UNITED STATES GEN[illegible]COUNTING OFFICE
WASHINGTON, D.C. 20548

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ENERGY AND MINERALS
DIVISION

B-207583

May 21, 1982


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The Honorable Bill Bradley
United States Senate

Dear Senator Bradley:

Subject: Feasibility and Cost of Interim Storage for the Strategic Petroleum Reserve (GAO/EMD-82-95)

As part of our ongoing study of options for building, holding, and using private oil stocks, requested by your letter of July 31, 1981, your office has asked for information concerning the feasibility and cost of interim storage for the Strategic Petroleum Reserve (SPR) managed by the Department of Energy (DOE). Since our review of private storage options is not yet complete, the data and analysis set out here are preliminary; however, we anticipate that our calculations will be subject only to minor revisions. This report also builds on information and analysis presented in a recent letter report to the Chairman of the House Subcommittee on Fossil and Synthetic Fuels, Committee on Energy and Commerce. 1/

In the interest of timely release of this report, Senator Bradley requested that GAO not seek agency comments.

Our calculations indicate that an SPR fill rate of 300 thousand barrels per day (MBD) beginning in FY 1983 and continuing until the SPR contains 500 million barrels (MMB) will require interim storage during FY 1983-1985. The peak 1-year requirement will be approximately 69 MMB in FY 1984. Our inquiries at DOE and among industry sources also suggest that temporary storage in the form of steel tanks and/or tankers will probably be available at costs ranging from about $1.20 to $3.65 per barrel per year. We estimate, therefore, that an interim storage program to meet the goals mentioned above, given DOE's estimates of future oil prices, would cost from about $0.7 billion to $1.1 billion over 4 years. These estimates include storage costs and incremental debt financing of both storage and accelerated oil purchases. In comparison to the present DOE plan, an interim storage program would result in budget additions in fiscal years 1983 and 1984 and reductions in fiscal years 1985 and 1986.

1/"Leasing Storage Capacity for the Strategic Petroleum Reserve," EMD-82-62, March 12, 1982.

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Numerous studies have shown that emergency oil reserves can pay for themselves many times over in the event of an oil supply disruption. A larger SPR achieved sooner will increase the reserve's deterrent and insurance value during the next 3 years. Our analysis shows that if the price paid for SPR oil (including transportation) were to increase to $46-49 per barrel in fiscal years 1985 and 1986--from an estimated $37-39 per barrel in 1983 and 1984--the savings from buying the oil earlier would offset the costs of temporary storage at $1.20 per barrel annually--compared to DOE's current SPR plan. If storage costs as much as $3.65 per barrel, an increase in the price of SPR oil to $52-56 per barrel in 1985-1986 would offset temporary storage costs. Therefore, apart from any disruption during the next several years, accelerated SPR purchases could lead to a net economic benefit depending upon the future price of oil.

OBJECTIVES, SCOPE, AND METHODOLOGY

Section 4 of S. 2332 1/ requires the President, subject to the availability of funding, to fill the SPR at an average annual rate of at least 300 MBD beginning July 1, 1982, to maintain this rate until 500 MMB are in storage. Since development of permanent salt dome storage facilities does not permit such a high fill rate, the proposal raises several questions:

--How much temporary storage is needed to permit a fill rate of 300 MBD?

--Is sufficient temporary storage space available and in what form?

--What would be the additional cost of such storage?

--What changes in the price of oil could offset the added cost of temporary storage?

This report addresses these questions. To identify how much temporary storage is needed, we used information presented in the recently issued GAO report cited above. Concerning the availability and costs of temporary storage, we examined pertinent studies prepared by industry and the Department of Energy, considered recent testimony by experts on the subject, and spoke with numerous officials in the Federal Government and industry. Our method for estimating the costs of a temporary storage program and what changes in the price of oil would offset that cost is discussed in detail below, along with the results. Our audit work was conducted in accordance with our current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

THE NEED FOR TEMPORARY STORAGE

Enclosure 1 shows (1) the SPR fill schedule based on a fill rate of 300 MBD until a 500 MMB SPR is achieved, (2) the current

