



# Strategic Petroleum Reserve Plan, 3#5

Amendment No. 1, 2#5

Acceleration of the Development Schedule, 3#5

Energy Action No. 12

D. 930

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## INTRODUCTION

The Energy Policy and Conservation Act (EPCA), signed into law on December 22, 1975, authorized the creation of a Strategic Petroleum Reserve (SPR). The objective of the SPR is to provide for the storage of substantial quantities of petroleum in order to diminish U.S. vulnerability to the effects of a severe petroleum supply interruption.

The purpose of this Amendment to the Strategic Petroleum Reserve Plan, which was transmitted to Congress as Energy Action No. 10 on February 16, 1977, and became effective April 18, 1977, is to present an accelerated schedule for the Reserve's development. This Amendment is to accelerate the development schedule to have 500 million barrels (MMB) of oil in storage by the end of 1980.

This change amends Chapter VIII of the Strategic Petroleum Reserve Plan as presented under Energy Action No. 10.

This initiative is an integral part of the President's National Energy Plan and represents a major effort to provide the U.S. with protection against the consequences of a severe petroleum supply interruption as soon as practicable. This Amendment describes the proposed acceleration of the SPR and discusses briefly the implementation activities necessary to achieve the objective. The benefits and costs of the proposed action are estimated. The economic and environmental impacts of the modified program are also assessed within this report.

This Energy Action to amend the SPR Plan is transmitted pursuant to Sections 154, 159, and 551 of the EPCA of 1975 (42 USC 6234, 6239, and 6421). Section 154(e)(6) requires that the SPR Plan contain a justification for any changes, with respect to volumes or dates, proposed in the storage schedule in Section 154(c). Section 159(d) authorizes amendments to the SPR Plan, to be transmitted with explanations of the need therefor, and to the maximum extent practicable, information similar to that which Section 154(e) required be contained in the Plan previously transmitted under Section 159(e).

The explanation of the need for the Amendment as required by Section 159(d) is set forth in Chapter I. The remaining chapters and the Appendix contain, to the maximum extent practicable, the assessments, estimates, evaluations, and other information required by Section 159(d).

SPR Plan amendments become effective and may be implemented if neither House of Congress disapproves (or both Houses approve) such amendments in accordance with the procedures specified in Section 551. Consequently, in accordance with Section 551, if no action is taken by Congress on this Amendment within 15 days of continuous session, this Amendment to the SPR Plan shall become effective, the volumes and dates specified in Section 154(c) of the EPCA shall stand revised as provided in this Amendment, and the amended SPR Plan may be implemented as provided in Section 159(f).

The Amendment does not deal with the Regional Petroleum Reserve or storage in noncontiguous areas. Previous analysis indicated that centralized storage of crude oil would provide adequate protection for all regions of the country. Some question continues to exist, however, regarding the adequacy of only central storage of crude oil under certain severe interruption possibilities. The Federal Energy Administration (FEA), therefore, is conducting a complete reexamination of the issues of whether there is a need to store petroleum products in regions heavily dependent on petroleum product imports or in noncontiguous areas of the country. FEA has established a working group to help conduct the reexamination of the regional reserve issue, which includes participation by representatives of the State Governments of all the New England States as well as New York and New Jersey. A joint working group also has been established with representatives of the State of Hawaii to examine the need for crude or refined product storage in the State. To the extent possible, these working groups also will obtain input from non-Government representatives in the States who have expertise on this issue. The working groups are examining the following subjects:

- o The petroleum supply and demand projections for the States;
- o The ability of a centralized Reserve of crude oil in the Gulf Coast to meet the needs of the States;
- o Availability of U.S. refinery capacity to replace lost product imports during an interruption;
- o The product allocation and price control systems needed to assure an equitable distribution of petroleum supplies during an interruption;

- o Availability of products from non-embargoing countries during a supply disruption, and the operation of petroleum markets during an emergency;
- o Availability of tankers to transport products;
- o Petroleum inventory levels maintained by utilities and other major users in the States, and inventories in other areas that could be relied on to meet the needs of the States;
- o The additional costs and benefits associated with any regional storage that may be needed (in addition to central storage) to provide substantial protection from severe petroleum supply interruptions; and how the costs should be distributed;
- o If any regional product reserve is needed, the type of product that would be stored considering the particular problems with long-term storage of refined products; and
- o If any regional reserve is needed, the potential storage locations and types of storage facilities that might be required, including estimates of the costs and environmental impacts of such storage.

A report to Congress will be submitted regarding the conclusions of this reexamination no later than December 15, 1977.

The President's National Energy Plan proposed that the Strategic Petroleum Reserve be expanded to 1 billion barrels, to provide relative invulnerability to another interruption of foreign oil supply. Another Amendment to the SPR Plan to reflect this decision will be submitted to the Congress for its review.

## CHAPTER I

### ACCELERATION OF THE SPR DEVELOPMENT SCHEDULE

#### THE AMENDMENT

The development schedule dates set out on page 167 of the SPR Plan are amended to establish targets of attaining 250 MMB of oil in storage by the end of 1978 and 500 MMB of oil in storage by the end of 1980.

The changes in the development schedule are shown below.

#### SPR Development Schedule

<u>Target Dates</u>	<u>EPCA Section 154(c) (MMB)</u>	<u>SPR Plan Submitted as Energy Action No. 10 (MMB)</u>	<u>Amended Plan Energy Action No. 12 (MMB)</u>
June 22, 1977	50	0	0
December 22, 1978	150	150	250
December 22, 1980	325	325	500
December 22, 1982	500	500	-

#### THE NEED FOR THE AMENDMENT

The amended schedule provides for attaining 500 MMB 2 years earlier than proposed in Energy Action No. 10. This

represents an increase of 175 MMB in storage by the end of 1980 compared with the target originally presented in the SPR Plan.

The recent increases in U.S. oil imports to a high of nearly 10 MMB per day in February 1977 clearly show the current U.S. dependence on petroleum imports. The U.S. is more dependent on imported oil today than it was prior to the 1973-74 embargo, and there is no basis for confidence that another interruption will not occur. The unexpectedly severe weather this past winter demonstrated again our dependence on petroleum supplies and our vulnerability to sudden increases in demand or reductions in supply. A major interruption of oil imports during a severe winter, such as we recently experienced, could have a devastating impact unless we are prepared with a large Reserve. In the near term, we have no better means of protecting ourselves against a severe petroleum supply interruption than by developing a Strategic Petroleum Reserve. Other measures will cause substantial economic disruption and hardship.

It is essential that this country attain the protection afforded by the SPR as quickly as is physically feasible, without creating unacceptable environmental problems, incurring extraordinary costs, or seriously disrupting the petroleum market by the level of SPR oil purchases. Delaying the program will only increase the total budget costs, while foregoing the protection of a larger Reserve.

The benefits of accelerating the SPR development are clear based on the experience with the 1973-74 embargo, and the increasing level of dependence on imported oil. A severe interruption of imported oil without the protection of the SPR could result in a grave impact on the American economy, which in turn may seriously reduce U.S. foreign policy options in responding to a politically motivated embargo. In addition, our national security could be threatened by actions by hostile forces to cut off shipments of foreign oil to the U.S. and its Allies in time of war. Secretary of Defense Brown recently stated in testimony before the Congress that "in the event of some future confrontation, the Soviet Union might be able to restrict access of the Western world to its essential oil supplies to a degree of severity and duration greater than any embargo by oil producers."

The economic benefits of accelerating the Reserve have been estimated using an input-output model, as discussed in Appendix A of the SPR Plan. Based on that model, a 500 MMB Reserve in 1980 would have discounted net benefits ranging from about \$3 billion to over \$5 billion more than a 325 MMB Reserve, in terms of Gross National Product (GNP) loss averted in the event of a severe interruption. The net benefits of the larger Reserve increase with the severity of the interruption. It is estimated that the incremental 175 MMB in the Reserve under the accelerated schedule could avoid the loss of 80,000 to 130,000 jobs in the event of a severe interruption in 1980-81.

A larger Reserve in 1980 will enhance the foreign policy value of the Reserve by allowing additional time to respond to an interruption before it begins to have a serious impact on the U.S. economy. With 500 MMB rather than 325 MMB, there would be 60 to 90 more days of supply available from the Reserve under likely interruption scenarios. In addition to providing several more weeks for potential resolution of the problems leading to an embargo, the larger Reserve could increase the deterrent value of the SPR. The accelerated schedule also will provide increased national security protection against potential oil interruptions in time of war. These economic, foreign policy, and national security benefits will begin accruing in 1978 as the level of oil in storage begins to exceed the levels that would have been attained under the slower schedule.

It is now estimated that these important benefits can be obtained with little or no increase in program costs. As discussed in Chapter III, the Federal expenditures for storage sites and construction are expected to increase under the accelerated schedule, but this increase may be more than offset by lower Federal expenditures for oil due to earlier purchases at prices that are expected to be lower than prices in subsequent years. The accelerated schedule will increase the budget expenditures for the program in 1978 through 1980, compared with the slower schedule.

As discussed in Chapter IV, the requirements for oil under the accelerated schedule may result in some upward pressures on prices of low sulfur crude oils. This could result in an increase in the total economic costs of the program, but it is not possible to estimate the amount of any such cost increases at this time.

## FEASIBILITY OF ACCELERATION

When the SPR Plan was prepared last fall, it was FEA's best estimate then that it would not be possible to significantly accelerate the schedule, although it was believed that some acceleration would be possible, particularly in the latter part of the program. In making that judgment, FEA did not have the benefit of completed technical and environmental assessments on a variety of alternative storage site development and fill options that had the potential of permitting program acceleration without significantly increasing costs or environmental hazards. Also, FEA had not completed development of detailed operating plans for the type of oil to be stored at each candidate site, which affects the potential economic impact of the SPR oil procurement schedule.

