--Prohibits impeding, diverting, redirecting, or interfering with pipeline throughput.

--Commits each party to facilitate the expeditious issuance of such permits, licenses, or other authorizations required for transiting hydrocarbons.

--Prohibits imposition of any fee, duty, tax, or other monetary charge on a transit pipeline unless it is also applicable to Canadian interprovincial pipelines and prohibits any tax on the transiting hydrocarbons.

--Provides additional guarantees of nondiscrimination against transit pipelines.

--Provides for arbitration.

The treaty was ratified by the Senate on August 3, 1977, and entered into force October 1, 1977.

Central American Pipeline Company proposal

The Central American Pipeline Company (CAPICO) has been planning since 1974 for a marine terminal and trans-Guatemala pipeline to provide an access for transporting Alaskan, U.S. outer continental shelf, and foreign crudes to U.S. gulf and east coast ports. The proposed pipeline would be 227 miles long and have a capacity of 1.2 million barrels a day. 8/

Project participants form an international group; this includes the proposed direct involvement by the Guatemalan Government. According to Department of Energy officials, projects of this kind have not been subject to extensive governmental permitting requirements, and there are no indications that this situation will change for this project.

The international considerations involved in this proposal are not clear. Guatemala and the United States enacted a treaty of friendship and cooperation in 1954. No treaty exists between Guatemala and the United States which specifically addresses the transportation of U.S.-produced and -owned crude oil across Guatemala.

According to Department of Energy officials, project proponents have indicated that the trans-Guatemala pipeline will be constructed regardless of U.S. Government action or construction of other pipelines. There reportedly appear to be no financial or political factors to prohibit construction. 9/ Construction is estimated to take 24 months. In terms of the west coast Alaskan crude oil surplus, the Department of Energy has estimated the cost to be $1.70 a barrel, but that the limiting factor on the value of this project is the insecurity of transporting crude across a foreign country.

Shipping through the Panama Canal

Although deepwater port and pipeline systems are probably the best long-term methods for transporting west coast crude oil to other parts of the country, it is highly unlikely that Federal, State, and local approval procedures will enable such a transportation system to be completed by the time North Slope production rises to the level at which west coast supply will exceed west coast demand. Therefore, since the President has excluded the possibility of exchanging surplus oil in the short term with Japan, other means of moving this oil to other U.S. markets will be necessary.

Crude oil shipment through the Panama Canal has already begun. The most critical question about the feasibility of the Panama Canal route to transport crude oil in excess of west coast requirements has been the adequacy of tanker availability.

The Maritime Administration determined that the existing and anticipated fleet of tankers eligible to engage in U.S. coastwide trade, augmented by U.S.-flag tankers now in foreign trade but capable of qualifying for the Jones Act */ trade, would be adequate to handle the expected west

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*/The Jones Act, as amended, (Merchant Marine Act, 1920, 46 U.S.C. 883) stipulates, with certain exceptions, that all trade in goods between one U.S. port and another be carried in ships of U.S. construction and ownership.

coast crude oil surplus when the Panama Canal route and lightering are used. Lightering would allow large (125,000-250,000 DWT) tankers used from Valdez to Panama to be offloaded at the canal to small (40,000-60,000 DWT) tankers able to transit the canal. 10/ The Maritime Administration determined that the canal's capacity was sufficient to carry crude oil at levels of 500 thousand to 1 million barrels a day.

The primary attraction of the canal route is that it can be implemented immediately. A significant drawback of this route is its high cost. According to a Department of Energy report, crude can be delivered to the gulf via the canal for $2.45 a barrel without the use of large tankers (the Department of Commerce estimates this cost to be $3.01 per barrel) and lightering and for $2.21 a barrel with lightering.

Like the proposed trans-Guatemala pipeline, the canal route poses security uncertainties not present in continental U.S. routes. The market for crude transported through the canal is very flexible. Alaskan North Slope crude could be marketed on the gulf or east coasts, backing out delivery of similar foreign crude. 11/

Another adverse effect of using the Panama Canal for transporting Alaskan crude oil would be the environmental disadvantage of having an increased volume of small tankers. As previously mentioned, increased coastal ship traffic and port congestion would increase the potential for ship collisions and oilspills, especially on the gulf and east coasts.

Shipment through the Panama Canal has already begun and presents no financial or engineering barriers; the higher cost and lower supply security associated with this option make it less attractive than transcontinental pipeline routes. In the short term, however, before the pipelines are built the canal presents an available means of carrying crude oil above west coast requirements to other U.S. markets.

CONCLUSIONS

Alaskan crude oil production is expected to reach 1.2 million barrels a day by 1978, and as much as 600,000 barrels a day could be surplus on the west coast. It is highly unlikely that any of the proposed deepwater port and pipeline systems could be constructed by that time. Assuming the surplus will be long term, we believe that

the construction of a west-to-east deepwater port and pipeline system would serve the national interest for distributing oil to midwestern and eastern markets. At this time, however, we cannot determine if any of the proposals will be built because agencies have not completed all the environmental, economic, and political assessments that should be made before approving the construction and operation of these distribution systems. To assist in overcoming these delays, we support legislation similar to S. 1868, which is designed to expedite issuance of required Federal approvals of transportation systems to move surplus Alaskan crude oil to Northern Tier or other inland States.