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1/A bill to amend the Energy Policy and Conservation Act to extend certain energy programs for other purposes.

fill schedule as permanent storage space becomes available, and (3) the resulting gap between available permanent storage and SPR fill at the 300 MBD rate. We assume that practical considerations associated with initiating a temporary storage program would delay implementation of the 300 MBD rate for several months. Because of this and to simplify storage and financial calculations, we assume that the accelerated storage rate begins in fiscal year 1983. Therefore, interim storage will be needed from fiscal years 1983 through 1985, with a peak 1-year requirement of 69 MMB in 1984. Actual capacity requirements for each year could vary depending on exactly when oil deliveries are made and when SPR permanent storage becomes available for absorbing the temporarily stored oil.

IS ADEQUATE SPACE AVAILABLE FOR TEMPORARY STORAGE NEEDS?

Steel tanks and tankers are the two principal means available for interim storage. Together they should provide sufficient capacity for the amounts of oil required. Each may present problems which are discussed below.

The need for segregated storage

If SPR oil is to be stored temporarily in private storage, the stocks should, in our judgment, be placed in segregated facilities. Such stocks require careful, periodic monitoring--to show whether the proper quantities and qualities of oil are maintained. If SPR stocks were integrated with industry's normal operating stocks, they would be extremely difficult and costly to monitor. Furthermore, integrating private and public stocks could enable companies to reduce their normal operating stocks by making use of the Government's oil. This could offset much of the value of an accelerated SPR stock buildup.

Availability of steel tankage

It is difficult to tell at any point in time exactly how much tank space might be available for temporary oil storage. The U.S. petroleum industry is complex, consisting of hundreds of companies involved in producing, importing, gathering, refining, and transporting oil. Oil storage occurs at each of these points. Consequently, a firm figure on how much space could be made available for temporary storage would require a detailed current survey.

The National Petroleum Council (NPC) periodically makes the most comprehensive surveys of storage capacity and inventory in the Nation's primary petroleum distribution system. 1/ The most

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1/National Petroleum Council, "Petroleum Storage and Transportation Capacities, Inventory and Storage," Vol. II, December 1979.

recent one, reported on storage activities for 1978. At that time NPC concluded no significant amount of underutilized storage capacity existed. In April 1981, the NPC reviewed the findings of its 1979 analysis with regard to crude oil storage capacity. This review confirmed the previous analysis.

Recent experience, however, suggests that the NPC's conclusion may have been overly conservative. As a result of the 1979 Iranian oil supply shortfall, primary oil stocks in the United States (excluding SPR oil) rose to a peak of 1357 MMB in August 1980--177 MMB more than in August 1978. 1/ This demonstrated the industry's capability to hold considerably more stock than the 1978 NPC figures indicated. Since stocks have been declining during the past year, some of this capacity could be available for interim storage. Primary stocks in March 1982 were down 100 MMB from the March 1981 level.

In 1981 Exxon conducted a study of U.S. and world primary oil inventories, with subsequent analysis of the U.S. primary inventory system through the end of 1981. 2/ Company officials we spoke with said that by the end of 1981 total U.S. petroleum inventories were about normal and that the U.S. system did not have excess storage capacity. The officials said that 50 MMB of existing crude oil inventories might be available for strategic purposes. However, they cautioned that very little of this could be segregated since it was scattered in many locations, integrated with working stocks, and moving through the storage system (i.e., not in the same place over time).

Several other studies have estimated the space that might be available for additional oil storage. A DOE October 1981 draft report on options for accelerating strategic oil stockpiling found that no more than a few million barrels of existing excess tank storage capacity could be segregated from the tanks used for private operating inventories. However, the report said that if industry reduced its inventories to historical levels, 40 to 50 MMB of segregated tankage (apparently for crude oil alone) could be available. The DOE conclusions were based on a study by Science Applications, Inc.

