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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

B-203117

MAY 4, 1981

The Honorable James^{A.} McClure
Chairman, Committee on Energy
and Natural Resources
United States Senate

SEN 06300

The Honorable John^{D.} Dingell
Chairman, Committee on Energy
and Commerce
House of Representatives

HSE 07000



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Subject: [Status of Strategic Petroleum Reserve
Activities--April 1981] (EMD-81-85)

This is the fifth in a series of status reports requested by members of the Senate Committee on Energy and Natural Resources and the House Committee on Energy and Commerce on the administration's activities to implement title VIII of the Energy Security Act. (See enc. II for the July 23, 1980, letter requesting these reviews.) Title VIII requires the President to resume filling the Strategic Petroleum Reserve (SPR) at an average rate of at least 100,000 barrels per day for fiscal year 1981 and succeeding years.

Our most recent report on the status of SPR fill activities (EMD-81-49, Feb. 24, 1981) noted that, for the first time since passage of the Energy Security Act, the Government had issued a solicitation to acquire oil above the minimum 100,000-barrels-per-day requirement. The report also noted that assuming a fill rate of 300,000 barrels per day beginning in June 1981, the Department of Energy (DOE) will not have enough storage capacity under its existing expansion plans to maintain this rate beyond July 1982.

On March 18 and 30, 1981, we testified before the Subcommittee on Fossil and Synthetic Fuels, House Committee on Energy and Commerce, and the Subcommittee on Energy and Mineral Resources, Senate Committee on Energy and Natural

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Resources, respectively, on the adequacy of SPR storage capacity and on DOE's fiscal year 1982 SPR budget request. As you know, for fiscal year 1981 DOE has requested a \$1.3 billion supplemental appropriation, and for fiscal year 1982, \$3.7 billion for oil acquisition. DOE proposes to use these funds to achieve 207,000 and 230,000-barrels-per-day fill rates during these years. In our testimony we stated that, although DOE plans to have sufficient storage capacity to support these fill activities, it would have to adhere to a tight schedule to keep pace with a 300,000-barrels-per-day rate.

This report is based on our review of DOE and Defense Fuel Supply Center (DFSC) SPR program documents, and of publications and studies related to the program. We also interviewed officials in DOE and DFSC. We did not verify the volume of oil received by DOE nor the available capacity of SPR storage facilities.

Between our February status report and April 24, 1981, three major events have taken place:

- On March 31, 1981, DFSC, DOE's oil purchasing agent, completed its fifth round of contracts under the January 1981 open continuous solicitation. In response to the solicitation, DFSC has contracted for about 39 million barrels of oil to be delivered to the SPR during this fiscal year. These contracts bring total oil acquired for the SPR for fiscal year 1981 to about 75 million barrels, which is equivalent to an average fill rate of about 205,000 barrels per day for the entire fiscal year. So far this fiscal year, oil fill has averaged about 183,000 barrels per day. According to DOE, as of April 20, 1981, about 130 million barrels of oil were stored in caverns and other SPR facilities. (See enc. I.)
- On April 15, 1981, {DOE transferred to DFSC the remaining unobligated SPR oil funds} Of the \$4.0 billion available for fiscal year 1981 purchases, contracts valued at \$2.9 billion have been awarded. (See enc. I.)
- On April 24, 1981, DOE's Deputy Assistant Secretary for the SPR announced that SPR oil purchases were being suspended for about 30 days. According to DOE and DFSC officials, market prices for the types of crude offered to the SPR have been declining

since the March 31, 1981, round of awards and they expect this trend to continue. DOE hopes to take advantage of the expected lower prices by delaying additional oil purchases for about 1 month. We believe other factors also could have influenced DOE's decision to temporarily suspend oil purchases. Existing facilities cannot receive more oil than is already under contract for delivery through June 1981. The suspension will give DOE more time to bring on line usable storage capacity. Also in April 1981 the Oil Minister of Saudi Arabia publicly called for oil consuming countries to temporarily postpone building up oil inventories until after discussions of oil prices are completed by the Organization of Petroleum Exporting Countries (OPEC). OPEC representatives are scheduled to meet on May 25, 1981.