Surplus oil will probably be marketed in the short term by shipping oil through the Panama Canal to the gulf and east coasts. This will provide

--an almost immediate outlet for surplus Alaskan crude oil;

--the time necessary to determine whether the west coast oil surplus will continue long enough to make a proposed deepwater port and pipeline distribution system needed; and

--if a long-term surplus develops, the time necessary for an appropriate distribution system to be approved and constructed.

CHAPTER 6

AGENCY COMMENTS AND OUR RECOMMENDATIONS

Copies of the draft of this report were furnished to the Departments of Transportation, Energy, and Commerce for their comments. The Department of Transportation was unable to provide us with written comments within our requested time frame. We did, however, meet with officials of the Department of Transportation and obtained their informal comments. The Departments of Commerce and Energy did formally respond to the draft report and their comments are included in appendixes II and III. The report was revised in several sections to reflect technical comments we received. The following sections summarize the overall comments and present our views on those matters.

DEPARTMENT OF TRANSPORTATION

DOT said that an Atlantic deepwater port may be desirable. It stated that its Office of Deepwater Ports recently began to study the feasibility, cost, and benefits of such a port. Among the issues under study is an assessment of the demand for crude oil on the east coast. On the basis of this demand forecast, DOT will examine several alternatives to satisfy the expected requirements. Among the various alternatives being evaluated are:

--Offshore facilities off the coast of New Jersey which could conceivably feed refineries served presently by Delaware River and New York Harbor ports.

--An offshore terminal off the Delaware coast to feed the refineries along the shores of the Delaware River.

--An onshore facility like the one proposed previously inside Delaware Bay. (See p. 22.)

--The continuation of lightering and transshipping operations to deliver oil.

If DOT's research results indicate that a port is economically and environmentally justified, DOT plans to conduct a survey of industry and State and local parties to assess their interest and concerns about deepwater port development. Then DOT will attempt to assess the appropriate Federal role. This study is expected to be completed in spring 1978.

DOT further commented that using a deepwater port for petroleum product delivery to the east coast is more difficult to justify because of the increased geographic dispersion of products and markets. However, it feels this aspect should be studied and could be included in its ongoing effort.

DOT also told us that its estimates of Atlantic OCS oil production indicate that an east coast port may still be required. DOT said that the uncertainty of OCS production in the area reduces the possibility of locating the port in a manner that would also allow the port's pipeline to deliver Atlantic OCS oil to shore.

DEPARTMENT OF ENERGY

The Department of Energy (DOE) commented that because of limited refinery capacity on the east coast, the economic gains of a deepwater port in the mid-Atlantic area are not sufficient to justify a high-priority study of such a project. It also believed that many of the points in the study relate to energy policy and should be the responsibility of DOE, not DOT. Additionally, it noted that the Corps of Engineers conducted comprehensive studies of deepwater ports along all three U.S. coastlines in 1974. DOE noted that (1) since that time little has changed that would increase the advantages of an Atlantic coast port and (2) there is no evidence presented that sufficient new gains would result from such a port. DOE also commented that our report ignores the national goal of reducing imports drastically by 1985.

DEPARTMENT OF COMMERCE

The Department of Commerce stated that, in its opinion, the report does not adequately establish the desirability of a deepwater port on the mid-Atlantic coast. Commerce concludes this because economics, limitations on refining capacity, onshore secondary impacts, and the potential impacts of offshore oil finds in the mid-Atlantic are likely to preclude a crude oil daily volume flow needed to make such a port and its pipeline to the refinery area economically feasible.

Commerce acknowledges that there are environmental benefits attributable to reduced oil transport activities in rivers, bays, and estuaries. However, it notes that the savings should be compared to social and environmental effects of potential onshore heavy industrial development on onshore communities.

Commerce stated that considering the experiences of private industry in developing the LOOP and SEADOCK offshore terminal concepts in the gulf area, where circumstances are

more favorable to offshore terminals than on the Atlantic coast, and the fact that SEADOCK's future is still undecided lead to the conclusion that caution is advisable. Commerce also feels that recommending that DOT perform a comprehensive study appears to call for duplication of much of the definitive work already performed by various public and private groups by an agency with regulatory rather than promotional responsibilities in this area.

OUR RESPONSES TO COMMENTS

Overall, we believe that these comments clearly show the uncertainty about the potential for an east coast port and demonstrate the need for the definitive study we are recommending and which DOT has already begun to address in part. We disagree with Commerce's position that such a port is economically undesirable because of limitations on refinery capacity, potential mid-Atlantic OCS finds, potential onshore secondary impacts, and the increasing cost of building this facility in lieu of all these constraints on the facility's potential throughput.