In February 1982 the Aerospace Corporation provided DOE with a draft report analyzing U.S. private sector petroleum storage capacity. Using DOE Energy Information Administration (EIA) data for 1976 to 1981, the study estimated potentially available capacity at major refineries, bulk terminals, and pipelines. The

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1/The figures include primary product stocks held at refineries, in pipelines, and at major bulk terminals, and crude stocks held at refineries, in pipelines, and in lease tanks. Tanks account for most storage. The NPC figures for 1978 show steel tankage accounted for 75 percent or more of total storage space.

2/Exxon Corporation, "World Oil Inventories," (August 1981).

60 largest U.S. refineries, 62 largest pipeline and bulk terminals holding crude oil, and the 36 largest petroleum product bulk terminals were examined. The study identified potential spare capacity of about 109 million barrels, 26 MMB for crude oil and 83 MMB for refined products. These results, however, must be interpreted with caution. Because of limitations in the original data, Aerospace could not fully quantify results on a company-by-company and site-by-site basis.

On February 10, 1982, DOE issued a request for proposals (RFP) for short-term storage of DOE crude oil. It asked interested companies with available storage capacity to indicate whether they would be willing to lease capacity and how much they would lease to DOE for periods up to 6 months. In addition, the RFP invited companies to make proposals for storage up to 1 year. Respondents indicated that as much as 65 MMB of domestic tankage might be available for leasing. Moreover, the companies offered 32 MMB of tankage and 19 MMB of underground storage in foreign locations. These potentials add up to 116 MMB--considerably more than the peak interim storage requirement of 69 MMB. In addition, DOE received proposals offering up to 99 MMB of storage in foreign flag tankers. The total offers for all forms and locations of storage were 215 MMB.

These figures represent a maximum potential, as the solicitation was only for a basic ordering agreement. Of 30 companies that responded, all but one submitted bids that took exception to one or more of the clauses in the solicitation. These differences would have to be negotiated and compromises reached before storage could be obtained. According to a DOE official, while the response was surprisingly favorable, actual storage secured might be only 30 percent of the maximum potential. Finally, and most important, these offers are for periods too short for using temporary storage for the program examined here. As Enclosure 1 indicates, temporary storage would be required for about three years for 21 MMB, two years for another 13 MMB, and two years for 35 MMB. A critical question, then, is to what extent do the results of the response to DOE's solicitation reflect available storage capacity for longer periods of time? The DOE official we spoke with felt that less storage would be offered for the longer term because companies would not want to give up long-term flexibility.

Other indications, however, show that considerable tank capacity for periods up to several years may be available. For example, in March 1982 a representative of the Independent Fuel Terminal Operators Association testified before the House Subcommittee on Fossil and Synthetic Fuels that their members could make 12 MMB of long-term storage available, much of it for crude oil. In a subsequent discussion with GAO, an official of the Association said this tankage could be segregated. He also estimated that 20-30 MMB of excess tank capacity probably exists at bulk terminals and refineries in the Northeast alone.

To summarize, it is not clear exactly what amount of segregated steel tankage could be made available for temporary SPR storage, what kind of storage (i.e., crude versus various product types), and for how long. Some sources suggest that little capacity could be had. However, other sources, as well as analysis of data on storage over the past several years, indicate that substantial capacity might be available. If the location is restricted to the United States, a possible range is anywhere from 10-25 MMB to 100 MMB or more. Allowing storage in tanks in foreign countries could significantly increase this figure.

What is needed to resolve this ambiguity is a formal U.S. Government request for interim storage proposals that would specify the minimum acceptable quantity offers, type (crude versus product, quality factors), time periods, location requirements, and so forth. In our opinion, such a solicitation should also explore whether some capacity might be made available if the Government were prepared to purchase surplus oil inventories currently being stored by particular companies. In other words, it should ask whether oil for the SPR could be purchased in tanks that could then be leased to the Government. This procedure might free up additional tank space that otherwise would not be available.

Availability of tankers

If the Government is prepared to consider storing SPR oil in surplus ocean-going tankers, enough capacity can probably be secured in this form alone to meet all temporary storage requirements. As discussed shortly, however, tanker storage raises several problems that would have to be solved.