Our February 1981 SPR status report and subsequent testimonies noted that 32 million of the 249-million-barrel Phase I storage capacity 1/ will not be ready to receive oil deliveries until July of this year. The 32 million barrels of capacity consist of an 8-million-barrel storage cavern involved in the September 1978 fire at West Hackberry and the 24-million-barrel Sulphur Mines facility. At West Hackberry, DOE has identified potential sources of pressure leaks in two of the cavern's three wells and is continuing work to locate leakage at the third well. DOE hopes to identify remaining leakage, retest the cavern for pressure losses, and have it ready for storage by July 1, 1981. At Sulphur Mines, DOE plans to test wells and caverns and to successfully complete a series of start-up tests before the facility is ready to receive oil.

DOE has recently revised its schedule for the Sulphur Mines facility. DOE now plans to bring the Sulphur Mines facility on line in phases, with 11.5 million barrels of capacity becoming available during July and another 13.1 million barrels becoming available during August 1981. (See table 4 of enc. I.)

1/As of April 20, 1981, DOE statistics based on sonar tests indicate the capacity of existing underground storage caverns is 251 million barrels.

CONCERN OVER PRESSURE
BUILDUP AT WEEKS ISLAND MINE

Since our February report, a potential storage capacity problem has emerged at DOE's Weeks Island salt mine. Pressure building up from gases in the mine now limits the amount of oil that can be stored. ED

Unlike salt caverns, pressure within the Weeks Island mine increases as the volume of oil stored increases. Caverns are filled with oil and/or salt-saturated water, or brine. Pressure in the caverns is maintained at a constant level during oil fill by removing brine displaced by incoming oil. At Weeks Island, on the other hand, inert, non-combustible gases were injected into the mine to dilute the combustible hydrocarbon gases introduced into the mine during oil fill. As the mine is filled with oil, the incoming oil compresses the gases, causing pressure to build up.

Excessive pressure within the mine could cause fumes to escape around the mine seals and, in the presence of a spark, cause a fire. The mine was designed to withstand from 15 to 30 pounds per square inch of pressure. However, the maximum pressure recorded in a test of the mine's seals was equivalent to 7 pounds per square inch. According to DOE estimates, this is equivalent to the pressure which would be experienced when the mine is filled with about 20 million barrels of oil.

DOE's design for Weeks Island calls for installing a system to release pressure by venting and flaring the gases. The Louisiana Air Control Commission has approved the proposed venting and flaring; however, DOE currently has only the capability to vent the gases. According to its January 1981 estimate of SPR receiving capabilities, DOE planned to have a vent and flare system installed by July 1981. The July 1981 milestone correlated to DOE's earlier estimate of when the Weeks Island facility would contain 18 million barrels of oil.

However, proposed SPR delivery schedules for contracts awarded in response to the open continuous solicitation now call for delivering oil to Weeks Island sooner than DOE anticipated. As of April 20, 1981, the mine contained about 13 million barrels of oil. The contracts' proposed delivery schedules would bring the volume of oil stored at Weeks Island to 20 million barrels by about May 15, 1981, and to about 27 million barrels by July 1, 1981.

DOE officials believe they can provide a temporary solution to the pressure buildup by May 15, 1981. They plan to put a temporary flaring system in place by that date. However, DOE has also requested that the Louisiana Air Control Commission approve by May 15, 1981, temporary venting of the gases without flaring.

If DOE meets its May 15, 1981, schedule for relieving pressure within the mine, oil fill can continue as planned. If it does not, DOE will be faced with the decision of whether to extend oil storage volume beyond the 20-million-barrel level originally tested at the facility, or to delay oil fill. DOE officials stated that, in the event a flaring system cannot be installed before they reach the 20-million-barrel level, they would vent the gases before allowing pressure to build up to a level at which the mine's seals could be damaged.

