Strategic Petroleum Reserve Quarterly Report

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Assistant Secretary for Fossil Energy
Office of Strategic Petroleum Reserve
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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
I. STORAGE FACILITIES	2
Oil Fill Capabilities	3
Drawdown/Distribution Capabilities	4
Expansion Planning	4
II. OIL ACQUISITION AND FILL	5
III. BUDGET AND COST	6
Funds Available For Obligation	6
Oil Acquisition and Transportation(SPR Petroleum Account)	6
Financial Transactions, Fourth Quarter of Fiscal Year 1993	6
Planned Use of SPR Petroleum Account Funds	6
Storage Facilities Development and Operations and Management (Strategic Petroleum Reserve Account)	6
Financial Transactions, Fourth Quarter of Fiscal Year 1993	7
IV. SPECIAL TOPICS	8
Tiger Team Assessment	8
Security	8
Impacts on Drawdown Rate Due to Gas and Heat Build-up	8
Internal Training Exercise	9

LIST OF TABLES

	Page
TABLE I-1	
Strategic Petroleum Reserve Storage Capacity	3
TABLE II-1	
Strategic Petroleum Reserve Oil Inventory and Delivery Statistics	5

STRATEGIC PETROLEUM RESERVE QUARTERLY REPORT

EXECUTIVE SUMMARY

The Strategic Petroleum Reserve serves as one of our most important investments in reducing the Nation's vulnerability to oil supply disruptions. Its existence provides an effective response mechanism should a disruption occur and a formidable deterrent to the use of oil as a political instrument.

The Strategic Petroleum Reserve was created pursuant to the Energy Policy and Conservation Act of December 22, 1975, (Public Law 94-163), as amended to reduce the impact of disruptions in supplies of petroleum products and to carry out obligations of the United States under the Agreement on an International Energy Program. Section 165(a) of the Act requires the submission of Annual Reports and section 165 (b)(1) requires the submission of Quarterly Reports. This Quarterly Report highlights activities undertaken during the third quarter of calendar year 1993, including:

- ▶ inventory of petroleum products stored in the Reserve, under contract and in transit at the end of the calendar quarter;
- ▶ fill rate for the quarter and projected fill rate for the next calendar quarter;
- ▶ average price of the petroleum products acquired during the calendar quarter;
- ▶ current and projected storage capacity and plans to accelerate the acquisition or construction of such capacity;

- ▶ analysis of existing or anticipated problems with the acquisition and storage of petroleum products and future expansion of storage capacity;
- ▶ funds obligated by the Secretary from the SPR Petroleum Account and the Strategic Petroleum Reserve Account during the prior calendar quarter and in total; and
- ▶ major environmental actions completed, in progress, or anticipated.

As of September 30, 1993, the Reserve had a total inventory of 586 million barrels of crude oil. Samples of the oil revealed two problems that, although readily correctable, have reduced the availability of some of the oil inventory for drawdown in the near-term. These problems are:

- (1) A higher-than-normal gas content in some of the crude oil, apparently from years of intrusion of methane from the surrounding salt formation; and
- (2) Elevated temperatures of some of the crude oil, due to geothermal heating, that has increased the vapor pressure of the oil.

Investigations are proceeding to determine the extent to which gas intrusion and geothermal heating are impacting the availability of oil for drawdown. Preliminary designs have been developed for systems to mitigate both problems.

I. STORAGE FACILITIES

The Department of Energy has acquired and developed six storage facilities on the Gulf Coasts of Texas and Louisiana for the underground storage of crude oil in salt domes. Five sites, Bryan Mound and Big Hill in Texas, and West Hackberry, Bayou Choctaw, and Weeks Island in Louisiana, have been developed to store 750 million barrels of oil. Due to the high cost of operations, an additional storage site, Sulphur Mines in Louisiana, was decommissioned in 1992 and sold on May 10, 1993. The Department also constructed and operates a marine and pipeline distribution terminal on the Mississippi River in St. James, Louisiana. The following is a summary of the current status of the facilities, their respective oil fill and drawdown/distribution capabilities, and expansion planning activities.

BRYAN MOUND, TEXAS

The Bryan Mound Storage facility, near Freeport, Texas, is available for fill and/or drawdown operations. The site has a storage capacity of 226 million barrels and an inventory of 217 million barrels.

In May 1993, the Department approved an Environmental Assessment and issued a "Finding of No Significant Impact" for the replacement of the deteriorated brine pipeline at the Bryan Mound facility in Brazoria County, Texas. The pipeline construction contract was awarded to Maitland Bros. on September 15, 1993, and installation of the pipeline is scheduled for completion in August 1994. The existing condition of the brine pipeline does not impact drawdown capability.