Because of the decline in oil demand, the market for very large crude carriers (VLCC's) 1/ is depressed and is expected to continue declining well into the future. In fact, by 1990, only one-half of the 750 vessel VLCC fleet is expected to be employable. Some of the surplus is being absorbed by slow steaming, making multiple stops, and spending longer time in port; the remainder is sitting idle or going for scrap. In 1980, 26 VLCC's went for scrap; 23 more through mid-1981; in September 1981, 10 tankers were scrapped and 67 entered inactive files. The scrapped tankers alone had a capacity to hold roughly 100 MMB of oil.

According to the Maritime Administration, in November 1981, 164 ships over 100,000 deadweight tons (dwts) were inactive worldwide. This total equates to nearly 300 MMB of excess storage capacity as shown in table 1.

1/Tankers of 175,000 deadweight tons or greater.

Table 1

Inactive Tankers Over 100,000 Deadweight tons (Dwts)
November 1981

Number of Dwts (000's)	No. ships	Total dwts (000's)	Barrels (000's) (Note a)
100-124	10	1,125	8,213
125-174	13	1,185	13,250
175-224	24	5,203	37,982
225-299	91	27,990	167,827
300+	26	9,917	72,394
Total	164	41,050	299,666

a/ GAO calculation. Assumes 7.3 barrels per dwt.

According to the Transportation Institute, if one includes capacity absorbed in slow steaming, over 80 million deadweight tons (over 600 MMB) are available in the large crude carrier categories most suited for storage capacity.

The Coast Guard has found that as ships age, safety and pollution hazards increase. However, most of the 164 generally inactive ships are relatively young. Only three were built before 1967; 42 were built in 1967-71; 108 in 1972-76; and 11 in 1977 and later. Officials with whom we spoke in both Government and industry believe many of these ships would meet U.S. environmental standards.

Temporary oil storage in tankers is common in industry, although not for the length of time that would be needed for SPR temporary storage. Nearly one-half of the 164 ships referred to above have been used for short-term storage. As of September 1981, about 227 MMB of oil were being stored in tankers worldwide; about 82 MMB were in the Gulf of Mexico and the Caribbean. In addition, the Japanese Government has been storing about 60-70 MMB of emergency reserves in tankers for time periods comparable to those necessary for temporary storage of SPR oil.

Tanker storage is subject to ownership, environmental, and safety problems. Nearly all the surplus ships available for leasing are foreign flag. If the Government were to store substantial quantities of SPR oil on foreign flag ships, U.S. labor unions might argue that some or all of the ships should carry American crews. U.S. crews, however, are more expensive, a factor which could affect the costs of leasing tankers. Other drawbacks for tanker storage are the risks of environmental pollution and sabotage. Nevertheless, in spite of these risks private industry stores and transports large volumes of oil on tankers every day.

The risk of damage should there be an environmental accident or some other incident would be lessened if the tankers were anchored in favorable locations. For example, anchoring in the the Gulf of Mexico would put the tankers in U.S. waters; the Gulf has relatively mild weather most of the year; and the major U.S. oil distribution system is centered there. Large tankers would have to anchor far from shore, but the oil could be landed through the Louisiana Offshore Oil Port (LOOP) system. Perhaps more serious are Gulf environmental hazards such as hurricanes and the many oil and gas pipelines and oil rigs which would have to be avoided. Nevertheless, most officials suggested that the Gulf could accommodate tanker storage even in hurricane season; if the engines were operating, tankers could be moved quickly when necessary. Alternatively, the Caribbean also may be suitable. It currently accommodates tankers of 280,000 dwts carrying Alaskan oil.

A question exists as to whether storage of oil in tankers would require environmental impact studies. Coast Guard officials with whom we spoke said that a large-scale tanker storage program would require a 2-month environmental assessment and a 1-year preparation of a programmatic environmental impact statement. S.2332 would eliminate the need for such actions. It states that "no action related to the storage of petroleum products in existing facilities for interim storage in the Strategic Petroleum Reserve shall be deemed to be a 'major Federal action significantly affecting the quality of the human environment' within the meaning of that term as it is used in section 102(2)(C) of the National Environmental Policy Act of 1969."