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As requested, we will continue to periodically report on the status of SPR oil fill. These reports will provide updated information and will include comments on the progress and problems associated with fill activities. Some of the information and issues identified in these reports will be subject to further review during subsequent months, and will be reported on in greater detail as work is completed. Several issues identified to date warrant such treatment. These include the effectiveness of DOE's (1) management of problems affecting the readiness of SPR facilities to receive oil, (2) internal controls for measuring the amount of oil received and stored in the SPR, and (3) efforts to expand SPR storage capability, or to acquire alternative storage capability.

In order to meet the requested reporting time frames, we did not obtain official agency comments. We are also sending copies of this letter to the Ranking Minority Members of the Senate Committee on Energy and Natural Resources and the House Committee on Energy and Commerce. As requested by your office, we plan no further distribution of this report

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until 10 days after its date of issuance. At that time we will send copies to the Department of Energy and other interested parties and make copies available to others upon request.

for 
J. Dexter Peach
Director

Enclosures - 2

*Douglas
McCullough*

Tables and Graphs on the Status of
The Strategic Petroleum Reserve

Table

- 1 Summary of SPR contracting activities
- 2 Contracts awarded under open continuous solicitation
- 3 Volume of SPR oil stored in caverns and other facilities
- 4 Status of Phase I SPR storage capacity
- 5 Status of Phase II SPR storage capacity
- 6 Status of funding for the SPR

Figure

- 1 Projected availability and utilization of SPR storage capacity
- 2 Projected availability and utilization of SPR storage capacity assuming alternative fill rates

Table 1
Summary of
SPR Contracting Activities

<u>Activity</u>	<u>Number of contracts</u>	<u>Value of contracts</u> (millions)	<u>Date of contracts</u>	<u>Volume of oil contracted for</u>	<u>Oil delivered as of 4/20/81</u>	<u>Remaining Deliveries (note a)</u>		
						<u>Third quarter FY '81</u>	<u>Fourth quarter FY '81</u>	<u>First quarter FY '82</u>
----- (millions of barrels) -----								
Competitive Exchange	6	\$1,441.5	9/18/80 to 10/31/80	36.6	30.0	5.1	1.2	b/ 0
Open Continuous Solicitation	10	<u>1,473.9</u>	2/13/81 to 3/31/81	<u>38.6</u>	<u>7.7</u>	<u>26.6</u>	<u>4.6</u>	c/ 0
Total	<u>16</u>	<u>\$2,915.4</u>		<u>75.2</u>	<u>37.7</u>	<u>31.7</u>	<u>5.8</u>	<u>0</u>

a/Based on DOE's projections of oil cargoes to be received.

b/For the 6 contracts, oil delivered plus DOE's projection of remaining deliveries is about 300,000 barrels less than the volume of oil indicated on contracts. According to a DFSC official, DFSC has the option of accepting less than the contracted volumes and reducing proportionately the amount paid to the contractor. For each contract, if the volume remaining after the last scheduled delivery is less than the volume that can be shipped economically, DFSC may exercise its option and accept less than the contracted volume.

c/Oil delivered plus DOE's projection of remaining deliveries is about 300,000 barrels more than the volume contracted for. The contracts allow companies the options to deliver up to plus or minus 10 percent of their contracted volumes of oil.