In view of the clear need for the Reserve, and the high priority placed on this program by the new Administration, FEA began an intensive examination of development options that would permit acceleration of the SPR schedule, while avoiding serious economic or environmental impacts. The examination of options identified several possibilities which could increase the fill rate without a significant increase in costs or environmental hazards. For example:

- o The use of a large pipeline from a tanker port to some of the sites for fill, rather than barging oil to the sites, will permit a substantial increase in the fill rate, as well as reduced exposure to oil spill risks.
- o By using additional sites with existing storage capacity, fill can be accelerated while reducing the problem of disposing of brine from leaching new capacity or disposing of excavated materials.
- o Using alternate brine disposal systems, such as disposing of some of the brine at sea, providing some for industry use, and injecting some in disposal wells, is expected to permit a faster rate of fill without an increase in environmental hazards.

- o The careful selection of crude oil types for each candidate site will reduce the peak demand placed on sweet (low sulfur) crude oil which is in relatively short supply, thereby alleviating the market pressures of the oil purchases. The fill rate also can be increased by storing only one crude oil type at several of the sites during the peak fill period.

Although the detailed environmental impacts of some of the possible changes are still being assessed, it is expected that the changes will be environmentally acceptable and may actually reduce the potential environmental impact of the program.

Based on this examination, it was concluded that it would be feasible to accelerate the schedule to achieve 500 MMB of storage by the end of 1980 rather than the end of 1982. As part of the effort to reach the 500 MMB target by the end of 1980, it was decided to establish a target of 250 MMB in storage by the end of 1978. This would be 100 MMB more than the minimum goal for 1978 set forth in the EPCA.

Although it is not possible at this time to be certain that the target of 250 MMB by the end of 1978 can be met, FEA believes that there is a high probability of meeting this target if all reasonable efforts are begun now. A delay in obtaining adequate funding for this acceleration, however, will preclude meeting this target. A delay in funding also could jeopardize achievement of the goal of 500 MMB by the end of 1980.

Chapter II discusses in some detail the actions FEA expects to take to achieve this accelerated schedule.

## CHAPTER II

### IMPLEMENTATION OF THE ACCELERATED PROGRAM

#### SUMMARY

The accelerated development of the Reserve will be managed by the Office of Strategic Petroleum Reserve (SPRO) in the Federal Energy Administration. The SPRO organizational structure and the key SPRO development activities necessary to successfully achieve the program are described in the SPR Plan.

Acceleration will be achieved by expediting and compressing all activities associated with site development and the oil procurement and fill process. Existing capacity in solution-mined salt caverns and conventional mines will be utilized to the fullest extent possible for storing the oil. Use of existing underground storage will permit a faster rate of fill than could be obtained with the use of newly developed capacity; the rate of new capacity development will restrict the oil fill rate. Development of the Reserve after completing fill of existing capacity is expected to consist primarily of developing additional underground storage capacity at sites with existing capacity, or at one or two additional sites which are close to the other sites selected, in order to make maximum use of facilities and systems already developed.

#### FACILITY DEVELOPMENT

The site selection process for the initial storage sites needed to attain 250 MMB of oil in storage by the end of 1978 is now in its final stage. These initial sites will be utilized for storage of oil beginning in 1977 and will be the primary storage facilities for the 500 MMB.

Final Environmental Impact Statements have been completed for five of the Early Storage Reserve candidate sites described in the SPR Plan, and the following four

sites have been selected for the Program:

<u>ESR Site</u>	<u>Location (Parish/County &amp; State)</u>	<u>Type of Underground Storage</u>	<u>Estimated Available Capacity (MMB)</u>
Bayou Choctaw	Iberville, Louisiana	Leached Salt Caverns	74 <sup>a/</sup>
Bryan Mound	Brazoria, Texas	Leached Salt Caverns	63 <sup>b/</sup>
West Hackberry	Cameron, Louisiana	Leached Salt Caverns	61
Weeks Island	Iberia, Louisiana	Salt Mine	89
			287

a/ 94 MMB was originally identified for SPR storage; however, 20 MMB of this is currently being used for hydrocarbon storage and is not available for Government use.

b/ 58 MMB was originally identified as the existing capacity; however, 5 MMB additional capacity has been shown by recent sonar logs.

Bayou Choctaw, Bryan Mound, West Hackberry and Weeks Island have been chosen on the basis of their (1) technical feasibility and suitability for crude oil storage; (2) availability of existing storage capacity; (3) proximity to existing petroleum distribution systems; (4) environmental suitability; (5) security and safety; and (6) acquisition, development and operations costs. These sites have a combined storage capacity of approximately 287 MMB. Possession of the West Hackberry, Bayou Choctaw, and Bryan Mound sites has been obtained pursuant to condemnation actions. Negotiations for acquisition of the Weeks Island site are in progress.

A detailed description of the four sites, including the type and location of the facility, the proximity of the storage site to related facilities, the volume of petroleum to be stored and the ownership immediately prior to acquisition is contained in the Appendix to this Amendment.

Final assessment and evaluation of the remaining ESR candidate sites should be completed by July 1977. The same six evaluation criteria presented above will be applied to these sites during the site selection process. One or two of these sites may be selected to provide the capacity needed to receive oil during 1978 in order to achieve the 250 MMB target.

It is estimated that the four sites already selected plus the additional one or two sites expected to be selected to receive oil in 1978 will provide about 325 MMB of total capacity. It is expected that the balance of the total 500 MMB storage capacity will be developed from a combination of other existing underground storage capacity that has been identified, leaching additional capacity at some of the initial sites, and possibly leaching caverns at one or two of the 13 SPR candidate undeveloped salt domes identified in the SPR Plan. The assessment of the technical, environmental and programmatic feasibility of developing SPR storage capacity at these sites is now in progress. Selection of the additional sites required to reach the 500 MMB goal will be made in early 1978, at which time a detailed report will be submitted to Congress containing the information on each site selected, as required by Section 154(e) of the EPCA.

#### CURRENT STATUS OF DESIGN AND CONSTRUCTION EFFORT

FEA selected the Gulf Interstate Engineering Company in December 1976 to serve as executive engineer for the storage site development. The executive engineer has been responsible for preparing the overall conceptual design for the ESR candidate sites.

Gulf Interstate has proceeded with the preparation of construction drawings and specifications for interim fill systems at the three sites acquired for initial storage in 1977 (Bryan Mound, West Hackberry and Bayou

Choctaw). Interim fill designs and construction bid documents for these three sites have been completed. Preliminary design work for the remaining candidate sites is planned for completion by July 1977.

FEA has selected a joint venture consisting of the Ralph M. Parsons and Gilbane Companies as the construction management contractor. Parsons-Gilbane is responsible for assisting FEA in reviewing designs and contracts, construction planning, estimates, scheduling and cost control, and management planning during the design stage. During the construction stages, Parsons-Gilbane will assist in the procurement of long-lead time equipment items and in the construction activities, including quality and safety assurance and startup and testing services. Additionally, Parsons-Gilbane will assist FEA in the supervision of construction of off-site pipelines and any necessary dock and tank facilities for handling incoming crude oil from tankers and barges along the Gulf Coast.

FEA expects to contract soon for site development engineering work for the Bryan Mound, Bayou Choctaw and West Hackberry salt dome sites. The site development engineer will prepare detailed drawings and specifications based on the preliminary designs by Gulf Interstate for all construction activities to be performed by contractors obtained through competitive bidding.

Development work at all four sites selected is now beginning. Construction of a 30-inch pipeline across the Jones Creek and three adjacent levees has already been completed near the Bryan Mound site. The pipeline crossing of Jones Creek was completed prior to the beginning of the waterfowl nesting season in downstream wetlands. This action prevented the adverse effects of resuspending polluted sediments and of increasing turbidity while dredging during the nesting season.

The levee crossings were accomplished prior to the hurricane season in order to preserve the integrity of the City of Freeport's hurricane defense system.

Cavern testing and certification was started in early May 1977 at West Hackberry by FEA's executive engineer, Gulf Interstate. Certification at the other two leached

cavern salt dome sites, Bryan Mound and Bayou Choctaw, and at the Weeks Island salt mine is planned to begin no later than June 1977. When the individual caverns and the mine are certified as suitable for crude oil storage, they will be prepared to receive oil. Temporary pipelines will be used at West Hackberry and Bayou Choctaw to permit the start of oil delivery to these sites during July and August, respectively.

In April 1977, FEA signed contracts with two steel producers for 84 miles of pipe for the permanent pipeline links between the sites and major tanker ports and pipeline terminals. Armco Steel and Bethlehem Steel have begun manufacturing 36-inch and 42-inch pipe for delivery in mid-1977. Permanent pipeline construction for West Hackberry and Bayou Choctaw is scheduled to begin in late summer or early fall. Pipeline construction at Bryan Mound is scheduled to begin in early summer using 30-inch pipe acquired from existing inventories of this common pipe size.

#### OIL FILL SCHEDULE

The filling of the ESR sites is scheduled to begin in mid-1977 under the accelerated SPR development schedule. The West Hackberry site is expected to be ready to begin receiving crude oil in July 1977 at the rate of between 30,000 and 50,000 barrels per day, with fill scheduled to start at Bayou Choctaw in August at about 30,000 barrels per day. Both of these sites will be initially filled by temporary pipelines from barge docks near the sites.

In the first half of 1978, permanent pipeline facilities will be completed to connect both of these sites to tanker docks located in major Gulf Coast ports. At that time the fill rates for West Hackberry and Bayou Choctaw are scheduled to be increased to a maximum of 175,000 and 240,000 barrels per day, respectively, until fill of all available existing capacity at these sites has been accomplished.

If the permanent pipelines and related facilities are completed on schedule, and if there are no serious weather

or other delays in fill, the estimated existing capacity of 61 MMB at West Hackberry will be filled and approximately 70 MMB will be in storage at Bayou Choctaw by the end of 1978. It is now planned to fill the existing capacity at these two sites with intermediate gravity, high sulfur (sour) crude oil meeting the specifications for the Type I oil set forth in Appendix B of the SPR Plan. Type I oil must have a sulfur content no greater than 1.9 percent and an API gravity of 32-36°.