BIG HILL, TEXAS

The Big Hill Storage facility near Winnie, Texas, is only available for fill operations at this time. The site has a storage capacity of 160 million barrels and an inventory of 37 million barrels, including 25 million barrels transferred from the Sulphur Mines Storage facility during 1991 and 1992.

WEST HACKBERRY, LOUISIANA

The West Hackberry Storage facility in Cameron Parish, Louisiana, is available for fill and drawdown operations. The site has a storage capacity of 219 million barrels and an inventory of 205 million barrels.

The brine disposal pipeline deteriorated and was taken out of service in 1991; interim brine disposal is being accomplished using existing brine disposal wells. The maximum brine disposal capability through these wells is approximately 55,000 barrels per day. Additional testing and brine well recompletions to further increase capability are planned for fiscal year 1994.

BAYOU CHOCTAW, LOUISIANA

The Bayou Choctaw Storage facility in Iberville Parish, Louisiana, is available for fill and drawdown operations. The site has a storage capacity of 72 million barrels and an inventory of 52 million barrels.

WEEKS ISLAND, LOUISIANA

The Weeks Island Storage facility in Iberia Parish, Louisiana, is essentially filled to capacity (72 million barrels) and is available for drawdown.

The Department is currently upgrading the service shaft bulkhead separating the oil storage area from the mine manways. Progress is on schedule, and the work will be completed later this year.

ST. JAMES TERMINAL, LOUISIANA

The St. James Terminal, located 45 miles southeast of Baton Rouge on the Mississippi River, services the storage facilities at Bayou Choctaw and Weeks Island and is available for both fill and drawdown operations.

OIL FILL CAPABILITIES

As of September 30, 1993, the Reserve had a total storage capacity of 750 million barrels and crude oil inventory of 586 million barrels. The oil fill capabilities for all the storage facilities are shown in Table I-1.

TABLE I-1
Strategic Petroleum Reserve Storage Capacity
(Figures in Millions)*

Storage Facility	Storage Capacity		Current Inventory		Capacity Available for Fill	
	(Barrels)	(Cubic Meters)	(Barrels)	(Cubic Meters)	(Barrels)	(Cubic Meters)
Bryan Mound	226	35.9	217	34.4	9	1.4
Big Hill	160	25.4	37	5.9	123	19.6
West Hackberry	219	34.8	205	32.6	14	2.2
Bayou Choctaw	72	11.4	52	8.2	20	3.1
Weeks Island	73	11.6	72	11.4	1	0.2
Tanks/Pipelines	--	--	3	--	--	--
Total	750	119.1	586	92.5	167	26.5

*Volumes are reported both in barrels and in cubic meters in conformance with the Metric Conversion Act of 1975, the Omnibus Trade and Competitiveness Act of 1988, and the Department's Metric Transition Plan.

DRAWDOWN/DISTRIBUTION CAPABILITIES

The Strategic Petroleum Reserve's current drawdown capability is 3.5 million barrels per day and its distribution capability is 4.1 million barrels per day. At present, the initial drawdown rate is limited to 3.5 million barrels per day because of the gas-in-oil problems with the inventory at the Big Hill site.

The Strategic Petroleum Reserve increased its physical distribution capability from 3.9 to 4.1 million barrels per day in May 1993, with the completion of an interconnection of the Big Hill pipeline to the Texaco Pipeline System from Port Arthur to Houston, Texas. This interconnection enables the crude oil stored at Big Hill to be delivered to refiners in Houston and in the midwest, or to the Oil Tanking Marine Terminal in Houston for lifting by tankers. The Strategic Petroleum Reserve will increase its physical distribution capability from 4.1 to 4.3 million barrels per day in October 1993 when Unocal completes final operational testing of its new marine outloading capability in Nederland, Texas. No further enhancements to increase distribution capabilities beyond 4.3 million barrels per day are planned at this time.

EXPANSION PLANNING

The Energy Policy and Conservation Act Amendments of 1990 (Public Law 101-383) required the Department to amend the Strategic Petroleum Reserve Plan by September 15, 1992, to prescribe plans for the expansion of the Reserve to one billion barrels. In May 1991, the Department announced its intent to prepare an Environmental Impact Statement to address the

environmental effects of expanding the capacity of the Reserve. A Draft Environmental Impact Statement was issued in October 1992 for five sites: Big Hill and Stratton Ridge in Texas, Weeks Island and Cote Blanche in Louisiana, and Richton in Mississippi.

In January 1993, the Department received comments on the Draft Environmental Impact Statement requesting consideration of an alternative means of brine disposal that was not covered in the Draft Environmental Impact Statement. To assure that all reasonable alternatives had been considered, the Department issued a Supplement to the Draft Environmental Impact Statement on June 4, 1993, for Richton, Mississippi, and Cote Blanche, Louisiana. The public comment period for the Supplement closed on July 26, 1993.

A Final Environmental Impact Statement for the candidate expansion sites, the Record of Decision, and the Plan Amendment is expected to be issued in the spring of 1994.