Table 2
Contracts Awarded Under
Open Continuous Solicitation

	Total barrels to be delivered (millions)	Contract date	Total daily fill rate	Type of oil (note a)	Delivery dates	
					First	Last
Amoco Oil Co.	.7	2/13/81	1,918	Sweet	5/81	5/81
Derby and Co., Inc.	7.6	2/13/81	20,822	Sweet	3/81	6/81
	8.2	(note b)	22,466	Sour	4/81	6/81
British Petroleum Oil Development, LTD	5.2	2/20/81 (note c)	14,247	Sweet	4/81	6/81
Motor Oil Hellas	.9	2/20/81	2,466	Sweet	3/81	3/81
Houston Oil and Refining, Inc.	3.4	3/06/81	9,315	Sweet	5/81	7/81
	1.5	(note d)	4,110	Sour	6/81	6/81
Listo Energy, Inc.	.6	3/06/81	1,644	Sweet	4/81	5/81
	1.0	(note e)	2,740	Sour	5/81	6/81
Coral Petroleum, Inc.	2.0	3/10/81 (note f)	5,479	Sweet	4/81	5/81
Coastal States Trading, Inc.	.7	3/13/81	1,918	Sweet	7/81	8/81
	.6	(note g)	1,644	Sour	3/81	4/81
Amerada Hess Corp.	2.0	3/31/81	5,479	Sweet	6/81	6/81
U.S. and S.A. Enterprises, Inc.	4.2	3/31/81	11,507	Sour	4/81	5/81
Total	38.6		105,755			

a/Sweet crude for the SPR is defined as having less than 0.5 percent sulfur content; sour crude is defined as having more than 0.5 percent sulfur content.

b/February 13, 1981, contract was modified on 2/20/81, 3/6/81, and 3/31/81 to increase the volume of oil to be delivered from .7 million barrels to 15.8 million barrels.

c/February 20, 1981, contract was modified on 3/13/81 to increase the volume of oil to be delivered from 1.875 million barrels to 5.2 million barrels.

d/March 6, 1981, contract was modified on 3/31/81 to increase the volume of oil to be delivered from 1.9 million barrels to 4.9 million barrels.

e/March 6, 1981, contract was modified on 3/31/81 to increase the volume of oil to be delivered from .6 million barrels to 1.7 million barrels.

f/March 10, 1981, contract was modified on 3/31/81 to increase the volume of oil to be delivered from 1 million barrels to 2 million barrels.

g/March 13, 1981, contract was modified on 3/31/81 to increase the volume of oil to be delivered from .6 million barrels to 1.3 million barrels.

Table 3
Volume of SPR Oil Stored in
Caverns and Other Facilities

<u>GAO</u> <u>reporting</u> <u>period</u>	<u>Volume</u> <u>of oil at</u> <u>start of period</u>	<u>Deliveries</u>	<u>Volume</u> <u>of oil at</u> <u>end of period</u>	<u>Average receiving rate</u>	
				<u>For</u> <u>reporting</u> <u>period</u>	<u>Since</u> <u>9/23/80</u> <u>(note a)</u>
		(millions of barrels)		(barrels per day)	
9/23/80 to 1/31/81	91.2	b/ 21.3	112.5	162,595	162,595
2/1/81 to 4/20/81	112.5	17.1	129.6	216,456	182,857

a/DOE completed receiving the first shipment of oil resulting from the fiscal year 1981 competitive exchange on September 23, 1980.

b/Deliveries include 641,490 barrels of Elk Hills Naval Petroleum Reserve oil delivered to the SPR via pipeline by Pacific Refining Company.

Table 4
Status of Phase I SPR Storage Capacity

<u>SPR site</u>	<u>Capacity constructed</u>	<u>Capacity ready to use (note a)</u>	<u>Volume of oil in storage as of 4/20/81</u>	<u>DOE's estimated completion date for additional capacity</u>	<u>Brief description of work to be done</u>
	(millions of barrels)				
Weeks Island, LA	75.0	20.0	13.0	May 15, 1981-- 55 million barrels	System to vent and flare gases which build up during oil fill must be completed.
Bayou Choctaw, LA	41.5	41.5	26.2	Completed	None
Sulphur Mines, LA	24.6	0	0	July 1981-- 11.5 million barrels	Caverns and wells to be recertified in phases.
				August 1981-- 13.1 million barrels	Initial tests of pipes, computer controls, and other equipment to be completed.
West Hackberry, LA	48.2	40.5	40.3	July 1, 1981-- 7.7 million barrels	Wells and cavern involved in September 1978 fire to be recertified.
Bryan Mound, TX	<u>61.8</u>	<u>61.8</u>	<u>50.1</u>	Completed	None.
Total	<u>251.1</u>	<u>163.8</u>	<u>129.6</u>		

a/Storage facilities certified ready to receive oil and all operational start-up tests have been successfully completed.