Fill at Bryan Mound is scheduled to begin in October 1977, and is planned at an average rate of 150,000 barrels per day. Unlike the other two ESR sites, the permanent crude oil pipelines from the site to existing tanker docks and tank farm will be in place when the first crude oil shipments arrive. Fill of Bryan Mound is scheduled to continue throughout the remainder of 1977 and all of 1978 until the estimated 63 MMB of existing capacity is filled by the end of 1978. It is now planned to fill the existing capacity at Bryan Mound with low sulfur (sweet) crude oil meeting the specifications of Types II, III, or IV set forth in Appendix B of the SPR Plan.

Fill of Weeks Island salt mine will begin in the latter half of 1978. Conversion of the existing mine is scheduled to begin while salt production in the mine is being phased out. Existing Weeks Island mining operations can be moved to a new location on the site. After conversion of the mine for SPR storage, oil fill will begin immediately at a rate of up to 240,000 barrels per day. The option to fill Weeks Island by pipeline from St. James, Louisiana, is currently being environmentally assessed and economically evaluated, with a final decision expected in the fall of 1977. Pipeline fill of the site appears at this time to be environmentally safer and to offer a higher fill rate than does the use of barges. It is now expected that Weeks Island will contain about 28 MMB of oil by the end of 1978 and that the existing capacity of approximately 90 MMB will be filled before the end of 1979. It is planned to fill the Weeks Island capacity with sour crude oil meeting the specifications for Type I oil.

These four sites are scheduled to contain about 220 MMB of oil by the end of 1978. An additional one or two sites

will be selected by mid-1977, which will have a development schedule that will provide the remaining capacity needed for a total of 250 MMB by the end of 1978.

Based on FEA's current estimates, it is expected that the amount of oil in storage by the end of 1978 will be determined by the status of development of oil fill systems and the efficiency of oil procurement and transportation efforts, rather than by a lack of adequate storage capacity. A 1-month slippage of the fill schedule at all sites could result in reducing the oil in storage to about 250 MMB by the end of 1978. Slippage of a month or two in the fill schedule will not jeopardize the 500 MMB goal, however. The sites will have a combined fill rate capacity totalling about 900,000 barrels per day, or 27 MMB per month, and a slippage of a month or two in 1978 could be recovered in early 1979.

In order to begin filling existing storage capacity in 1977, initial oil procurement is now underway. It also is necessary to begin planning now for the acquisition of the oil for 1978 and 1979. Procurement of the quantities of oil needed requires that the process begin about 6 months prior to delivery. In order to obtain oil for delivery in the last 3 months of 1978 and early 1979, the procurement must begin in Fiscal Year 1978. Appropriated funds should be available for obligation at the time of contract award, even though delivery and payment may occur months later.

It also is necessary to begin work now to establish all of the elements of the fill system to handle the capacity required to meet the accelerated fill goals, including tanker dock space and terminal facilities. Because of the long lead times involved, it is necessary to proceed now with the acceleration effort, including obtaining the appropriations for the oil purchases. Uncertainty regarding the availability of funds for the Program will force delays in making commitments to handle the fill and is likely to prevent achievement of the accelerated schedule. Major delays in fill in 1978 and early 1979 would jeopardize the 1980 goal of 500 MMB.

If the existing capacity at the sites can be filled at approximately the planned rate, there will be adequate flexibility to develop and fill the additional capacity needed to achieve 500 MMB by the end of 1980. It is planned

to begin development of the expansion capacity in the first part of 1978 and to start filling this capacity in early 1979. This will provide 2 years to leach and fill the increment of about 175 MMB of capacity if all of the expansion is obtained by leaching caverns in salt domes.

Based on this accelerated fill schedule, the rate of oil fill by year is estimated as follows:

<u>Calendar Year</u>	<u>Average Fill (MB/D)</u>
1977*	150
1978	620
1979	400
1980	295

\*July through December 1977.

#### STATUS OF OIL PROCUREMENT AND FILL PROCESS

FEA has entered into an agreement with the Department of Defense for the Defense Fuel Supply Center to assist the FEA in procuring petroleum for the Reserve, in accordance with requirements specified by FEA. The Military Sealift Command also will provide assistance in arranging tanker transportation for the oil.

The Defense Fuel Supply Center is now implementing the initial oil procurements. Expedited procurement procedures will be used to obtain the initial 2 million barrels, with delivery to begin in July 1977. It is expected that offers will be received to provide imported oil which is in transit, either on ship or in transshipment storage, for this initial 2 MMB.

A request for proposals was issued on May 5, 1977, for the second increment of oil; offers were requested on 8 MMB of sour crude oil to be delivered for West Hackberry and Bayou Choctaw sites during August through December. A third solicitation will soon be issued for sweet (low sulfur) crude oil to be delivered for the Bryan Mound site starting in October.

SPRO has established a permanent office at the Defense Fuel Supply Center offices to coordinate the oil procurement for the SPR.

In order to start fill operations at Bryan Mound, West Hackberry and Bayou Choctaw in mid-1977, FEA has recently issued six separate requests for proposals for barge and tanker terminal services. These solicitations and others which will be issued are expected to result in contracts in June and July 1977. They are to provide the requisite facilities, equipment and personnel for barging crude oil to docks near the individual sites as well as unloading and storing the oil at the site and at transshipment points. These service agreements will cover not only mid-1977 interim barge fill but also the pipeline fill for the sites lasting through 1978.

## CHAPTER III

### FEDERAL EXPENDITURES FOR THE ACCELERATED PROGRAM

#### SUMMARY

The total Federal outlay for developing a 500 MMB Reserve on the accelerated schedule is estimated to be between \$7.6 and \$8.8 billion. This represents a current-dollar decrease in total Federal expenditures of approximately \$200 million, as compared to the total expenditures under the original schedule. If the President's crude oil equalization tax proposal is approved by the Congress, and if imported oil prices rise with domestic inflation, the accelerated schedule could reduce Federal outlays by roughly \$560 million compared with the original schedule.

Although the accelerated schedule has higher site acquisition and administrative costs, these increases are expected to be more than offset by lower expenditures for petroleum procurement. Complete development of the 500 MMB Reserve by 1980, two years earlier than initially planned, allows the Government to acquire more of the oil prior to anticipated price increases.

#### ACCELERATION EXPENDITURES

Table III-1 summarizes the currently estimated Federal expenditures for the 500 MMB accelerated SPR. For comparison purposes, the estimated expenditures for the program on the previous schedule are also shown.

Basically, the difference between the two plans in terms of facilities is that the accelerated program is based on seven individual sites whereas the original plan was based on five sites. This increase is a result of the requirement to utilize as much existing storage capacity as possible for the accelerated program. The inclusion of two additional sites creates higher land acquisition, construction and administrative costs. The accelerated program is estimated

TABLE III-1

FEDERAL EXPENDITURE ESTIMATES FOR 500 MMB SPR  
COMPARING ORIGINAL AND ACCELERATED SCHEDULES  
(Dollars in Millions)

	<u>Original Schedule</u>	<u>Accelerated Schedule</u>	<u>Difference</u>
Site Acquisition	84.1	142.5	+ 58.4
Construction	606.3	624.5	+ 18.2
Oil Acquisition	6,496.4 <sup>a/</sup>	6,271.8	-224.6
Operations	75.5	18.2 <sup>b/</sup>	- 57.3
Administration	66.9	71.9	+ 5.0
Cargo Preference <sup>c/</sup>	<u>500.0</u>	<u>500.0</u>	_____
Subtotal	7,829.2	7,628.9	-200.3
Potential Increase in Oil Prices <sup>d/</sup>	<u>1,505.9</u>	<u>1,148.2</u>	-357.7
TOTAL	<u>\$9,335.1</u>	<u>\$8,777.1</u>	-558.0

a/ Original cost estimate of \$6,359.1 million presented in the SPR Plan is adjusted to reflect world crude oil price increase imposed in January 1977.

b/ Operations during fill covered in construction costs in accelerated program cost estimate.

c/ Estimate of additional cost of transporting 50 percent of the oil in U.S. flag tankers. The cost of transporting the oil in foreign flag tankers is included in the "oil acquisition" estimates.

d/ Estimate of impact of proposed crude oil equalization tax and potential oil price increases consistent with domestic inflation.

to cost approximately \$25 million more than the original plan in terms of site acquisition, construction, operations and administration. The construction estimates assume that no significant problems or delays will be encountered due to weather, strikes or other similar uncontrollable events. Experience with major construction projects indicates that such delays are not uncommon and may result in cost increases.

The increase in acquisition and construction costs is expected to be more than offset by a decrease in estimated expenditures for oil procurement. Expenditures for oil acquisition are currently estimated to be roughly \$225 million less under the accelerated schedule than under the original schedule in today's dollars. This estimate is based on a forecast of the national composite average price for crude oil, which is a weighted average of domestic crude prices and landed costs of imported crude oil. Table III-2 presents a range of crude oil prices reflecting different assumptions regarding world oil prices and U.S. domestic prices.

TABLE III-2

ESTIMATED EXPENDITURES FOR SPR CRUDE OIL  
(\$/BBL)

<u>Calendar Year</u>	<u>Estimated National Composite Average</u>	
	<u>Estimate A (1977 \$)</u>	<u>Estimate B (Nominal \$)</u>
1977	11.40	12.21
1978	11.98	13.86
1979	13.10	15.53
1980	13.84	17.27
1981	13.84	18.22
1982	13.84	19.21

The expenditures shown as Estimate A assume no increases in world oil prices by the major producing countries, but do include the increases imposed in January 1977. The estimates assume crude oil price decontrol as of May 1979, when FEA's mandatory petroleum price control authority expires. The expenditure estimates beyond May 1979 assume current world prices for crude oil.