WHAT WOULD BE THE ADDED COST OF INTERIM STORAGE?

The costs of a temporary storage program are the cost of leasing the storage space, including financing, and the cost of financing the oil purchased during the life of the program. The cost of oil itself is not considered an added cost, since the oil would eventually be purchased under the regular program. If oil prices rise between the time it is purchased for the interim program and the time it would have been purchased for permanent storage, some or all of the additional costs of the storage program would be offset.

Leasing rates for storage vary widely by location, length of contract, volume of oil, and product type. For example, a DOE draft report of October 1981 reported estimates for leasing steel tanks ranging from $1.20 per barrel per year, to a high of $3.96. For tankers, it reported estimates ranging between $1.46 to $3.28 per barrel per year. The report noted that the existence of distinct geographical markets for storage capacity results in leasing costs that vary by region and are highly volatile. The report concluded that the price of leasing storage facilities to the Federal Government would be in the $2.50 to $3.50 per barrel range. Two months later, however, some DOE officials said that

they believed DOE could lease between 10-30 MMB of steel tank capacity at about $1.80 per barrel per year. In early March 1982, a representative of the Independent Fuel Terminal Operators Association cited a figure of $2 per barrel per year as a rate at which members of the Association would be willing to lease steel tank storage space.

Recently, several lower estimates for leasing tanker storage have been publicized. On March 25, 1982, the President of the Petroleum Industry Research Foundation told the Senate Energy and Minerals Resources Subcommittee that large tankers can be leased at a cost of $1.20-1.80 per barrel per year. On April 26, 1982, the DOE Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness provided the same figures to the House Interior Appropriations Subcommittee. A few days earlier, the Chief Economist for Standard Oil Company (Indiana) told the Senate Energy and National Resources Committee that tanker storage could be secured for $1.00 per barrel annually. In a subsequent discussion with GAO, he estimated that up to 100 MMB of tanker storage could be available at that rate.

The wide variation in estimated leasing rates requires a prudent approach in assessing the added costs of interim storage for SPR oil. As enclosure I shows, the proposed interim storage program will require storing from 34-69 MMB over a few years. Even if there is more than adequate surplus storage capacity to handle such needs, a decision by the Federal Government to lease such an amount could exert upward pressure on storage price. Until the Federal Government requests and receives bids on specific storage capacity proposals, the actual price for which storage can be had will be uncertain. If the capacity surplus is really as large as some have suggested, the competition of companies to lease space will hopefully keep rates down. We believe that a request for bids on both tankers and steel tanks could help secure low rates because of the large surplus of tankers.

For this report, we used estimates ranging from $1.20 per barrel per year to $3.65 to illustrate the possible costs of temporarily storing SPR oil. Using these figures, enclosure II shows the costs to the Government of a temporary storage program.

We assumed that leasing rates would remain constant over the 1982-84 period. This seems reasonable considering that most forecasts assume flat demand over the next several years. To calculate the costs of financing both storage and the cost of purchasing the oil we used Data Resources, Inc.'s, (DRI) forecasts of Treasury security interest rates for 1982-83 (12.5 percent). We assumed that FY 1983 oil prices are set in the first quarter of FY 1983 and that FY 1984 prices are set in the first quarter of FY 1984. For the cost of oil purchased for temporary storage, we used prices for SPR oil provided in the administration's FY 1983 budget (i.e., approximately $37.00 per barrel in

1983, and $39.00 in 1984). These figures include transportation costs. 1/ To estimate net benefits of buying the oil earlier, we used the budget's forecast of oil prices in fiscal years 1985 and 1986 ($41 and $43 respectively) to calculate what the same amount of oil would cost then.