Table 5

Status of Phase II SPR Storage Capacity

As of April 1, 1981 (note a)

(Millions of Barrels)

<u>SPR site</u>	<u>Total planned storage capacity</u>	<u>Volume of oil injected (note b)</u>	
		<u>Planned</u>	<u>Actual</u>
Bryan Mound, TX	120	.1	.04
West Hackberry, LA	160	(c)	
Bayou Choctaw, LA	<u>10</u>	<u>(d)</u>	<u>---</u>
Total	<u>290</u>	<u>.1</u>	<u>.04</u>

a/Source: DOE December 1980 baseline leaching schedule and April 1, 1981, monthly report of well leaching at Bryan Mound.

b/DOE is injecting oil into new caverns as capacity becomes available. DOE plans to create capacity by leaching underground salt caverns--a process involving injecting water into a salt formation, which dissolves salt, and removing the salt-saturated water, or brine. However, during leaching, only part of each new cavern can be used to store oil.

c/Leaching to begin during May 1981.

d/Drilling of wells which will be used for leaching started March 1981, leaching to begin November 1981.

ENCLOSURE I

ENCLOSURE I

Table 6
Status of Funding for the SPR
(Billion \$)

Funds available as of April 24, 1981

--Prior years' funds	\$2.093
--Fiscal year 1981 appropriations	1.383
--Entitlements (earned on fiscal year 1981 deliveries prior to decontrol on January 28, 1981)	<u>.542</u>
Total funds available for fiscal year 1981 oil purchases	a/ \$4.018

Contracts as of April 24, 1981

--Competitive exchange (36.6 million barrels)	\$1.442
--Open continuous solicitation (38.6 million barrels)	<u>1.474</u>
Total value of contracts as of April 24, 1981	<u>2.916</u>