Enactment of the President's proposal to impose a crude oil equalization tax would increase the national composite average price for crude oil. This tax, which is to raise the price of all domestically produced crude oil to world market prices by 1980, would increase the Reserve's oil acquisition expenditure by reducing the difference between the domestic average price of oil and the world price during 1978 and 1979. Once the tax is in place, U.S. oil prices would increase in accordance with the world price of oil as long as world oil prices do not increase significantly faster than the level of domestic inflation. The crude oil costs shown in Table III-2 as Estimate B, assume an annual 5.5 percent increase in world oil prices and enactment of the proposed equalization tax.

Estimate B does not include any possible increases in oil prices resulting from an oil supply shortage. If the world demand for oil increases without a corresponding increase in production, normal market pressures may result in somewhat higher oil costs than those shown in Table III-2. Projected market conditions for low sulfur (sweet) crude indicate that a supply-demand imbalance could exist and that SPR oil procurements may result in some upward pressure on prices of this crude type (see Chapter IV).

The 500 MMB Reserve is expected to result in Federal expenditures of between \$7.6 and \$8.8 billion. As shown in Table III-3, approximately 90 percent of the program's expenditures would be directly attributable to oil acquisition, including transportation. About 9 percent of the program's expenditures would be incurred in site acquisition, design, construction, and filling of the storage facilities. The remaining expenditures, about 1 percent of the total, would be for program administration during development and standby operations after development has been completed.

TABLE III-3

DISTRIBUTION OF FEDERAL EXPENDITURES FOR 500 MMB SPR  
(Accelerated Program)\*

	<u>\$ Millions</u>	<u>\$/Barrel</u>	<u>Percent of Total</u>
Site Acquisition	142.5	.29	1.6
Construction	624.5	1.25	7.1
Oil Acquisition	7,420.0	14.84	84.6
Operations	18.2	.04	.2
Administration	71.9	.14	.8
Cargo Preference	<u>500.0</u>	<u>1.00</u>	<u>5.7</u>
TOTAL	8,777.1	17.56	100.0

\*Assuming the proposed crude oil equalization tax and oil price rises consistent with domestic inflation rates.

## CHAPTER IV

### ECONOMIC IMPACTS OF ACCELERATING THE PROGRAM

#### SUMMARY

The accelerated program is expected to result in some additional impact on the world petroleum market compared to the previous schedule. While the impact on the higher sulfur (sour) crude oil market is expected to be generally insignificant, the SPR requirements for low sulfur (sweet) crudes may result in some upward pressures on prices of those crudes.

Given the small size of the SPR oil requirements compared with available capacity for production of sour crudes, acquisition of this type of oil for the accelerated program is unlikely to push up prices for these crudes. Low sulfur (sweet) crude prices are expected to continue their upward climb even in the absence of the accelerated SPR program. This is due to the present and projected high demand and limited incremental production capabilities for these crude types.

Acceleration of the SPR schedule is unlikely to result in any changes in the present petroleum market structure. Thus, no adverse effects on market competition within the U.S. petroleum industry are anticipated.

Accelerating the SPR schedule should not produce any major impacts upon domestic production of supplies or equipment. Construction for development of the Reserve will result in expanded production of the necessary supplies and equipment without perceptibly increasing prices. Manpower requirements for development of the SPR are expected to increase employment of workers, such as welders, electricians, and pipefitters. These additional demands on the labor force are not expected to have any inflationary impact on wage rates.

Gross National Product and employment effects of developing the SPR are estimated to be positive but negligible when compared to levels in the absence of the program. The maximum impact is projected to occur in 1979, when the program could increase GNP by about \$1.1 billion and could increase employment by about 26,000 jobs. The economic and employment impacts are based on SPR program expenditures within the domestic economy and do not include the recycling of SPR oil acquisition costs by OPEC nations.

#### OIL PRICES

Under the accelerated SPR program to store 500 MMB by the end of 1980, the maximum quantity of oil required for fill in any 12 month period is approximately 260 MMB, which will occur in the latter part of 1978 and the first part of 1979. This represents less than 2 percent of projected OPEC production for that period.

Table IV-1 shows estimates of SPR requirements compared with estimates of OPEC's estimated production and shut-in capacity. Over the entire period of 1977-1980, SPR requirements are projected to average approximately 3.8 percent of OPEC shut-in capacity.

TABLE IV-1

SPR REQUIREMENTS COMPARED TO OPEC CAPACITY  
(Thousands of Barrels Per Day (MB/D))

Year	<u>OPEC Production</u>		Total Oil Demand Non-SPR	<u>SPR Requirements</u>	
	<u>Total Capacity (MB/D)</u>	<u>Estimated Shut-In Capacity</u>		<u>Demand (MB/D)</u>	<u>Percent of OPEC Shut-In</u>
1977 <sup>a/</sup>	39,900	9,750	30,000	150	1.5%
1978	40,900	9,180	31,100	620	6.7
1979	42,000	9,300	32,300	400	4.3
1980	43,100	9,405	33,400	295	2.9

a/ July through December 1977.

In order to provide crude oils that can be utilized by U.S. refineries to replace imports lost during an interruption, it has been determined that about 65 percent of the Reserve should be intermediate gravity, high sulfur (sour), and about 35 percent should be light and intermediate gravity, with low sulfur (sweet). The market impact of these two crude types is likely to be significantly different.

### Sour Crudes

Table IV-2 shows the relationship between SPR requirements for sour crude oil and estimated OPEC capacity and shut-in capacity over the period of the accelerated program for this particular type of sour crude. The estimates for these sour crudes indicate that there is ample shut-in capacity to meet the peak demand in 1978, and no upward price pressures from SPR purchases are anticipated.

TABLE IV-2

SPR HIGH SULFUR CRUDE REQUIREMENTS COMPARED  
WITH ESTIMATED OPEC PRODUCTION

Year	Est. OPEC Capacity of Suitable Sour Crudes (MB/D)	Est. OPEC Shut-In of Suitable Sour Crudes		SPR Demand For Sour Crudes		
		MB/D	%	Demand (MB/D)	% of OPEC Capacity	% of OPEC Shut-In
1977	12,710	2,542	20	75	0.6	2.9
1978	13,726	2,608	19	482	3.5	18.5
1979	14,828	2,669	18	282	1.9	10.6
1980	16,010	2,722	17	157	0.9	5.8

The SPR requirement for sour crudes is small relative to total OPEC capacity and production. Adequate incremental production capacity exists to provide SPR needs without increasing prices. The accelerated SPR program is not expected to cause market perturbations, nor to support substantially prices that would otherwise be declining.

### Sweet Crudes

Table IV-3 shows the relationship between SPR requirements for sweet crude oil and OPEC production of these crudes. There is very little shut-in capacity of these sweet crudes. Recent trends suggest that the demand for low sulfur crudes will continue to be high. Unless additional supplies become available, market imbalances are likely to continue.

TABLE IV-3

SPR LOW SULFUR OIL REQUIREMENTS COMPARED WITH  
ESTIMATES OF OPEC PRODUCTION

<u>Year</u>	<u>Estimated OPEC Production of Suitable Low Sulfur Crudes (MB/D)</u>	<u>Estimated SPR Low Sulfur Requirements (MB/D)</u>	<u>SPR Requirements as a Percent of Estimated OPEC Low Sulfur Production</u>
1977	2,075	75	3.6%
1978	2,137	138	6.4
1979	2,201	118	5.4
1980	2,267	138	6.1

Because of the higher rate of fill under the accelerated schedule, the SPR requirements for sweet crudes under the accelerated program are expected to cause some small increase in market prices; these crudes are in short supply and the SPR needs may have to be met in part by bidding the oil away from current users. It is not possible to make any specific estimates at this time of the amount of any price increases that might occur as a result of the SPR sweet crude purchases.

Even without SPR requirements, these sweet crudes are projected to remain in high demand and their prices are expected to continue their upward trend. Therefore, SPR demands will likely contribute to, but will not be the sole cause for, increasing these prices.

In view of the potential impact of SPR oil purchases on the sweet crude market, several special steps are being taken to minimize any adverse economic impacts, including the following:

- o The procurement schedule is being designed to minimize the peak demand for sweet crude oil; this is an integral part of FEA's planning effort;
- o Specific procurement solicitations are being designed to minimize market problems and to elicit potential problems in the proposal process;
- o FEA is retaining the option of cancelling oil procurements at any time prior to award if there are indications that the market impact would be unacceptable; and
- o The crude oil market will be monitored during the course of the delivery of the oil and FEA will be prepared to terminate or modify the procurement if it is concluded that the market impact is unacceptable.

#### Impact of Entitlements Use

The use of the authorities granted in the Emergency Petroleum Allocation Act (EPAA) would allow the Government to obtain the benefit of domestic price controls for imported crude oil for the SPR to the same extent that those benefits accrue to domestic refiners that process imported crude oil under FEA's domestic crude oil allocation (Entitlements) program. Under this procedure, sellers of oil to the Government would be able to earn or be required to purchase Entitlements for volumes sold to the Government.

The Entitlement benefit or obligation (depending on whether imported or domestic oil is involved) would flow through to the Government since suppliers' offers would be subject to downward adjustment by an amount equal to the value of Entitlements at the time of supply. The price to the Government should be roughly equal to the national average composite price to refiners (including imports).

This method of acquiring the SPR oil for storage is projected to increase domestic prices of petroleum products by less than two-tenths of a cent per gallon during 1978 under the accelerated program. The increase in consumer prices will result from the SPR obtaining oil at the composite price of oil at world prices and lower priced domestic production. In effect, consumers will have to buy imported oil to replace the lower cost oil used for the SPR.

The President's proposed crude oil equalization tax would reduce the amount of the SPR costs to be passed along to consumers, because the difference between the composite price and the world price will be reduced by the equalization tax. With the equalization tax in effect, the use of the crude oil Entitlements Program in acquiring the SPR oil will increase petroleum prices to consumers by less than one-tenth of a cent per gallon during the peak oil procurement period of late 1978 and early 1979.