DOT's and DOE's comments show that they view such a facility as potentially economically feasible. DOE highlighted the Corps of Engineers study in its response. 1/

Two conclusions of the Corps study were that deepwater ports were preferable to existing delivery conditions and that deepwater ports should be located in the North Atlantic to accept supertankers serving refineries in the area. The Corps analysis identified nine systems with average annual benefits ranging from $60 million to $80 million.

Additionally, another study was made for the Corps in 1972, 2/ which included an evaluation of the feasibility of an east coast deepwater port. Basically this overall study indicated that the savings in transportation costs from using supertankers on long hauls is great and could fully justify the cost of developing deepwater terminals. Examination of the various port proposals for the east coast showed favorable benefit-cost ratios for all the options considered, ranging from 25-1 to 10-1. The benefit-cost ratios varied between location and estimated throughputs. Additionally, the study concluded that not having the facilities available in the United States will only result in some form of transshipment with the attendant delivery of oil in smaller vessels and continued environmental risks.

In our October 14, 1977, report (EMD 78-5) examining the National Energy Plan, we conclude that the Nation's estimated reliance on imports in 1985 under the plan (6 million

barrels a day) is understated by about 100 percent. We believe that even if the Congress fully implements the plan, as the administration has requested, by 1985 the United States will have to import 12 million to 13 million barrels a day to avoid a shortfall. In the meantime, the Nation is going to be increasingly dependent on foreign oil.

The east coast is a highly populated, industrialized segment of the Nation that needs oil. Whether the oil coming to the east coast is crude or refined in 1985 depends on many variables; nevertheless, it will be coming in large part by ship. We believe that the oil should be delivered in a manner most beneficial to the economic and environmental interests of the Nation.

DOE commented that this report ignores the national goal of reducing imports drastically in 1985. We are on record as supporting the plan's objectives. We believe, however, that the plan is not designed to accomplish those objectives. However, even at a 6-million-barrel-a-day import level, an east coast port may provide environmental and economic benefits.

We do not believe it would be wise to avoid examining an east coast port's potential because of the constraint proposed by eventual Atlantic OCS finds. There has been only one OCS lease sale to date in the area. Opponents of the sale had questioned the validity of the sale on environmental grounds. The U.S. Supreme Court, however, recently let a decision of a U.S. Court of Appeals (2d Cir.) stand that upheld the adequacy of the environmental impact statement prepared for the sale by the Secretary of the Interior.

Thus, intensive exploration has not yet begun. Even after exploration begins, historically it has taken about 5 to 8 years from the initial finds until production commences and, with good fortune, about 10 years before substantial production could be expected. Thus, it does not appear likely that any significant production in the mid-Atlantic would begin before 1988. The present OCS leasing schedule shows two other mid-Atlantic sales, but these are not scheduled until 1979 and 1981. Therefore, to forego considering an east coast deepwater port on this basis does not appear prudent. Again, DOT's comments generally agreed with our conclusion.

Commerce's suggestion that the environmental benefits from reduced risk of oilspill be weighed against the potential heavy industrial development of onshore communities represents a valid concern that we have already addressed in our recommendations to DOT. We would also like to note that

there is some evidence 3/ indicating that the construction of deepwater ports in the Gulf of Mexico (LOOP and SEADOCK) will alleviate pressures for increased onshore development and their consequential environmental impacts on the east coast.

In summary, we do not believe it is advisable to take the approach recommended by Commerce. The alternatives available to deepwater ports are transshipment and lightering, which can achieve many of the economic benefits but do not provide the environmental advantages. Thus, rather than debate opponents of an east coast deepwater port, we believe, as does DOT, that the companies were willing to accept the more modest economics of transshipping and lightering. However, the increased demand for foreign oil that is projected by 1985 carries increased environmental risks in delivering this product.

The previous studies about east coast deepwater ports identified the potential benefits of such a facility and provided information about potential locations. They did not, however, attempt to formulate any methodology to solve existing concerns about onshore development or the financing alternatives for such facilities. Our analysis also indicates that other matters, such as using a deepwater port for receiving refined products, should be considered.

Previous studies and industry proposals generally have assumed refinery growth and expansion. Because of the attendant social and economic impacts of such onshore developments, we believe that a study is needed to examine the feasibility question based on maintaining levels of refinery capacity.

We support the study presently in progress by the Department of Transportation to evaluate the feasibility of an east coast port and realize that it is addressing to some extent many of the specific points in our recommendations. However, DOT's comments indicate that some matters discussed below have not been included in this effort, such as the feasibility of a refined products line running from such a port.