Funds remaining for oil purchases b/ \$1.102

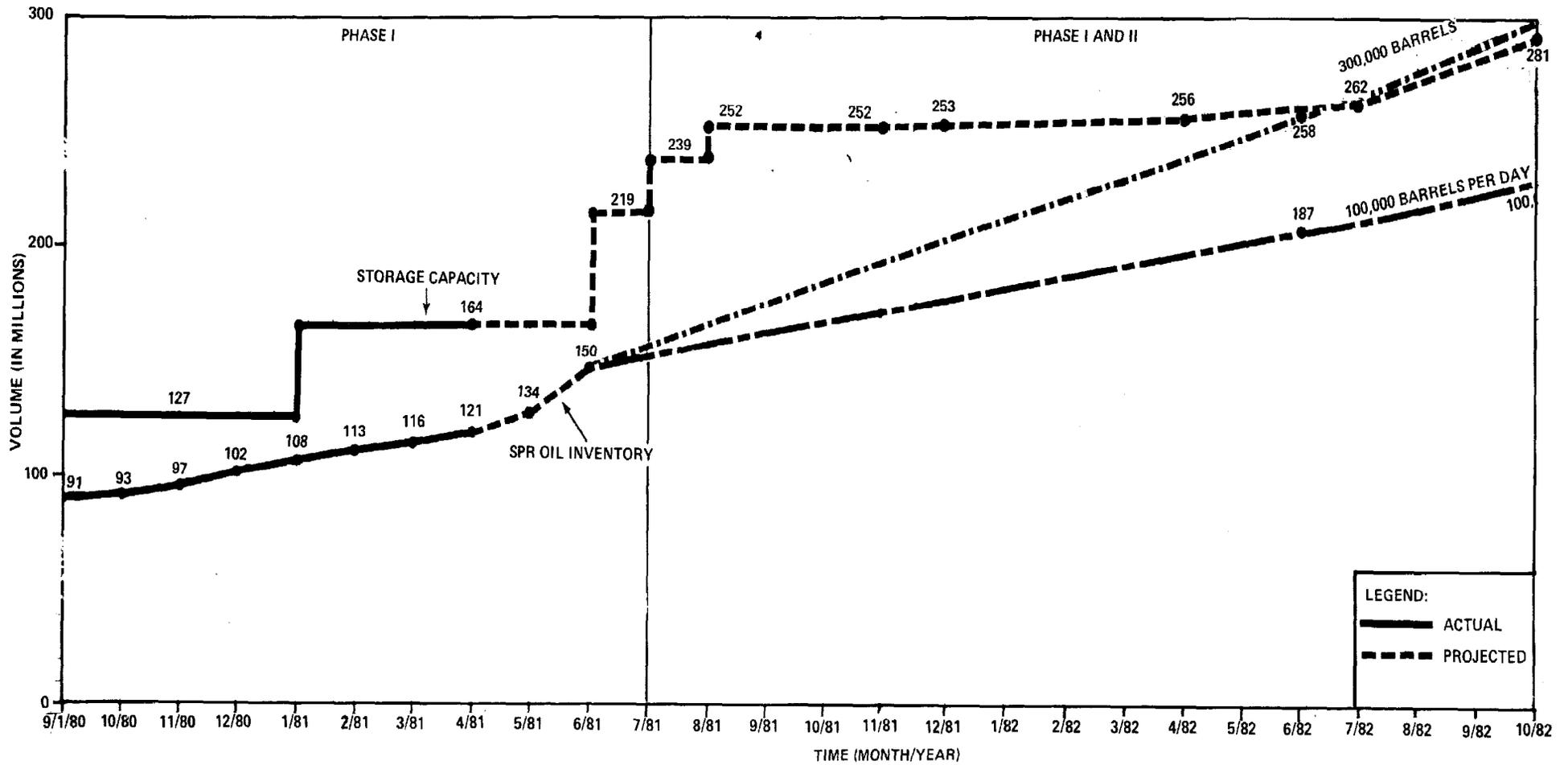
a/As of April 24, 1981, DOE had transferred all funds available to DFSC for SPR oil acquisitions.

b/DOE has requested \$1.3 billion supplemental appropriation for fiscal year 1981. If the supplemental is approved by Congress, DOE will have a total of \$2.4 billion available for fiscal year 1981 purchases.