#### CONSTRUCTION IMPACTS

The impacts of SPR development on industries which produce the required construction materials, equipment, and electrical power necessary for construction and fill, and on the local labor forces in areas where SPR sites are located, were evaluated in Chapter X of the SPR Plan. Acceleration of the development and fill schedule will not significantly change the results discussed in that Chapter.

The estimated annual capital and development costs of filling the SPR (not including oil acquisition) are less than \$500 million (1977 dollars) in any year. This amount is small in relation to annual oil field expenditures; thus, significant adverse impacts due to SPR development are unlikely.

Manpower requirements for construction and site development were originally estimated to vary between 150 and 1,050 workers. The number of workers required could reach 1,500 during certain peak construction periods under the accelerated program. This slight increase in demand should produce no adverse effects. SPR development is likely to increase

employment in semi-skilled and unskilled categories in the second half of 1977 and 1978. It is also likely to result in favorable indirect effects on employment in the vicinity of the storage sites. The increased consumer demand for goods and services from the newly employed personnel will have "spill-over" effects and is likely to stimulate employment in other occupations.

The acceleration is expected to result in only small changes in the impact of the program on the communities in the vicinity of the storage sites. Every effort is being made to minimize any adverse impact on economic activity in the areas by permitting current commercial users of the sites to continue operations whenever possible with a minimum amount of disruption.

#### IMPACT ON COMPETITION

Accelerating the SPR program is unlikely to result in any major changes within the petroleum industry which would either stimulate or reduce the level of industry competition. Accelerating the program has the short-term effect of compressing the procurement schedule. However, the additional oil demand created by advancing the procurement schedule is extremely small relative to total oil demand within the industry.

#### MACROECONOMIC IMPACTS

Acceleration of the SPR development schedule is expected to augment GNP and employment increases estimated under the original SPR schedule.

Gross National Product and employment impacts resulting from the accelerated SPR program are compared to the original program in Table IV-4. These estimates are based on outlays for domestic facility development, standby operational expenditures, and for transportation of oil on U.S. flag ships. Oil acquisition costs which are assumed to be expended on foreign oil imports, and therefore accrue to foreign oil exporting nations, are excluded due to the uncertainty of how these nations will utilize these additional funds.

TABLE IV-4

COMPARATIVE GNP AND EMPLOYMENT INCREASES  
WITH AND WITHOUT THE ACCELERATED PROGRAM

<u>Year</u>	<u>GNP</u> <u>(Millions of 1977 Dollars)</u>		<u>Employment</u> <u>(Jobs)</u>	
	<u>With</u> <u>Acceleration</u>	<u>Without</u> <u>Acceleration</u>	<u>With</u> <u>Acceleration</u>	<u>Without</u> <u>Acceleration</u>
1977	268	268	6,826	6,826
1978	810	173	23,000	18,062
1979	1,095	522	26,300	18,170
1980	935	456	16,700	11,575

During the initial stages of the SPR program in 1977, the economic impact of construction, oil acquisition, and other major program activities is expected to be about the same under the accelerated program as without acceleration. During the peak period of program activities in 1978, GNP increases with and without acceleration are \$1,095 million and \$522 million, respectively.

During the peak period of the program, the accelerated program is expected to provide more than 8,000 additional jobs than would be provided without acceleration, 26,300 compared to 18,170.

## CHAPTER V

### ENVIRONMENTAL IMPACT OF THE ACCELERATED PROGRAM

#### SUMMARY

Preliminary analysis indicates that acceleration of the Strategic Petroleum Reserve Program to a storage capacity of 250 MMB of oil by 1978 and 500 MMB by 1980 can be implemented in an environmentally responsible manner, with the same safeguards and performance standards as are incorporated in the original SPR Plan. The detailed environmental impacts of system design and operation changes necessary to achieve the targeted acceleration are still being assessed, but it is expected that these changes will be environmentally acceptable and may actually reduce the environmental impact of the program. However, the acceleration does have the potential for additional impacts, and special attention will be focused on mitigation of these environmental impacts.

The environmental impacts of the SPR Plan are presented in the SPR programmatic final environmental impact statement (EIS), published by the Federal Energy Administration in December 1976. In addition, final site-specific EISs have been completed for five proposed storage sites, and EISs for more than a dozen other potential sites are in preparation.

The estimates of the incremental impacts associated with achieving the storage of 500 MMB by 1980 rather than by 1982 are based on the types and extent of the impacts anticipated from the original fill schedule. Due to the acceleration of the SPR schedule, the environmental impact of developing the Reserve may be somewhat intensified since the activities associated with the development will be compressed into a shorter timeframe. The final determination of impacts will depend on the specific sites selected for storage, since most of the impacts as well as the specific mitigation measures to be implemented are related to the individual sites.

In order to estimate the environmental impact of the acceleration of the SPR schedule, it was assumed that supplementary storage capacity would be developed at two or three additional sites, either by selection of sites with existing capacity, expansion of sites with existing capacity or facilities, or by development of new capacity at undeveloped sites.

#### POTENTIAL ENVIRONMENTAL IMPACTS

The major environmental impacts related to the development of storage sites, oil acquisition, fill and withdrawal operation, and distribution during a supply interruption include: (1) temporary, localized disruption during storage site construction or expansion; (2) deep-well injection or Gulf disposal of brine resulting from leaching new salt caverns or the displacement of brine during fill operations; (3) marine-related dredging and facility construction, including tanker terminals, barge docks, enlargement of slips, and emplacement of ballast tanks; (4) pipeline deployment; (5) hydrocarbon evaporative losses during fill and withdrawal of oil; and (6) oil spill risk from the transport of oil to and from the storage facilities.

Total cumulative impacts of the storage of 500 MMB under the original fill schedule and under the proposed acceleration from 1982 to 1980 are the same and are summarized in Table V-1. Specific local environmental impacts are, or will be discussed in the site-specific EISs prepared for each candidate storage site. The major environmental considerations resulting from the expansion of existing sites and the selection of two or three new sites, as well as the impacts of increasing the crude oil throughput during the storage fill phase, are discussed below.

TABLE V-1  
 MAXIMUM CUMULATIVE IMPACTS  
 (500 MMB RESERVE)

<u>Air</u>	Marine Vessel Unloading	3,090 Tons of HC/Year
	Marine Vessel Loading	3,130 Tons of HC/Year
<u>Water</u>	Brine Disposal:	
	Produced during Solution Mining	49 Billion Gallons
	Produced during Displacement with Oil	16 Billion Gallons
	TOTAL	<u>65</u> Billion Gallons
	Water Requirements:	
	Required for Solution Mining	39 Billion gallons Freshwater (or) 43 Billion Gallons Seawater
	Required for Displacement	16 Billion Gallons Freshwater (or) 15 Billion Gallons Seawater
	TOTAL	<u>55</u> Billion Gallons Freshwater (or) <u>58</u> Billion Gallons Seawater
<u>Land Use</u>		Approximately 700 Acres

Air Pollution Impacts

New storage site development would result in fugitive dust emissions due to land clearing and other construction activities. The air quality impacts are site-specific and short-term and dependent upon local soil characteristics, climate, amount of construction activity, and dust control measures. Emissions from diesel-fueled equipment during construction are estimated to be slight.

Normal operations during storage will contribute minor amounts of hydrocarbon (HC) emissions. Small aboveground surge tanks at each site would emit HC, even during inactive storage periods. The largest surge tank under consideration, 400,000 barrels, would emit only 120 pounds of HC per day.

The most significant air pollutant emissions from the program would result from the transfer of oil between the tankers and barges and the storage caverns during fill operations. The total cumulative emissions would remain the same, but their short-term adverse impact on air quality would be somewhat greater because they would occur over a shorter period of time. A conservative estimate of HC emissions from vessel unloading (based on the standard emission factor for gasoline, rather than crude oil, which is less volatile than gasoline), was calculated in the programmatic EIS. Estimated HC emissions for the Reserve, based on more recently available emission factors, are shown in Table V-1. Assuming, for purposes of illustrating a conservative environmental scenario, that all of these emissions would be located in the Gulf Coast region, the estimated worst case in HC emissions under the accelerated program would be less than 1.2% of the total HC emissions estimated for 1972 in the region. Furthermore, during the withdrawal phase (vessel loading), triggered by an interruption of imported oil, any emission that would occur would be in lieu of those emissions that would normally occur as a result of crude oil handling in the area, and would be less than those normally occurring because much of the oil would go from underground storage directly into major commercial pipelines.

### Brine Disposal

When developing a new cavern or modifying an existing cavern in a solution-mined salt dome, water is injected into the dome to dissolve the salt. This process, called leaching, results in substantial quantities of brine. For new storage caverns, it is estimated that approximately 7 barrels of brine are produced in leaching one barrel of oil storage capacity. Quantities of brine to be disposed of for the 500 MMB reserve are shown in Table V-1.

Brine may be disposed of by deep-well injection or transportation by pipeline to the Gulf of Mexico. Deepwell injection refers to placing the brine, generally under pressure, in permeable strata beneath a confining layer that isolates the injected fluid from potable water supplies and other elements of the biosphere. Because of the depth of the receiving saline aquifer, the risk of contamination of shallower, freshwater aquifers is remote.

Brine disposal in the Gulf of Mexico would require transporting brine several miles offshore through pipelines, and dispersing the brine into seawater. This method of brine disposal would increase salinity near the point of discharge and, unless mitigating steps are taken, could adversely affect the local aquatic community. Impacts are site-specific and must be addressed for each candidate storage site.

During the withdrawal phase, oil in storage caverns would be displaced by pumping freshwater, seawater, or brine into the cavities. Sufficient water is available from the Gulf of Mexico and surface water sources for this purpose.