Enclosure II shows that the estimated total costs to the Government of a temporary storage program range between $690 million and $1.14 billion. The lower figure assumes storage can be secured for $1.20 per barrel annually; the higher figure assumes storage costs $3.65 per barrel per year. The table also shows separate figures for storage and debt financing costs. The costs for storage facilities range between $181-551 million. Charges for borrowing the money to finance the storage over the 3 years range between $39-118 million. The largest added expense is the cost of debt to purchase the oil for temporary storage--estimated at $773 million.

Enclosure III shows what the oil itself would cost the Government, if it were purchased in 1983 and 1984 at prices ranging between $37.00-$39.00. This amount, however, must be offset by what the oil would cost if purchased later as part of the regularly scheduled SPR program, since the oil would eventually be purchased anyway. Consequently, figures for the cost of oil in 1985 and 1986 are expressed as negative. The fact that the cost of oil figure in the total column on the right hand side of the table is also negative shows that there are net savings of about $300 million by buying the oil sooner. These estimated savings substantially offset the other estimated costs of the temporary storage program.

WHAT OIL PRICE INCREASES WOULD OFFSET THE COSTS OF TEMPORARY STORAGE?

As indicated in the above discussion, if oil prices increase quickly, the increased value of oil bought earlier for temporary storage would help offset the costs of temporary storage--making the action a good financial investment.

1/Transportation costs vary, of course, depending upon where the oil is bought, shipped to, volume, and so forth. Companies which bid on contracts to deliver oil to the SPR program frequently state an overall price without breaking out transportation charges. According to a DOE official, recent typical rates for shipping crude to the U.S. Gulf of Mexico on foreign flag vessels from the North Sea, North Africa, West Africa, and Persian Gulf, ranged between $.90-1.20 per barrel. Oil shipped from Mexico to the Gulf cost about $.35-.40 per barrel. The Cargo Preference Act, which requires that 50 percent of SPR oil be shipped in U.S. flag vessels, can increase transportation costs by 2-3 times or more. In its FY 1983 budget the administration calculated that the Cargo Preference Act would increase the average price of oil purchased for the SPR by about $1.00 per barrel.

How much would oil prices have to rise to break even on the added cost of temporary storage? While other assumptions are possible, we confine our discussion to the estimates of costs previously discussed--i.e., leased storage costing between $1.20 and $3.65 per barrel per year. In all cases we cite price changes needed to offset the full costs of the program above DOE's current SPR plan: storage charges, financing the storage and oil, and the net cost of the oil.

Enclosure III shows that the price of oil would have to reach about $46 in 1985 and $49 in 1986 to offset fully the added costs of temporary storage--at storage facility costs of $1.20 per barrel per year. This means that the price of oil must increase about $10 per barrel between fiscal years 1983-84 and 1985-86. If the cost of leasing storage facilities were $3.65 per barrel annually, the price of oil would have to increase to $52-56 per barrel by 1985-86 to break even. This would represent an increase of about $17 per barrel.

Our analysis assumes, as is shown in enclosure III, that oil bought for temporary storage costs from $37.00 per barrel in 1983 to $39.00 in 1984 (including transportation charges). However, in a soft oil market, such as has been witnessed recently, it may be possible to realize substantial savings on 1983 oil purchases. During much of the past year spot market oil prices for key OPEC (Organization of Petroleum Exporting Countries) crude oils have been selling at substantially lower prices compared to official sales prices. Discounts reached peak levels in March 1982. For example, according to Petroleum Intelligence Weekly's World Oil Price Index, in March 1982 spot market prices for Middle East light crudes and African light crudes were running about $5 below average official prices ($29.00 versus $33.85 per barrel and $31.50 versus $36.65, respectively). 1/ If oil bought for temporary storage could be secured at a substantial price advantage, oil prices would have to rise even less to offset the added costs of temporary storage. Thus, if the world oil market remains soft during FY 1983, and the 34 MMB of oil purchased in that year were obtained at a $4 price advantage, the price of oil would only have to rise to $46 in 1986 (instead of $49) in the $1.20 case.