ENCLOSURE I

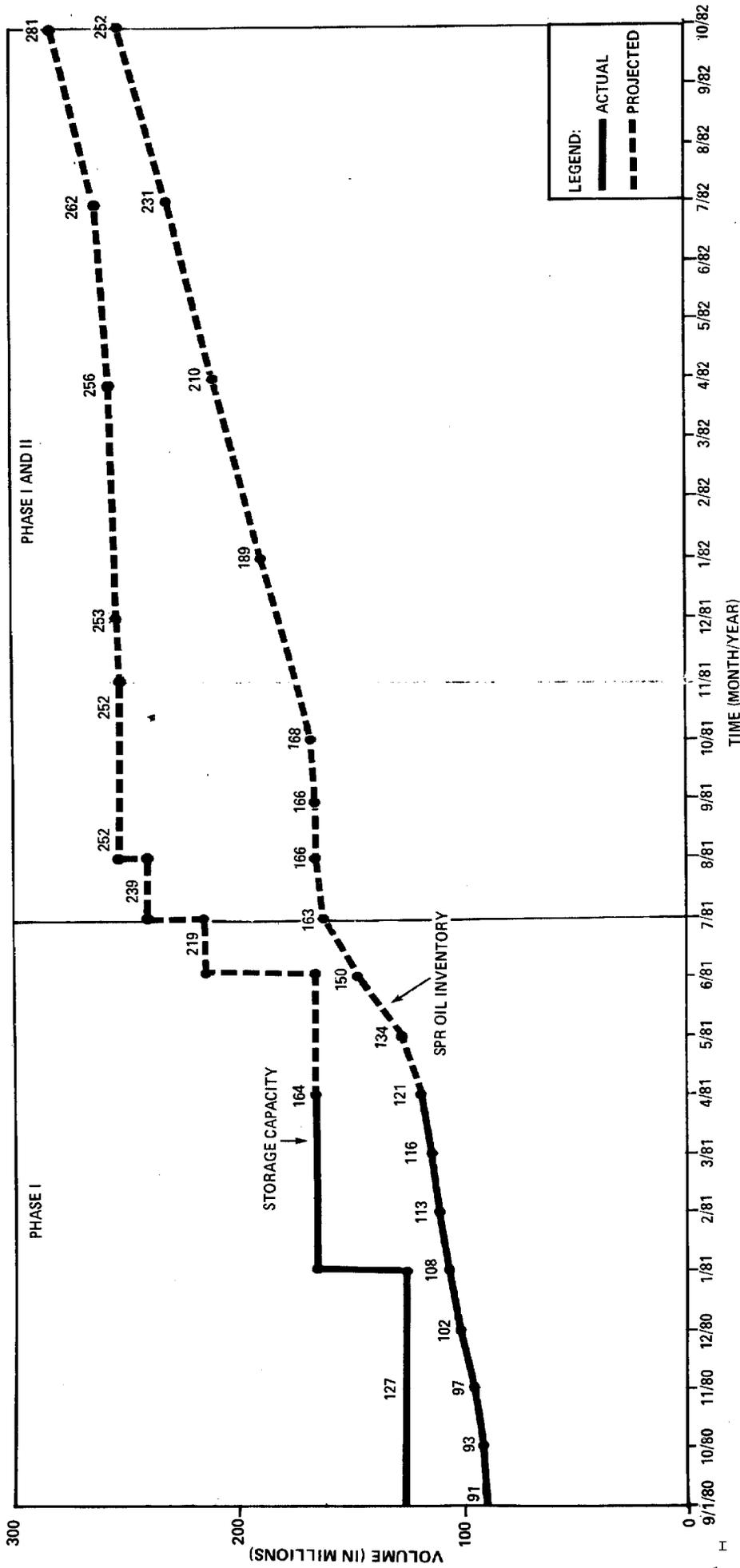
ENCLOSURE I

FIGURE 2
 ALTERNATIVE FILL RATES AND PROJECTED
 UTILIZATION FOR SPR STORAGE CAPACITY (Note a)



a/ GAO's projections of SPR capability assumes that DOE meets its schedules for bringing Phase I facilities on line and for creating Phase II capacity.

FIGURE 1
AVAILABILITY AND PROJECTED UTILIZATION
OF SPR STORAGE CAPACITY (Note a)



a/ GAO's projections of SPR capability assumes that DOE meets its schedules for bringing Phase I facilities on line and for creating Phase II capacity. Our projections of SPR oil inventory are based on DOE's proposed delivery schedules for existing contracts and DOE's proposed 230,000 barrels per day Fiscal Year 1982 Fill Rate.