#### Oil Spill Risk

Actual spill risk and size are dependent on many factors, including the amount of oil handled, methods of handling, types of transport, and location. Under worst case assumptions, about six accidents resulting in spills were predicted to occur during the fill phase of the original 500 MMB program; this is projected to be somewhat less during the accelerated program. However, some chronic oil pollution due to normal loading and unloading operation is likely. Such pollution will be minimized through careful planning and implementation of operational safeguards. Under the accelerated program, consideration is being given to filling the Weeks Island site by pipeline rather than by barging. Use of a pipeline will permit a substantial increase in the possible fill rate, and it now appears to be environmentally safer than the use of barges.

The environmental impacts of spills depend on spill locations and quantity, control measures, and weather. A large spill would have the most severe impacts if it occurred very close to shore in the Gulf or in a major estuary area surrounded by productive wetlands.

## MITIGATIVE MEASURES

The FEA is committed to implementing the entire storage program in an environmentally sound and responsible manner. This commitment is demonstrated in three areas: (1) compliance with the National Environmental Policy Act (NEPA); (2) compliance with the other Federal environmental regulations, and with the substance of State and local regulations; and (3) the preparation of an Environmental Plan, providing for maximum environmental protection within the constraint of timely and economic achievement of the storage goals. This commitment is an extension of the policy established in the approved SPR Plan, submitted to Congress as Energy Action No. 10 on February 16, 1977, to incorporate environmental considerations into the development of the storage program.

In this regard, EISs will be prepared for each of the new storage sites proposed, as well as for any expansions of existing sites considered to have significant environmental impacts. The preparation of a supplement to the programmatic EIS will also be considered.

The accelerated SPR Program will comply with the regulatory and permitting requirements of the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Coast Guard, and other environmental, safety, historic, and wildlife preservation agencies.

In addition, Federal statutes (specifically the Clean Air Act, the Federal Water Pollution Control Act, the Noise Pollution Control Act and the Coastal Zone Management Act) require the FEA to comply with the substance of State and local requirements concerning air, water, and noise pollution. As part of the Environmental Plan, the FEA will develop environmental protection criteria to be factored into the oil procurement process. Oil spill contingency procedures will be developed to minimize the amount of oil spilled and to control impacts on sensitive environmental areas. Performance and design criteria will be established for facility siting, design, construction, and operation.

Measures to mitigate air quality impacts due to hydrocarbon emissions during fill and withdrawal phases will be considered. In addition, the use of floating roof tanks, vapor flaring and vapor recovery systems to lower hydrocarbon emissions will be investigated.

Impacts due to brine disposal by deep-well injection can be mitigated through careful engineering design of the brine disposal field. Careful monitoring of the brine injection process can minimize impacts that may occur during pipeline breaks or from plugged wells. Impacts on aquatic life due to brine disposal by Gulf outfall can also be mitigated through a variety of approaches. For example, studies are being conducted by the National Oceanic and Atmospheric Administration to identify aquatic areas of highest productivity for sensitivity; the brine outfall can then be located away from these areas. Careful design of the diffuser, including depth and configuration, can maximize salinity dispersion and minimize impacts on aquatic life.

Careful attention to these efforts will allow the SPR to be implemented in an environmentally sound and responsible manner within the accelerated timetable.

## APPENDIX

### STORAGE SITES SELECTED

This appendix presents a detailed description of four ESR sites selected for SPR crude oil storage in 1977 and 1978. The following is presented for each site:

- o A description of the location, estimated capacity, ownership and availability of the site. For the three sites already acquired by FEA -- Bayou Choctaw, Bryan Mound, and West Hackberry -- the owners prior to acquisition are identified. For the Weeks Island site, which has not been acquired, the current owner is identified.
- o Planned or potential systems for filling and withdrawing oil from the site, including the facilities which will be used for initial fill of the site, and a summary of the important factors related to fill and withdrawal of oil at the site.
- o A description of the facilities required to convert the site for oil storage purposes. For solution caverns in salt domes, these facilities include new cavern wells and the brine disposal and water supply systems. For the mine, the facilities include modifications within the mine and construction of a pump shaft.

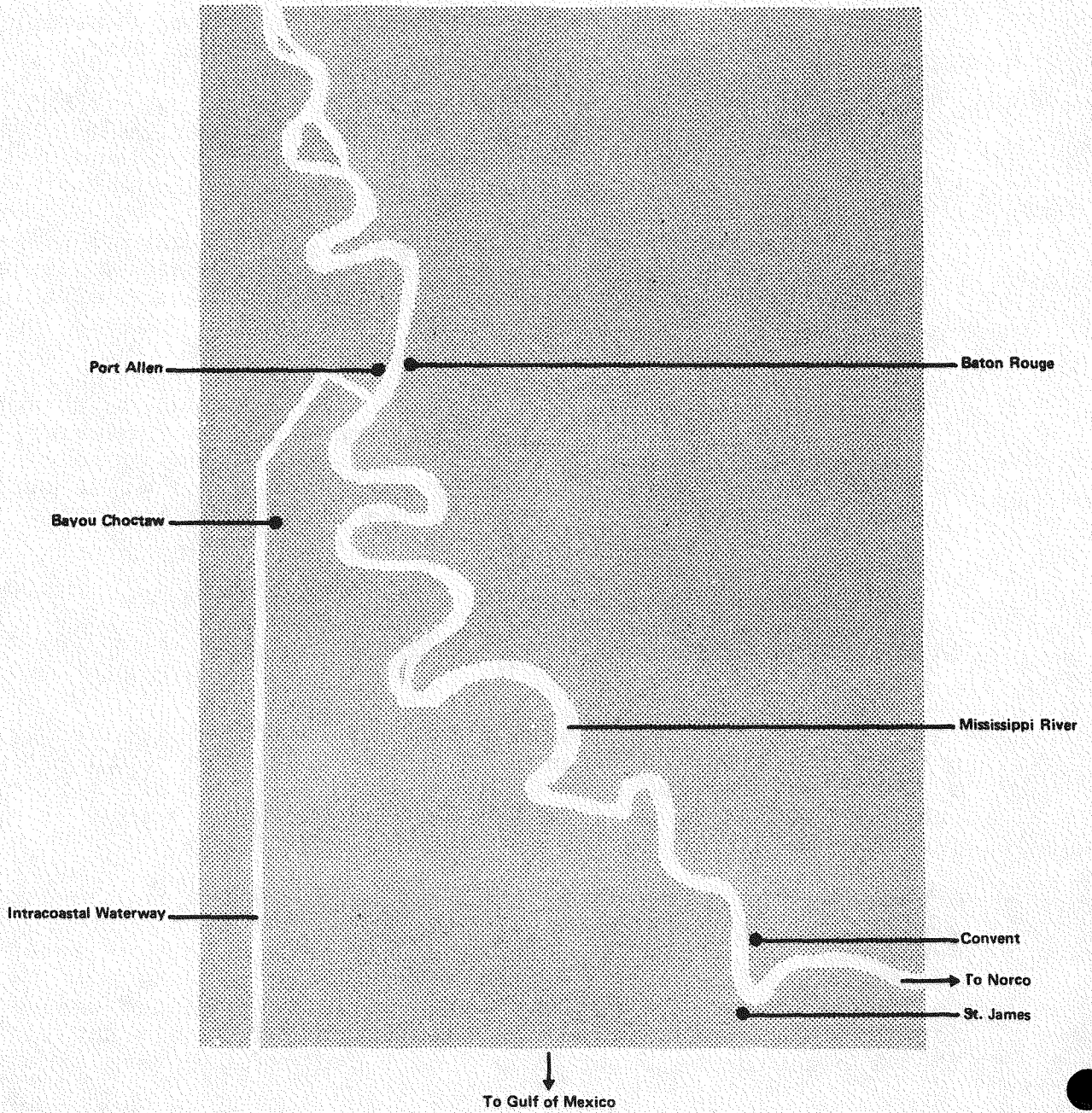
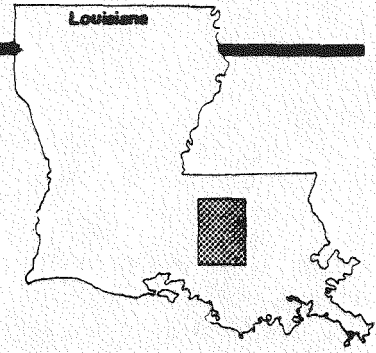
#### BAYOU CHOCTAW SALT DOME

The Bayou Choctaw salt dome is located in the east central portion of Iberville Parish, Louisiana, 12 miles southwest of Baton Rouge. The dome lies approximately 60 miles from the Gulf of Mexico and 4 miles west of the Mississippi River (see Figure 1).

Of the 23 leached caverns that have been created in the dome, 6 have been plugged or abandoned, 2 have not been fully developed, 6 are dedicated (i.e., they have been contracted out to other users), and 9 are uncommitted. Of the 6 dedicated caverns, 1 will be made available over the near-term for oil storage when new space is created as a substitute. The usable storage capacity of the 1 dedicated cavern plus

FIGURE 1

**BAYOU CHOCTAW  
LOCATION**



the 9 uncommitted caverns totals approximately 74 MMB. While all of the caverns still need to be tested, present information indicates that all caverns should be suitable for oil storage.

Prior to acquisition by FEA, surface ownership was split among many parties (see Table 1). Allied Chemical (Houston, Texas) held surface and mineral leases for the entire dome since 1934 and produced brine for use in chemical operations at the rate of about 34,000 barrels per day. The six dedicated caverns were leased by Allied to Shell, Exxon, Conoco, and Dow for hydrocarbon product storage. FEA acquired the Bayou Choctaw site on April 27, 1977, and took possession on May 11, 1977.

#### Distribution

The initial fill of Bayou Choctaw will be accomplished by barging to the existing Allied barge docks on Bull Bay near the site. An existing pipeline from the docks to the site will be used to initially fill the site at a rate of about 30,000 barrels per day. Barges will be loaded at existing crude oil barge/tanker terminal facilities located on the Mississippi River in the area between New Orleans and Baton Rouge. Although this interim fill system could be used for withdrawal, its operating costs and limited withdrawal capability make the pipeline options described below attractive.