The critical question, of course, is what future oil prices will be. This is impossible to predict with any degree of certainty. Since the Arab oil embargo of 1973-74 efforts by numerous forecasters, including offices within the U.S. Government, to estimate future oil prices have frequently been very wide of the mark. However, to provide some perspective on how high prices

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1/"Spot Crude Market Dives Despite Formal Saudi Output Cut," Petroleum Intelligence Weekly, March 15, 1982, pp. 5-6. "Spot Market Slumps Below $30 A Barrel PIW Index Shows," Petroleum Intelligence Weekly, February 22, 1982, pp. 3-4 "Key OPEC Crude Oil Price Trends at a Glance," Petroleum Intelligence Weekly, May 10, 1982, p. 8.

would have to rise to offset the estimated costs of temporary storage, enclosure III provides figures on three alternative price forecasts recently made by DRI. 1/ DRI's baseline forecast shows that oil prices for 1985 and 1986 would come close to those needed to offset the estimated costs of temporary storage. DRI's high price alternative shows prices in 1985 and 1986 that exceed the break-even prices both for the $1.20 case (by far) and $3.65 case. 2/ If a price advantage of $4 per barrel were secured in 1983, the program would more than pay for itself under DRI's baseline forecast for the $3.65 per barrel storage case.

According to DRI, the high price forecast would require some non-trivial supply disruption in the Middle East. It does not, however, envision a major Middle East disruption, for in this case prices would be considerably higher.

The DRI low price forecast reflects higher long-term price elasticities for energy and higher production of oil than the base case. DRI assigned a subjective probability of 10 percent to this case. Of course, such low prices would not offset the costs of temporary SPR oil storage.

THE BENEFITS OF TEMPORARY STORAGE OF SPR OIL

Thus far, our report has concentrated on the added financial costs of temporary SPR oil storage. To place this analysis in proper perspective, it must be remembered that the purpose of the Strategic Petroleum Reserve is to provide broad economic and national security benefits to the Nation--not to make money speculating in crude. These benefits are realized in two ways. First, a substantial SPR may help to deter oil embargoes that could be targeted against the United States and other major oil importing countries. Second, in the event that an oil supply interruption occurs, for whatever reason, drawdown of emergency oil reserves can significantly reduce the adverse economic and other consequences that accompany a loss of oil. Among the economic effects of an interruption are reduced GNP, and increased inflation and unemployment. At some point these economic impacts become serious enough to threaten important political and national security interests of the Nation as well.

Of course, if there were a substantial international oil supply disruption after oil was put in temporary storage, the resulting increased oil prices would much more than offset the added temporary storage costs. For example, the 1979 Iranian oil

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1/"U.S. Oil Outlook," Data Resources, Inc., Energy Review, Spring 1982, pp. 61-83.

2/Assuming that purchase prices for SPR oil for temporary storage are as shown in enclosure III.

supply interruption saw the average OPEC official crude oil direct sales price increase by $10.63 between the fourth quarter of 1978 and the fourth quarter of 1979. By the end of 1980, it was up an additional $9.00. Concerning possible future shortfalls, the EIA recently estimated that a substantial OPEC oil supply disruption in 1983--on the order of 6 MMBD--could result in a $75 per barrel price. 1/

Numerous studies have shown that emergency oil reserves can pay for themselves many times over in the event of an oil supply disruption. A larger SPR achieved sooner will increase the Reserve's deterrent and insurance value during the next 3 years. Congress needs to consider these benefits in deciding whether to fund the added costs of temporary storage.

I hope this information will be of use to you and other members of the Senate Energy Committee and the Congress in your deliberations on these important energy and national security issues. As arranged with your office, we plan to distribute the report at this time to other interested parties. We are continuing to work on the study of private stocks based on your initial request and will keep in touch with your staff as our work progresses.

Sincerely yours,

J. Dexter Peach
Director

Enclosures - 3

1/U.S. Department of Energy, "1981 Annual Report to the Congress," February 1982, Vol. 3 (DOE/EIA - 0173 (81)/3), pp. 5-12.