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United States Senate

COMMITTEE ON
 ENERGY AND NATURAL RESOURCES

WASHINGTON, D.C. 20510

July 23, 1980

DANIEL A. DREYFUS, STAFF DIRECTOR
 G. MICHAEL HARVEY, CHIEF COUNSEL
 STEVEN G. HICKOK, STAFF DIRECTOR FOR THE MINORITY

Honorable Elmer B. Staats
 Comptroller General of the United States
 GENERAL ACCOUNTING OFFICE
 441 G Street, N.W.
 Washington, D. C. 20548

Dear Mr. Staats:

On June 30, 1980 the President signed the Energy Security Act (Public Law 96-294). Title VIII of this Act is intended to provide for a resumption of purchases by the United States government of crude oil for the Strategic Petroleum Reserve authorized in 1975 by the Energy Policy and Conservation Act. Purchases of oil for this purpose have been suspended for well over a year, despite the fact that the present level of the SPR is clearly inadequate insurance against any contemplated interruption in petroleum imports.

The Congress attaches a high priority to the timely implementation of the provisions of title VIII. Both the language of the Act and the accompanying joint statement of managers are very emphatic on this matter. Accordingly, we are asking that you assist Congress in monitoring implementation of this title by the Executive Branch.

In particular we request that the General Accounting Office report by letter on a monthly basis to the Senate Committee on Energy and Natural Resources and the House Committee on Interstate and Foreign Commerce describing the activities taken by the Executive Branch under the provisions of title VIII of the Energy Security Act. This report should include GAO's evaluation of these activities in relation to the clear intent of Congress, expressed in the Act, to resume as soon as possible the filling of the SPR. These monthly reports should continue through October, 1981. We are further requesting that GAO provide Congress by January 1, 1982 with a comprehensive report on activities of the Executive Branch under title VIII for the period July, 1980 through October, 1981.

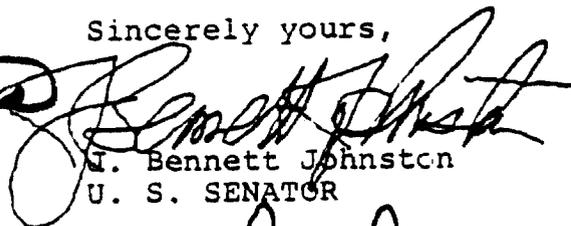
Honorable Elmer B. Staats
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Please let us know if the Senate Committee on Energy and Natural Resources or the House Committee on Interstate and Foreign Commerce can be of assistance in carrying out this request.

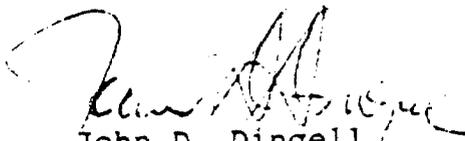
Sincerely yours,



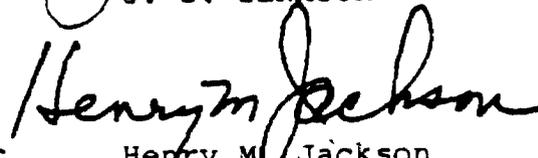
Harley O. Staggers
MEMBER OF CONGRESS



U. Bennett Johnston
U. S. SENATOR



John D. Dingell
MEMBER OF CONGRESS



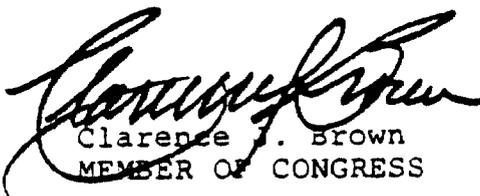
Henry M. Jackson
U. S. SENATOR



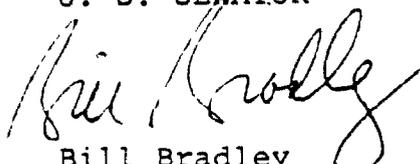
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Wendell H. Ford
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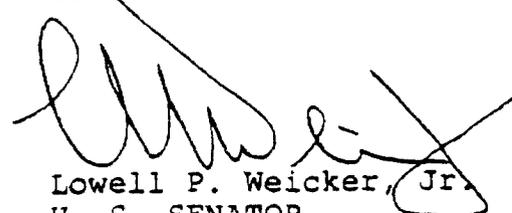
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