There are two oil distribution alternatives presently under evaluation by FEA for Bayou Choctaw. Unlike the interim barge fill system, both of these pipeline alternatives would permit the fill of the site by the end of 1978 and total drawdown of the site could be accomplished in 150 days.

#### Option 1: Tanker Docks at St. James and New 39-Mile FEA Pipeline

For fill, tankers would be off-loaded at existing tanker docks at the terminal in St. James, Louisiana, at an average rate of up to 240,000 barrels per day. A new dock may be required due to the heavy use of existing docks. The oil would then be transported to Bayou Choctaw through a new 39-mile FEA pipeline. Existing facilities at St. James terminal have a capability to throughput crude oil at a rate of up to 1,370,000 barrels per day; the 150-day drawdown rate is 493,000 barrels per day.

Option 2: Two New FEA Tanker Docks on the Mississippi River and New 5-Mile FEA Pipeline

For fill, tankers would be off-loaded at two new tanker docks to be built on the Mississippi River at an average rate of up to 480,000 barrels per day. The oil would then be transported to the site through a new 5-mile FEA pipeline. The tanker and barge docks and other facilities would be designed to support an average withdrawal rate of up to 493,000 barrels per day which is the 150-day drawdown rate.

Facilities

The major facilities needed at Bayou Choctaw are new cavern wells, a brine disposal system, and water supply/injection system. New cavern wells may be required to support the design flow rates.

Brine, produced during cavern fill, can be disposed of by (1) transporting it via FEA pipelines to the Gulf of Mexico (approximately 60 miles); (2) delivering it to local industrial users at a rate of up to 34,000 barrels per day; and/or (3) injecting it into the ground through brine disposal wells. Of these three possible disposal methods, disposal via injection wells is the primary method planned for Bayou Choctaw although FEA will make brine available to local industry as the need arises. Initial fill of the site will be accomplished using a test brine disposal well planned for the site.

The water supply/injection system will inject raw water from an on-site lake in the northwest corner of the storage area which is supplied by the Intracoastal Waterway, into the oil-filled caverns to force oil out during the withdrawal phase.

TABLE 1

INDIVIDUALS WITH PROPERTY INTERESTS AT THE  
BAYOU CHOCTAW STORAGE SITE

(Names and Addresses of Individuals with Ownership and  
Other Property Interests Prior to FEA Acquisition)

Gulf Oil Corporation  
F/K/A Gulf Refining Company  
Resident Agent for Process:  
C. T. Corporation Systems  
1300 Hibernia Bank Bldg.  
New Orleans, La. 70112

Wabash Magnetics, Inc.  
F/K/A Deluxe Coils, Inc.  
F/K/A Western Hemisphere Petroleum Corporation  
Resident Agent for Process:  
Secretary of State for Louisiana  
Baton Rouge, Louisiana

Jill Leda Appleman  
A/K/A Jill Leda Appleman Roberts  
Susan Appleman  
A/K/A Susan Appleman Unterberg  
Baron U. Kidd  
John R. Less  
c/o So-Roy Corporation  
1712 Commerce Street  
Room 900  
Dallas, Texas 75201

Southeastern Public Service Company  
Resident Agent for Process:  
United States Corporation Company  
1101 American Bank Building  
New Orleans, La. 70130

Klein G. Wilbert et ux  
Annie Ray Miller Wilbert  
Rt. 1, Box 156  
Plaquemine, La. 70764

Mrs. Ann B. Wilbert Arbour et vir  
Sidney Arbour  
2020 Ramsey Drive  
Baton Rouge, La. 70808

Mrs. Marion Wilbert Benbow et vir  
Robert H. Benbow  
3400 Texas Avenue  
Bryan, Texas 77801

Mrs. Florence Lewins Bryant, Usufructuary (Widow)  
Route 1, Box 704 C  
Plaquemine, La. 70764

Joseph Wilbert Bryant, Jr. et ux  
Janet Miranda Bryant  
Route # 1, Box 704 C  
Plaquemine, La. 70764

Riette Sue Bryant (Single)  
608 E. Wright Street  
Jasper, Alabama 35501

William E. Bryant (Single)  
406 Court Street  
Plaquemine, La. 70764

Mrs. Alberta Wilbert Buquoi et vir  
Allen P. Buquoi  
906 Fort Street  
Plaquemine, La. 70764

James Burke Cassidy  
Trustee for Frederick Paul Wilbert Cassidy  
Route #2, Box C-251  
Independence, La. 70443  
Frederick Paul Wilbert Cassidy  
Route 4, Box 191-A  
Franklinton, La. 70438

James Burke Cassidy et ux  
Janice Villere Cassidy  
Route #2, Box C-251  
Independence, La. 70443

John Frederick Cassidy et ux  
Joanne Lang Cassidy  
104 Ave. F  
Coco Plum Beach, Florida 32931

William Elmore Cassidy, Jr. et ux  
Patricia Bofcareno  
2004 Bonnie Street  
Metairie, La. 70001

Charles Ray Champagne, Jr. et ux  
Brenda Corrent Champagne  
714 Fort Street  
Plaquemine, La. 70764

Mrs. Hattie Grace Clifton et vir  
Clarence C. Clifton  
Rt. #1, Box 590  
White Castle, La. 70788

Abel W. Cline, Jr. et ux  
Jane Loftis Cline  
A/K/A Abel Waddill Cline, Jr.  
10002 Edmond Lane, Apt. 74  
Lewisville, Texas 75067

George Wilbert Cline et ux  
Margaret Fishel Cline  
Frogmore, South Carolina 29920

Clarence C. Clifton, Jr.  
1224 First National Bank of Commerce Building  
210 Baronne Street  
New Orleans, La. 70112

TABLE 1  
(Continued)

Mrs. Celeste W. Gascon et vir  
C. A. Gascon, Jr.  
1500 South River Road  
Plaquemine, La. 70764

Mrs. Gertrude Wilbert Gauthier et vir  
W. G. Gauthier  
921 Elm Street  
Plaquemine, La. 70764

Mrs. Lydia A. Wilbert Grace et vir  
Michael Grace  
A/K/A Lydia A. Wilbert  
1020 Osage Street  
Plaquemine, La. 70764

Mrs. Nancy Jane Wilbert Hagney et vir  
Dennis Hagney  
A/K/A Nancy Jane Wilbert  
340 Walter Road  
River Ridge, La 70123

Mrs. Janet Wilbert Hargrove  
801 LaBauve Ave.  
Plaquemine, La. 70764

John Aston Hickman et ux  
Ouida Nash Hickman  
999 Contraband Lane  
Lake Charles, La. 70601

Mrs. Mary Ione Wilbert Higdon et vir W.  
Brooks Higdon  
A/K/A Mary Ione Wilbert  
808 Fort Street  
Plaquemine, La. 70764

Frederick Wilbert Kearny et ux  
Louise Jolly Kearny  
1121 Belvedere-Meadow Lea Subdivision  
Baton Rouge, La. 70808

Mrs. Lilla Bryant Schwing Knapp et vir  
Alfred Knapp  
A/K/A Lilla Bryant Schwing  
3239 Delmonte Drive  
River Oaks Subdivision  
Houston, Texas 77019

Mrs. Germaine Wilbert Laville et vir  
L. P. Laville  
207 Laville Street  
Plaquemine, La. 70764

Louisiana National Bank of Baton Rouge  
Trustee for Charles Ray Champagne, Jr. Trust  
C/O Mr. John Adkins, Trust Department  
451 Florida Street  
Baton Rouge, La. 70801

Louisiana National Bank of Baton Rouge  
Trustee for Etta Lee Wilbert Payne Trust  
C/O Mr. John Adkins, Trust Department  
451 Florida Street  
Baton Rouge, La. 70801

Mrs. Susan Hickman Marionneaux et vir  
Rodney P. Marionneaux  
901 Tenth Street  
Lake Charles, La. 70601

Mrs. Lucille W. Martinez et vir  
Rome D. Martinez  
605 Court Street  
Plaquemine, La. 70764

Mrs. Patricia Bryant Medlen et vir  
Richard Alfred Medlen  
1520 Pecan Place Drive  
Plaquemine, La. 70764

William M. Nuttal et ux  
Kathryn Adams Nuttal  
Rt. 1, Box 155  
Plaquemine, La. 70764

Mrs. Etta Lee W. Payne et vir  
Joseph E. Payne  
308 Orleans Street  
Biloxi, Mississippi 39531  
Attorney for Mrs. Etta Lee W. Payne:  
Mr. Bobby G. O'Barr  
1117 W. Howard Street  
Biloxi, Mississippi 39530

Mrs. Maria T. Wilbert Reeves et vir  
Edwin M. Reeves, Sr.  
1122 Osage Avenue  
Plaquemine, La. 70764

Mrs. Mary Moll Wilbert Schroeder et vir  
William F. Schroeder  
1508 Riverview Road  
Chattanooga, Tennessee 37405

Mary Alta Cassidy Strong  
9416 Caribbean Boulevard  
Miami, Florida 33189

TABLE 1  
(Continued)

Mrs. Ruth Rose W. Templet  
804 Elm Street  
Plaquemine, La. 70764

Mrs. Ruth W. Templet  
1004 Osage Avenue  
Plaquemine, La. 70764

Mrs. Carolyn Ann W. Thibaut et vir  
John Thibaut  
Rt. 2, Box 489  
Napoleonville, La. 70390

Mrs. Mable Helen Cassidy Tiemann et vir  
Joseph M. Tiemann  
A/K/A Mable Helen Cassidy  
4417 Napoli Drive  
Metairie, La. 70002

Mrs. Suzanne Wilbert Turner et vir  
Burt Turner  
741 Delgado Drive  
Baton Rouge, La. 70808