RECOMMENDATIONS TO THE SECRETARY, DEPARTMENT OF TRANSPORTATION

To provide the Congress with the latest assessment of the feasibility of an east coast deepwater port, we recommend that the Secretary of Transportation, with the cooperation and advice of the Secretaries of Energy and Commerce and

in coordination with other Federal, State, and local governments, private industry, and public interest groups, should complete a mid-Atlantic deepwater port study by December 31, 1978. The study should address the following points:

--Optimum location and number of deepwater ports in the mid-Atlantic area.

--Cost of constructing these ports at a size that could handle maximum crude oil throughput which is compatible with existing refinery capacity in the area.

--Potential for refined product use and, if viable, development of plans and cost estimates for port capability to reasonably handle foreseeable levels of refined products either coconstructed with the crude oil facilities or constructed as a discrete project.

--Procedures, regulations, and other legal arrangements necessary to assure that area deepwater port capacity for crude oil, built to serve existing refinery capacity, could not be expanded without meeting all the procedures and requirements that now apply to initial construction efforts.

--Requirements that all vessels unloading at the ports, and the ports themselves, use at least the best available pollution control technology, including provisions to incorporate reasonable technological advances into the regulations.

--Alternative financing and management options, including a public/private combination and all-public option if industry appears unwilling or unable to undertake such ventures on its own.

Within 6 months of the completion of the study, the Secretary of Transportation should submit a detailed plan to the Congress. The plan should identify a program to construct and operate a mid-Atlantic deepwater port, including additional legislative and funding authorities needed, unless the study finds that the economic and environmental benefits are outweighed by the costs or other factors identified in the study. If the study finds the port undesirable, the Secretary of Transportation should report this finding to the Congress and present his recommended option(s) for transporting imported oil.

RECOMMENDATIONS TO THE CONGRESS

The Congress should schedule appropriate hearings on the study's results.

Also, because we believe that west-east pipelines served by deepwater ports are the preferred transportation alternative for surplus Alaskan crude oil, the Congress should enact legislation to expedite the issuance of required Federal approvals of transportation systems to move surplus oil to Northern Tier and other inland States. At least one bill (S. 1868) has already been introduced to provide for expedited Federal review.

CHAPTER NOTES

CHAPTER 1

1/U.S. Department of Transportation, Coast Guard, "Draft Environmental Impact Statement, LOOP Deepwater Port License," Washington, D.C., 1976. Vol. 1, pp. 1. 2-7.

2/Marine Management, Inc., "Marine Transportation Study," Stamford, Connecticut, June 1, 1977.

3/U.S. Department of Transportation, Coast Guard, "Draft Environmental Impact Statement, LOOP Deepwater Port License Application," Washington, D.C., 1976. Vol. 2, pp. 8-7.

4/"Final Environmental Impact Statement, Deepwater Ports," (U.S. Department of the Interior: April 1974) Vol. I, pp. IV-49.

5/Ibid., pp. IV-49 and 51.

6/Ibid., p. IV-51.

7/Ibid., pp. IV-51 and 52.

CHAPTER 2

1/"Final Environmental Impact Statement, SEADOCK Deepwater Port License Application," (U.S. Department of Transportation, Coast Guard: Washington, D.C., 1976) Vol. 2, pp. 4-40.

2/"Final Environmental Impact Statement, Deepwater Ports," (U.S. Department of the Interior: April 1974) Vol. II, pp. IX-16 and 17.

3/"The Secretary's Decision on the Deepwater Port License Application of LOOP Inc. " (U.S. Department of Transportation· Washington, D.C., December 17, 1976) pp. 58-59.

CHAPTER 3

1/"Final Environmental Impact Statement, SEADOCK Deepwater Port License Application," (U.S. Department of Transportation, Coast Guard: Washington, D.C., 1976) Vol. 1, pp. 1-23.

CHAPTER 3 (continued)

2/Ibid., pp. 1-23.

3/Ibid., pp. 1-21.

4/"Final Environmental Impact Statement, LOOP Deepwater Port License Application," (U.S. Department of Transportation, Coast Guard: Washington, D.C., 1976) Vol. 1, pp. 1-36.

5/Ibid., pp. 1-10.

6/"Marine Transportation Study," (Marine Management Systems, Inc., Stamford, Connecticut: June 1, 1977).

CHAPTER 4

1/"Coastal Effects of Offshore Energy Systems: An Assessment of Oil and Gas Systems, Deepwater Ports, and Nuclear Powerplants Off the Coast of New Jersey and Delaware," (Office of Technology Assessment: November 1976) p. 40.

2/Projection of Use of Crude Oil Handling Facilites of Seadock, Inc," Sherman H. Clark Associates; July 1975; p. E-78.

3/Op. cit., An Assessment, et. al., p. 174.

4/Ibid., pp. 174-175.

5/"Working Papers: Coastal Effects of Offshore Energy Systems," (Office of Technology Assessment: November 1976) Vol. II, Working Paper #3, p. 14.

6/"Final Environmental Impact Statement, SEADOCK Deepwater Port License Application," (U.S. Department of Transportation, Coast Guard: Washington, D.C., 1976) Executive Summary, pp. 35-36.