II. OIL ACQUISITION AND FILL

During the third quarter of calendar year 1993, the Strategic Petroleum Reserve's inventory was increased by approximately 2.9 million barrels of sweet crude oil. During fiscal year 1993, 14.2 million barrels were added to the Reserve at an average daily fill rate of 39,000 barrels.

During this quarter, 1.9 million barrels were acquired through continued deliveries of Stevens Zone crude oil from the Naval Petroleum Reserve Number 1 in California (Elk Hills). These deliveries began on June 1, 1992, and have been shipped at a rate of 20,000 barrels per day via the commercial pipeline system to Sun Terminal, Nederland, Texas, for storage at the Big Hill site. As a result of favorable commercial bid prices for Stevens Zone crude oil received on September 3, 1993, the Department has decided to suspend deliveries of Elk Hills crude oil to the Reserve for the period of October 1, 1993, through March 31, 1994.

As of September 30, 1993, a total of 9,741,062 barrels had been injected into the pipeline system and 8,029,826 barrels had been received at Sun Terminal. The 1,711,236 barrels remaining in transit will be received during the final calendar quarter of 1993. In addition to crude oil acquired from Naval Petroleum Reserve Number 1, 1 million barrels were purchased on the open market by the Defense Fuel Supply Center, the Strategic Petroleum Reserve's purchasing agent. This crude oil, Palanca from Angola, was delivered to the Reserve in early September under a contract awarded to Coastal States Trading, Inc.

The weighted average price for the sweet crude oil acquired for the Reserve during this period was \$18.10 per barrel, excluding Superfund taxes and costs for administration and terminalling. As of September 30, 1993, the total inventory was 585,658,374 barrels. Table II-I summarizes the Reserve's crude oil inventory and delivery statistics.

TABLE II-1
Strategic Petroleum Reserve Oil Inventory and Delivery Statistics
(As of September 30, 1993)

	Barrels	Cubic Meters
Total Strategic Petroleum Reserve Inventory	585,658,374	93,102,112
Amount of Oil in Transit*	1,711,236	272,035
Fill Rate (per day) for reported Calendar Quarter	31,576	5,020
Fill Rate (per day) for Fiscal Year 1993	38,925	6,188
Projected Fill Rate (per day) for the next Calendar Quarter*	18,600	2,957

* Naval Petroleum Reserve crude oil.

III. BUDGET AND COST

This section provides the financial information required by section 165(b)(1) of the Energy Policy and Conservation Act, as amended.

FUNDS AVAILABLE FOR OBLIGATION

The Department of the Interior and Related Agencies Appropriations Act, 1993 (Public Law 102-381) provided \$176.2 million for operations and management of the Reserve. The \$176.2 million for operations and management was financed in part by the requested transfer from the SPR Petroleum Account of \$125.6 million derived from funds deposited from the 1991 Desert Storm drawdown and sale. The Appropriations Act also included an outlay cap of \$137 million on funds in the Petroleum Account. Total funds available for obligation in the SPR Petroleum Account in fiscal year 1993, after the transfer of \$125.6 million, are \$532.5 million.

Also for fiscal year 1993, the Congress provided \$125.6 million through the Department of Defense Appropriations Act, 1993 (Public Law 102-396), for the Department of Energy to acquire crude oil for the Department of Defense for storage in the Strategic Petroleum Reserve. The Appropriation Act also allows the Department of Energy to transfer up to \$700,000 to the Strategic Petroleum Reserve Account to pay for costs of operations and maintenance associated with the extra oil acquisition and storage.

OIL ACQUISITION AND TRANSPORTATION (SPR PETROLEUM ACCOUNT)

This activity includes financing for: (1) the Strategic Petroleum Reserve crude oil procurements; (2) associated transportation

costs for pipeline and tanker shipments and terminalling; (3) U.S. customs duties and Superfund taxes; and (4) other miscellaneous costs, such as Defense Fuel Supply Center administration costs associated with acquiring and transporting the oil. During a draw-down and sale, this activity funds the Federal cost of drawing down Strategic Petroleum Reserve oil from storage and transporting it to the point where purchasers will take title.

FINANCIAL TRANSACTIONS, FOURTH QUARTER OF FISCAL YEAR 1993

During the fourth quarter of fiscal year 1993, \$44.1 million was obligated from the SPR Petroleum Account. Net disbursements (outlays) from the Account during the same period amounted to approximately \$63.5 million.

PLANNED USE OF SPR PETROLEUM ACCOUNT FUNDS

Although the SPR Petroleum Account contains \$532.5 million of obligational authority, the Department is controlling obligations in order to limit outlays to the legislated limit of \$262.6 million. Unobligated funds at the end of the fiscal year will support oil acquisition in fiscal year 1994 and beyond.