ENCLOSURE I

Temporary Storage Needed to Fill the SPR at a Rate of 300 MBD Until the SPR Reaches 500 MMB

(By Fiscal Year) (Million barrels) (note a)

	1983	1984	1985	1986	1987	1988	1989	1990
Total SPR storage needed at 300 MBD b/ Fill rate until 500 MMB c/ SPR is achieved	d/ 377	486	e/ 504					
Planned availability of permanent storage (FY 1983 budget)	343	417	456	538	598	623	670	750
Temporary storage needed to meet 300 MBD fill rate	34	69	e/ 48					
Transfer of temporarily stored oil into SPR permanent facilities			f/ 21	48				

a/Numbers rounded off to nearest whole number.

b/MBD - thousand barrels per day

c/MMB - million barrels

d/At the end of fiscal year 1982 the SPR is scheduled to contain 267 MMB of oil. A fill rate of 300 MBD equals 109.5 MMB per year.

e/It is necessary to store 504 MMB in 1985 instead of 500 for the following reasons. Available permanent storage in 1985 is 456 MMB, which means only 44 MMB of temporary storage is needed to reach 500 MMB. However in 1984, 69 MMB is temporarily stored. To reduce that to 44 MMB, 25 MMB of permanent storage must be used. As explained in footnote f, only 21 MMB is available for receiving oil from temporary storage. Therefore an additional 4 MMB of oil must be temporarily stored in 1985.

f/Under a 5-year contract with PEMEX, Mexico's state oil company, about 18 MMB of oil is to be delivered for permanent storage in 1985 (50 MBD). In 1985, 39 MMB of new permanent storage for the SPR is to become available. Assuming that the 18 MMB of oil from PEMEX is deposited in the SPR in fiscal year 1985, only 21 MMB of oil in temporary storage can be put into permanent storage that year.

ENCLOSURE I

Estimated Government Expenditures for Temporary Storage of SPR Oil
(note a)

(millions of $)

Temporary storage costs (fiscal years)	1983	1984	1985	1986	Total
Cost of storage facilities at $1.20-3.65 per barrel per year	41-124	83-252	58-175		181- 551
Costs for debt financing of storage facility costs	5- 16	16- 49	18- 54		39- 118
Costs of debt financing of oil purchase	157	348	268		773
Subtotal	203-297	446-648	343-497		993-1442
Cost of Oil (note b)	1258	1365	(861)	(2064)	(302)
Net expenditure	1461-1555	1811-2013	(518)-(364)	(2064)	691-1140

a/Calculations based on figures reported in enclosure I. Does not include costs for any additional program or administrative expenses that the SPR Program might incur. Assumes that 34 MMB of oil is purchased in the first quarter of FY 1983; that 21 MMB of that is temporarily stored for 2 years and the other 13 MMB for 3 years. The table assumes that 35 MMB of oil purchased in FY 1984 is temporarily stored for 2 years.

b/Assumes prices for SPR oil are as contained in the administration's FY 1983 budget, but are rounded off to nearest dollar (i.e., $37.00 per barrel in 1983; $39.00 in 1984; $41.00 in 1985 and $43.00 in 1986). The negative amounts in 1985 and 1986 show the outlays which would not have to be made in the regular SPR program since the oil was bought in 1983 and 1984.

ENCLOSURE II

ENCLOSURE III

Oil Price Changes Needed to Break Even on the Costs of Temporary Storage

($ per barrel)

Fiscal year	Oil selling price needed in 1985-86 to break-even if storage leasing costs are: $1.20 per Bbl per year	$3.65 per Bbl per year	Assumed prices for SPR oil purchases (note a) ($/Bbl)	Three recent alternative oil price forecasts by Data Resources, Inc. (note b) High	Baseline	Low
1983	—	—	37	41	36	29
1984	—	—	39	47	39	29
1985	46	52	41	53	44	30
1986	49	56	43	60	50	32

a/These assumed prices are from the administration's FY 1983 budget. The prices include transportation costs, and a differential to reflect the added costs of SPR compliance with the Cargo Preference Act. Figures are rounded to the nearest dollar.

b/Import prices to the United States. Data Resources, Inc., "Energy Review," Spring 1982, pp. 61-84; and DRI Energy Service Simulation.