7/Op. cit.,"An Assessment, et al.," p. 178.

8/Ibid.

9/Ibid.

10/Ibid., p. 187.

CHAPTER 4 (continued)

11/Ibid., pp. 179-180.

12/Ibid.

13/Ibid., pp. 180-183.

14/As reported in Petroleum Intelligence Weekly (PIW), March 8, 1976, p. 8.

15/"Final Environmental Impact Statement, Deepwater Ports," (U.S. Department of the Interior: April 1974) Vol. I, p. IV 52.

16/Henry, J.J. 1973. "An Analysis of Oil Outflows Due to Tanker Accidents," 1972. AD-780-315.

17/See EMD-77-51, June 28, 1977, for further information on OCS Sale 40. EMD-77-19, March 7, 1977, also discusses the OCS leasing program and policy.

CHAPTER 5

1/Statement of Lodwrick M. Cook, Vice President, Atlantic Richfield Company, before the Commerce Committee and the Committee on Interior and Insular Affairs, U.S. Senate, in Los Angeles, California, December 7, 1976., p. 5.

2/Statement of Joseph D. Harnett, Executive Vice President, The Standard Oil Company (Ohio), before the Commerce Committee and the Committee on Interior and Insular Affairs, U.S. Senate, in Los Angeles, California, December 7, 1976., p. 9.

3/Ibid.

4/Statement of Tom Quinn, Chairman, California Air Resources Board, and Special Assistant to the Governnor for Environmental Protection, before the Committee on Commerce and the Committee on Interior and Insular Affairs, U.S. Senate, in Los Angeles, California, December 7, 1976.

5/"Preliminary Engineering Design and Construction Cost Estimate, Northern Tier Pipeline System," (Butler Associates, Inc.: Tulsa, Oklahoma, June 8, 1976)., p. 2.

CHAPTER 5 (continued)

6/"North Slope Crude, Where To? - How?: An analysis of the alternatives available for the transportation and disposition of Alaskan North Slope Crude," (The Federal Energy Administration: October 8, 1976) Revised Draft, p. 248.

7/Ibid., p. 227.

8/Ibid., pp. 284-286.

9/Ibid., p. 286.

10/Ibid., p. 289.

11/Ibid., p. 291.

CHAPTER 6

1/"Atlantic Coast Deepwater Port Facilities Study," U.S. Army Corps of Engineers, Philadelphia District, North Atlantic Division, June 1973, pp. 78 and 109.

2/"U.S. Deepwater Port Study Summary and Conclusions," Volume I of V; Department of the Army, Corps of Engineers, August 1972, IWR Report 72-8.

3/Winter, Tobey L., Praegers, New York, 1972, "Deepwater Ports in the United States," p. 175.

Department of Energy
Washington, D.C. 20461

DEC 2 1977

Dear Mr. Canfield:

Thank you for giving the Department of Energy the opportunity to review the GAO draft report "Outlook for Deepwater Port Development in the United States." On behalf of James R. Schlesinger, Secretary of Energy, I am transmitting the Department's comments on the proposed study.

General Comments

One of the major recommendations of the report is that a major study be undertaken re: constructing a Mid-Atlantic-Coast deepwater port. Because of the limited refinery capacity on the East Coast, the economic gains of a deepwater port in the Mid-Atlantic area are not sufficient to justify a high priority study on such a project. Further, in 1974, the Corps of Engineers conducted comprehensive studies of deepwater ports along all three U.S. coast lines. Since that time, little has changed that would increase the advantages of an Atlantic coast port; the GAO report does not provide sufficient evidence of new gains resulting from such a port. It also ignores our national goal to reducing imports drastically by 1985.

With regard to West Coast oil, the study probably should refer to several various objective estimates of the projected surplus or deficit of crude on the West Coast.

[See GAO note, p. 52.]

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Specific Comments

[See GAO note, p. 52.]

P. 8 - GAO recommends that the Secretary of Transportation undertake a comprehensive mid-Atlantic deepwater port study. However, many of the substantive points to be addressed in the study are in the realm of energy policy, and should be the responsibility of DOE, not DOT (assuming the study is to be done at all). These points include the optimum location and number of deepwater ports in the Mid-Atlantic area, the determination of costs of constructing these ports at a size to handle maximum crude throughput compatible with existing refinery capacity, and determining the potential for refined product use.

P. 8 - In the discussion of oil spills, the report does not mention a possible relationship between tanker accidents causing spills and climatic conditions. Dense fog and severe storms are not uncommon along the Mid-Atlantic coast, particularly in winter. A discussion of this relationship is included in the Coast Guard studies of deepwater ports, done in 1973-1974, and should be referred to in this report.

[See GAO note, p. 52.]

P. 36 - The use of foreign flag vessels does not necessarily alter our balance of payments very much since many of these are flags of convenience vessels owned by multinational corporations. Some figures would be useful.