STORAGE FACILITIES DEVELOPMENT AND OPERATIONS AND MANAGEMENT (STRATEGIC PETROLEUM RESERVE ACCOUNT)

Storage Facilities Development and Operations funding provides for the Strategic Petroleum Reserve facilities program, including the construction, operation, and maintenance of the Strategic Petroleum Reserve sites. Management funding provides analyses pertinent to major issues concerning the development and use of the

Strategic Petroleum Reserve and for the salaries and expenses necessary to plan and manage the Strategic Petroleum Reserve.

**FINANCIAL TRANSACTIONS, FOURTH
QUARTER OF FISCAL YEAR 1993**

Obligations of \$230.2 million are available for Storage Facilities Development, Operations and Management in the fiscal year 1993, and \$72.3 million was obligated in the fourth quarter. Cumulative net obligations for fiscal year 1993 were approximately \$191.3 million at the end of the fourth quarter.

IV. SPECIAL TOPICS

TIGER TEAM ASSESSMENT

The Strategic Petroleum Reserve has completed 72 of the 250 corrective actions included in the Corrective Action Plan prepared after the Tiger Team Environmental Safety and Health Assessment in 1992. Of the 218 occupational, safety, and health noncompliance findings, all but one have been completed. The remaining item involves the installation of a seven mile potable water pipeline from the City of Winnie, Texas, to the Big Hill site; the pipeline is under contract and scheduled for completion in mid-1994.

SECURITY

Due to changes in the global political climate, a vulnerability assessment of facilities was conducted during 1992. As a result, several changes to the security program are being implemented that will result in cost savings from reduced manpower, maintenance, and upgrade requirements. A new security plan which reflects the revised security program was completed in September 1993 and is under review.

IMPACTS ON DRAWDOWN RATE DUE TO GAS AND HEAT BUILD-UP

In 1992, investigation began on two natural phenomena that potentially impact the drawdown and distribution of crude oil in the Reserve. One is the intrusion of methane gas into the crude oil from the domal salt, and the other is geothermal heating that has raised the temperature of the oil significantly in some of the caverns. These phenomena produced an increase in the true vapor pressure of the crude oil that could result in emissions that exceed environmental and safe operating limits.

Gas in the Oil: Tests have shown that methane and nitrogen are present in relatively small quantities in the crude oil stored at all sites, (except Weeks Island Mine), probably as a result of intrusion from the salt formation. These gases have produced an increase in the true vapor pressure of the crude oil to a point where emissions could exceed environmental limits and safe operating levels allowed by terminals, pipelines, tankers, and refiners. Operational tests at Bryan Mound have demonstrated that maximum drawdown rates can be achieved. During these tests, however, emissions exceeded permitted levels and, in future movements, could pose a safety hazard in addition to regulatory noncompliance. Multi-level sampling and field analysis of the crude oil inventory in selected caverns has been initiated. Although preliminary results of these tests show that cavern oil has a lower vapor pressure than indicated by earlier laboratory analyses, excessive gas is present and must be separated to minimize emissions and mitigate a safety hazard.

Increase in Oil Temperature: Heat flux from the salt at the depth at which caverns are developed is causing the temperature of the oil to rise at an average rate of 1 degree Fahrenheit per year. Temperature of the oil will continue to rise until it is in equilibrium with the salt formation. These elevated temperatures produce an increase in the vapor pressure of the crude oil, which could also result in emissions exceeding environmental and safe operating limits during a drawdown. This situation poses no safety hazard for stored oil, nor does it reduce oil quality.

A multi-disciplinary working group is continuing to address the extent to which crude oil in the Strategic Petroleum Reserve needs to be degassed and cooled and is

preparing preliminary designs for accomplishing these processes. Analyses indicate that: (1) separation of the gas from the oil can be accomplished using conventional, portable, gas/oil separators; and (2) relatively simple heat exchangers can be installed on the oil line to allow water used for drawdown to reduce oil temperatures.

The Department has briefed congressional committee staff on these matters and has initiated field testing of methods to mitigate the excess gas problem. The current estimated cost to resolve the excess gas problem is nearly \$35 million. The schedule for the installation of degassing facilities and the start of degassing operations is approximately one year. Total degasification of all the affected oil is anticipated to take from three to four years. Environmental analysis and system design have also been initiated. The current estimated cost to resolve the oil temperature problem is \$25 million.

INTERNAL TRAINING EXERCISE

During the period August 2 through September 17, 1993, the Strategic Petroleum Reserve conducted a drawdown training exercise named SPRITE-VII. This exercise involved the entire organization, including contractors, in the performance of the various functions, excluding the actual movement of oil, associated with conducting a drawdown and sale of Strategic Petroleum Reserve crude oil in the event of a severe energy emergency.

SPRITE-VII was successful in meeting its training objectives and enhancing the Reserve's readiness to meet a drawdown situation.

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