[See GAO note.]

The Department of Energy will be pleased to provide you with recent data or updated analysis, to remedy some of the above weaknesses in the draft.

Sincerely yours,

Alvin L. Alm
Assistant Secretary
Policy & Evaluation

Mr. Monte Canfield, Jr.
Director
Energy & Mineral Division
General Accounting Office
Room 5120
441 G Street, N.W.
Washington, D.C. 20548

GAO note: The deleted comments relate to matters which were discussed in the draft report but were either omitted or changed from this final report. Page references refer to the draft report and are not applicable to this report.

APPENDIX III

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Maritime Affairs
Washington, D.C. 20230

NOV 15 1977

Mr. Henry Eschwege, Director
Community and Economic Development
Division
United States General Accounting
Office
Washington, D.C. 20548

Dear Mr. Eschwege:

This letter is in response to yours of October 20, 1977 to the Secretary of Commerce, requesting comments on the U.S. General Accounting Office draft report entitled "Outlook for Deepwater Port Development in the United States." Major issues are discussed in the body of the letter with comments of a detailed nature attached.

In our opinion, the desirability of a deepwater port on the Mid-Atlantic coast is not adequately established in the draft report. This conclusion is based on economics, limitations on refinery capacity, onshore secondary impact, and potential market impact of offshore oil production. The crude oil daily volume needed to make a deepwater port and its pipeline to the refinery area economically feasible seems now to exceed the refinery expansion capabilities of the region. The market predictions in the report do not include the possibility that future production of oil on the Atlantic offshore continental shelf would detract from the oil imports to the Atlantic area. While the environmental benefit attributed to reduced oil transport activities in rivers, bays and estuaries is acknowledged, this factor should be compared to the social and environmental impact of potential onshore heavy industrial development upon onshore communities. It is believed that this consideration, which is an important issue in most analyses of the siting of deepwater ports, should be discussed in greater detail in the draft report.

Refinery capacity on the Atlantic coast has undergone minor expansion or remained at a substantially constant level in recent years. The major area of refinery expansion has been the U.S. Gulf and, to a lesser degree, the Pacific coast. The movement of petroleum products by tanker from the U.S. Gulf coupled with movement through two major product pipelines, Plantation and Colonial, to Atlantic coast markets appears to fulfill oil industry needs.

In the report, the deepwater port handling cost estimates for Venezuelan crude envision tankers from 160-320 MDWT. Venezuelan crude oil ports are generally constrained to handling tankers up to 50 MDWT. Thus, the tanker limitations would be dictated by the Venezuelan ports and not the

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deepwater port facility. Burmah Oil, one of the leading Caribbean transshipment companies has provided MarAd with the estimated delivered cost for Nigerian and Arabian crudes including transshipment to the U.S. Atlantic coast. The total cost is priced out at $217,000,000, some 36 percent lower than shown in the report. This reduced the estimated economic benefit of the deepwater port by about 70%. While this represents current conditions, higher numbers could be valid based on Required Freight Rate calculations for the 1982-1985 period.

Finally, the uncertainties in the petroleum market, i.e., future U.S. Outer Continental Shelf development, fluctuating cost of imported oil, ever increasing cost of offshore port development seem to create an unfavorable economic climate for deepwater port construction and operation.

Looking at the experience of private industry in developing the LOOP and Seadock offshore terminal concepts in the Gulf area where circumstances are more favorable to offshore terminals than on the Atlantic coast, the fact that the future of Seadock is still undecided leads to the conclusion that caution is advisable. Another consideration is the fact that the recommendation that the Department of Transportation should perform a comprehensive study appears to call for duplication of much of the definitive work already performed by various public and private groups by an agency with regulatory rather than promotional responsibilities in this area.

[See GAO note, p. 63.]

Sincerely,

Robert J. Blackwell

ROBERT J. BLACKWELL
Assistant Secretary
for Maritime Affairs

Enclosure

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COMMENTS ON GAO DRAFT OF
PROPOSED REPORT ON OUTLOOK FOR
DEEPWATER PORT DEVELOPMENT IN THE UNITED STATES

[See GAO note, p. 63.]

Transportation Cost Savings

The GAO Report states that transportation cost savings appear possible with a deepwater port in the mid-Atlantic area. One Delaware Bay Study, in particular, addresses this issue quite comprehensively.

The Penjerdel Corporation, a tri-state association of business, industry and professions serving the Delaware Valley, published a study, Oil Port Update in May 1975. The study raises several issues relating to crude oil transportation costs which should, we believe, be part of any economic analysis of deepwater ports, in addition to transportation cost savings to the oil companies. The most significant of these issues are the following:

1. Pipeline construction costs (labor), cost of steel, cost of rights of way.

2. Costs of terminal construction in terms of inflation. (Example: The Delaware Bay Transportation Company estimated $193 million of initial cost to build terminal plus pipeline in 1971; $400 million in 1978.)

3. Compensation to the States for use by private interests of offshore and onshore resources. (Example: 1% of the crude oil market value has been suggested as reasonable compensation.)

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4. Dredging costs. (Example: The Penjerdel Study estimated between $30 and $40 million to dredge 15 to 20 million cubic yards of bay bottom.

Transshipment Analysis

	DWT of Crude Oil Shipped	($ Million) GAO Total Trans. Cost	($ Million)[1] MarAd Total Trans. Cost
Venezuela	13,500,000	$ 46	$ 46[2]
Nigeria	22,300,000	170	109[2]
Saudi Arabia	9,100,000	89	62[2]
Transshipping fee ($.27/barrel x 145 million barrels)		39	
	TOTAL	$344	$217

1/ Based upon cost information from Burmah Oil
2/ Delivered price including transshipment

The total cost as provided by a recognized industry leader is 36 percent lower than the GAO presentation. The significance of this substantial differential is that it serves to undermine the economic desirability of deepwater ports. Tanker rates are variable. Higher numbers could be valid for a future period when foreign rates have recovered - probably 1982-1985. A proper procedure would be to use Required Freight Rate calculations, properly described.

Oil Refinery Capacity

The most limiting factor determining deepwater port development in the Delaware Bay area as the GAO Report suggests is the existing and proposed capacity of the seven Delaware River Valley oil refineries. The information received from the Delaware Deepwater Terminal Committee indicates that except for the recently completed expansion and modernization of the Standard Oil Refinery at Trainor, Pennsylvania, none of the existing refineries plan an expansion during the next 15 years. This would limit the throughput, needed at a deepwater port, serving this refinery complex to 800,000 bbls/day.

Furthermore, according to Penjerdel, no workable system seems likely to include extending the proposed pipeline from the deepwater port to serve the Exxon and Chevron refineries in northern New Jersey which would justify a larger throughput for the deepwater port. Separate waterborne

delivery will be needed for these refineries as well as Amoco's Yorktown, Virginia refinery.

In essence, taking into account inflation's effects on construction and operation costs "the crude-oil daily volume at which a port/pipeline facility has enough 'driving force' to make the facility worthwhile may retreat upwards and out of reach or to the point where the required volume far exceeds the refinery-expansion capabilities of the region." (See Oil Port Update, Penjerdei Corporation, May 1975)

Other issues not addressed in the discussion of refinery capacity in the GAO Report are the further limiting factors of water supply and air quality on refinery expansion. (Example: A September 1976 Hydrologic Geologic Study by the Water Resources Center of the University of Delaware describes the northern Delaware area serving the refineries as a water-short area.)

Environmental Benefits of Reductions in Ship Traffic

The GAO Report (p. 34) states that in addition to the annual savings in transportation costs, reductions in ship traffic at the New York and Delaware Bay harbors would occur. The Delaware Deepwater Port Committee reports that there are more than twenty four specialty carriers, barges, dry cargo, bulk carrier, container-ships and warships sailing the river daily, which will continue to use the bay and river regardless of the deepwater port. The 800,000 bbls/day refinery capacity could be handled by two or three 50,000 DWT tankers which can be accommodated now at refinery docks. Thus, as far as the Delaware Bay site is concerned, the reduction of traffic and accident risk to benefit the environment may be limited.

Oil Spills

The Coast Guard data, cited on page 35 of the GAO Report, notes a ratio of almost 4 to 1 for onshore/harbor to offshore oil spill mishaps of 51 collisions of oil tankers analyzed.

A worldwide study (not identified) showed that the most disastrous and frequent spills resulted from groundings in the shoal approaches in harbors (70%) and in the coastal zones (19%).

Since reduction of the risk of oil spills is one of the major reasons suggested for the U.S. Government's support of deepwater ports, we believe more precise data on reasons for oil spills, existing and proposed methods of oil spill prevention, behavior, control and cleanup should be addressed in the GAO Report before any final recommendations are offered. At a

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minimum, more specific information is needed on the potential of the larger ships to cause larger spills with more environmental disruption and the consequences of such spills.

Onshore Impacts of Deepwater Port Development

Although the environmental character of the Delaware coastline (i.e., limited water supply, high water tables, and large areas of protected wetlands precluding development) seems to limit onshore development in Delaware which might be generated from a deepwater port, onshore heavy industrial development is an important issue in most analyses of the siting of deepwater ports and its impact on onshore communities.

Since all Federal, State and local permits to construct and operate a deepwater port depend, in varying degrees, on satisfactorily meeting and mitigating economic, environmental, and social problems, the potential impacts of onshore development should, we believe, be discussed in greater detail in the GAO Report.

Finally, no discussion on Deepwater Ports is complete, we believe, without consideration of the value of productive coastal areas (natural areas, recreational lands, spawning-nursery fishing areas, etc.) and the impact of increased oil transport activity on these resources.

An estimate of the cost of losing or altering these areas with the construction of pipelines, tank farms, oil refineries, petrochemical plants, and related increased population densities, should be compared with the potential benefits to water quality and coastal areas by a possible reduction of oil spills.

[See GAO note, p. 63.]

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[See GAO note, p. 63.]

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A deepwater port may be desirable on the Mid-Atlantic Coast and in the national interest due to the environmental benefits such a port could provide. We suggest there are also environmental costs associated with such a port development particularly in an area where environmental quality as we know it is approaching scarcity.

The fact that financial support for a deepwater port off Texas is still in doubt indicates that when all factors are considered, the economic benefits projected in the draft report may not tell the whole story.

[See GAO note, p. 63.]

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We suggest that the complete mid-Atlantic deepwater port study include environmental costs and benefits as well as construction costs to provide a more complete array of alternatives.

[See GAO note, p. 63.]

Page 5, paragraph 3

The significant environmental advantage envisioned by deepwater ports should be balanced against the loss that would occur with development of onshore facilities such as the tank farm depicted in Figure IV-42.

Page 9, paragraph 3

While we agree that, in matters of foreign or interstate commerce, such as the importing of oil for the Nation, statutory authority may rest with the Federal Government, we feel the State has the authority as to the location of facilities within its area of jurisdiction.

Page 11

While environmental risk attributable to lightering includes accidental oil spills due to faulty transfer operations, a greater risk in terms of size of individual spills, would be that resulting from possible casualties as result of increased traffic on congested waterways.

Page 14

Active planning applies to Louisiana only. The future of the Texas deepwater port is still a question.

[See GAO note, p. 63.]

Page 22, paragraph 2

In our view the report does not present enough convincing evidence to state that one deepwater port on the mid-Atlantic coast would be in the national interest due to environmental and economic benefits. Economic costs and environmental costs have not been thoroughly examined within the confines of this report.

We suggest that this conclusive type statement be modified as we feel that outcome (result) of the proposed complete study would or should determine the advantages or disadvantages in the national interest of a deepwater port in the mid-Atlantic area.

Page 27, paragraph 1

This paragraph again provides a statement that environmental advantages of deepwater ports far out weigh those of other transportation alternatives. We suggest that insufficient information exists within this report to draw such a conclusion.

[See GAO note, p. 63.]

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Page 36, paragraph 1

This paragraph indicates that environmental effects would be mitigated in that they occur about 20 miles or more off the coast and away from enviromentally sensitive areas. Mere distance from these areas is only one factor which must be considered. The severity of effects also depend on wind (speed, direction), currents, and mass water movements. Biologically productive areas are also found more than 20 miles off the coast.

Page 40, paragraph 4

The concern that a deepwater port would precipitate the expansion of secondary industrial growth cannot be fully alleviated by stating that existing regulations, land use policies and practices can assist in controlling this development. The concern still remains.

Page 54

Believe Department of Energy estimate of $2.45 is low; this office estimates $3.01, and is in agreement with the $2.21 for low.

[See GAO note, p. 63.]

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GAO note: The deleted comments relate to matters which were discussed in the draft report but were either omitted or changed from this final report. Page references refer to the draft report and are not applicable to this report.

PRINCIPAL OFFICIALS RESPONSIBLE FOR ADMINISTERING ACTIVITIES DISCUSSED IN THIS REPORT

DEPARTMENT OF COMMERCE

	Tenure of office From	To
SECRETARY OF COMMERCE:		
Juanita Kreps	Jan. 1977	Present
Elliot L. Richardson	Feb. 1976	Jan. 1977
Rogers C.B. Morton	May 1975	Feb. 1976
Fredrick B. Dent	Feb. 1973	Apr. 1975
ASSISTANT SECRETARY OF COMMERCE FOR MARITIME AFFAIRS:		
Robert J. Blackwell	Aug. 1972	Present
Andrew E. Gibson	Dec. 1970	July 1972

DEPARTMENT OF TRANSPORTATION

SECRETARY OF TRANSPORTATION:		
Brock Adams	Jan. 1977	Present
William T. Coleman, Jr.	Mar. 1975	Jan. 1977
John W. Barnum (acting)	Feb. 1975	Mar. 1975
Claude S. Brinegan	Feb. 1973	Feb. 1975
COMMANDANT, U.S. COAST GUARDS:		
Admiral Owen W. Siler	May 1974	Present
Admiral Chester R. Bender	June 1970	May 1974
DIRECTOR OFFICE OF DEEPWATER PORTS:		
Lonell Johnson (acting)	May 1977	Present
Ernest T. Bauer (acting)	Feb. 1977	May 1977
John E. Lescroart	Sept. 1975	Feb. 1977

DEPARTMENT OF ENERGY

SECRETARY OF ENERGY:		
James R. Schlesinger	Oct. 1977	Present
ASSISTANT SECRETARY FOR POLICY AND EVALUATION:		
Alvin L. Alm	Oct. 1977	Present

(00140)