A. Wilbert's Sons Lumber and Shingle Company  
100 Bayou Road  
Plaquemine, La. 70764

Mrs. Alphonsine C. Wilbert (Widow)  
102 Crescent Place  
Donaldsonville, La. 70346

Andrew M. Wilbert et ux  
Leona Leblanc Wilbert  
609 Court Street  
Plaquemine, La. 70764

Anthony M. Wilbert, Jr. (Single)  
5601 Paris Avenue  
New Orleans, La. 70122

Berchmans S. Wilbert et ux  
Marie Gross Wilbert  
508 Court Street  
Plaquemine, La. 70764

Calvin Willard Wilbert (Single)  
910 Fort Street  
Plaquemine, La. 70764

Charles Phillip Wilbert (Single)  
3830 Carruth Blvd.  
Dallas, Texas 75225

Bessie Suarez Wilbert (Widow)  
720 Fort Street  
Plaquemine, La. 70764

George Wilbert et ux  
Marian Loubierre Wilbert  
311 Bayou Road  
Plaquemine, La. 70764

Miss Germaine L. Wilbert  
4467 38th Street  
Zachary, Louisiana 70791

Mrs. Gertrude Pope Wilbert  
666 Stanford Ave.  
Baton Rouge, La. 70808

Mrs. Ione L. Wilbert, Usufructuary  
720 Robertson Street  
Plaquemine, La. 70764

Irwin Paul Wilbert et ux  
Gloria Rivault Wilbert  
Port Allen Highway  
Route # 1, Box 31  
Plaquemine, La. 70764

Mrs. Ida Lee King Wilbert, Usufructuary  
Naked Owners:  
Celeste G. Wilbert  
Germaine L. Wilbert  
Anthony M. Wilbert, Jr.  
2011 Stuart Ave.  
Monroe La. 71201

Mrs. Janice W. Wilbert  
906 Elm Street  
Plaquemine, La. 70764

Joanne Elizabeth Wilbert (Single)  
4046A Hawthorne  
Dallas, Texas 75219

Joseph Peter Wilbert et ux  
Mary O'Donnell Wilbert  
3830 Carruth Blvd.  
Dallas, Texas 75225

Joseph Peter Wilbert, Jr. et ux  
Mary Ridgley Dohm Wilbert  
5807 Northaven  
Dallas, Texas 75230

TABLE 1  
(Continued)

Mrs. Lillian D. Wilbert (Widow)  
720 Robertson Street  
Plaquemine, La. 70764

Peter G. Wilbert et ux  
Gloria Gaunt Wilbert  
#5 N. Lark Street  
New Orleans, La. 70124

Thomas A. Wilbert, Jr. (Single)  
906 Elm Street  
Plaquemine, La. 70764

William Pope Wilbert et ux  
Sofie Baltodano Wilbert  
5612 Grover Avenue  
Apt. 102  
Austin, Texas 78756

Mrs. Lilla Wilbert Williams et vir  
John D. Williams, Jr.  
1601 Maple Street  
Plaquemine, La. 70764

Mrs. Maude Bryant Winston et vir  
William D. Winston  
820 Turquoise  
New Orleans, La. 70124

Harris Trust and Savings Bank  
Trustee by Deed of Trust for  
Southeastern Public Service Company  
111 West Monroe Street  
Chicago, Illinois 60690

Henry A. Carrington  
Individual Trustee by Deed of Trust for  
Southeastern Public Service Company  
c/o Marine Bank and Trust Company  
Tampa, Florida 33601

William G. Webb  
Trustee by Mortgage Deed of Trust and  
Assignment for  
Ulster Corporation  
c/o Empire Trust Company  
Oil and Natural Gas Department  
20 Broad Street  
New York, New York 10005

Mr. Louis Nereaux, Jr.  
Tax Collector for Iberville Parish  
Courthouse  
Plaquemines, La. 70764

Shirley McNamara  
Louisiana State Revenue Collector  
Louisiana State Capitol Annex  
Baton Rouge, Louisiana 70804

Wilbert Mineral Corporation  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, Louisiana 70804

Adams Oil and Gas Company  
F/K/A Adams Royalty Company  
Resident Agent for Service of Process;  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Standard Oil Company of Louisiana  
F/K/A Standard Oil Company  
Resident Agent for Service of Process:  
C. T. Corporation  
1300 Hibernia Bldg.  
New Orleans, La. 70112

T. M. Hoffman and Mildred Hoffman  
Star Route Box 55-C  
Grosse Tete, La. 70740

Wilbert's Myrtle Grove Planting and Manufacturing Company  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Leasehold Interest, Inc.  
Resident Agent for Service of Process:  
C. T. Corporation  
1300 Hibernia Bldg.  
New Orleans, La. 70112

Gulf States Utilities Company  
Resident Agent for Service of Process:  
Virgil M. Shaw  
446 North Blvd.  
Baton Rouge, La. 70801

Parish of Iberville  
Police Jury  
Courthouse  
Plaquemine, La. 70764

Secretary of the Department of Transportation  
and Development  
Office of Highways  
Department of Transportation and Development  
Office of Highways  
F/K/A Louisiana Department of Highways  
1201 Capitol Access Road  
Baton Rouge, La. 70804

Plaquemine Water Works Association, Inc.  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, Louisiana 70804

TABLE 1  
(Continued)

Coastal Transmission Corporation  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Texas Eastern Transmission Corporation  
Resident Agent for Service of Process:  
C. T. Corporation  
1300 Hibernia Bldg.  
New Orleans, La. 70112

Louisiana Public Utility Company  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Baton Rouge Electric Company  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

South Central Bell Telephone Company  
F/K/A Southern Bell Telephone and Telegraph Company  
Resident Agent for Service of Process:  
James W. Hammett  
1215 Prytania Street  
New Orleans, La. 70140

Louisiana Crusader Oil, Inc.  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Oil and Gas Property Management, Inc.  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Texas Gas Exploration Corporation  
F/K/A Texas Gas Exploration Company  
Resident Agent for Service of Process:  
CT Corporation System  
1300 Hibernia Bank Building  
New Orleans, Louisiana 70112

John F. Flannery  
4006 Ella Lee Lane  
Houston, Texas 77027

Louark Producing Company  
merged into Carter Oil Company  
merged into Humble Oil and Refining Company  
Resident Agent for Service of Process:  
CT Corporation  
1300 Hibernia Bank Building  
New Orleans, La. 70112

Solvay Process Company merged into  
Allied Chemical Corporation  
F/K/A Allied Chemical and Dye Corporation  
Resident Agent for Service of Process:  
CT Corporation  
701 Fidelity National Bank  
Baton Rouge, Louisiana 70801

Freeport Mineral Company  
F/K/A Freeport Sulphur Company  
Freeport Oil Company a division of the  
former Freeport Sulphur Company  
Resident Agent for Service of Process:  
CT Corporation  
701 Fidelity National Bank  
Baton Rouge, Louisiana 70801

Brock Exploration Corporation  
F/K/A Brock Exploration Company  
F/K/A Precise Exploration Corporation  
Resident Agent for Service of Process:  
Lawrence E. Brock  
150 Baronne Street  
New Orleans, La. 70112

Texas City Refining Corporation  
Resident Agent for Service of Process:  
CT Corporation  
701 Fidelity National Bank  
Baton Rouge, Louisiana 70801

Lawrence E. Brock  
150 Baronne Street  
New Orleans, La. 70112

Putnam Workover Corporation  
Lawrence C. Brock  
202 Pere Marquette Building  
New Orleans, La. 70112

C. B. Pennington  
2085 S. Acadian Thruway  
Baton Rouge, La. 70806

Fidelity National Bank of Baton Rouge  
440 Riverside Mall  
Baton Rouge, La. 70802

Four R, Company  
Louisiana Secretary of State  
Baton Rouge, Louisiana

A. Leon Hebert, Trustee for Barbara Louise Kearny and  
Frederick Wilbert Kearny, Jr.  
617 North Boulevard, Suite 401  
Baton Rouge, La. 70802  
Barbara Louise Kearny  
1121 Belvedere Drive  
Baton Rouge, La. 70808  
Frederick Wilbert Kearny, Jr.  
1121 Belvedere Drive  
Baton Rouge, La. 70808

TABLE 1  
(Concluded)

Jo Ellen Kearny  
1121 Belvedere Drive  
Baton Rouge, La. 70808

Mortgage by Etta Lee Wilbert Payne and  
James E. Payne to Future Holders  
Mr. Sprague Pugh, Present Holder  
Iberville Bank  
Plaquemine, Louisiana 70764

Florence W. Cline et vir  
Abel Cline  
319 Rock Street  
Bowie, Texas 76230

Ione Leblanc Wilbert, Usufructuary  
c/o Mrs. Mary Ione Wilbert Higdon  
808 Fort Street  
Plaquemine, La. 70764

Alta Cassidy Fennell et vir  
Ray Norman Fennell  
(Address unknown)

Polk Avenue Trust Company  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

So-Roy Corporation  
Resident Agent for Service of Process:  
Louisiana Secretary of State  
Baton Rouge, La. 70804

Waldemar Von Zestwitz  
(Address unknown)

Sohio Producing Company  
Merged into Sohio Petroleum Company  
Resident Agent for Service of Process:  
C. T. Corporation Systems  
1300 Hibernia Bank Building  
New Orleans, La. 70112

Dow Chemical Company  
Resident Agent for the Service of Process:  
C. T. Corporation System  
1300 Hibernia Bldg.  
New Orleans, La. 70112

Humble Pipeline Company  
Resident Agent for Service of Process:  
Victor A. Sachse or Maurice J. Wilson  
701 Fidelity National Bank  
Baton Rouge, La. 70801

Texas Pacific Oil Company, Inc.  
Resident Agent for Service of Process:  
CT Corporation System  
1300 Hibernia Bank Building  
New Orleans, Louisiana 70112

LVO Corporation  
Resident Agent for Service of Process:  
CT Corporation  
1300 Hibernia Bank Building  
New Orleans, La. 70112

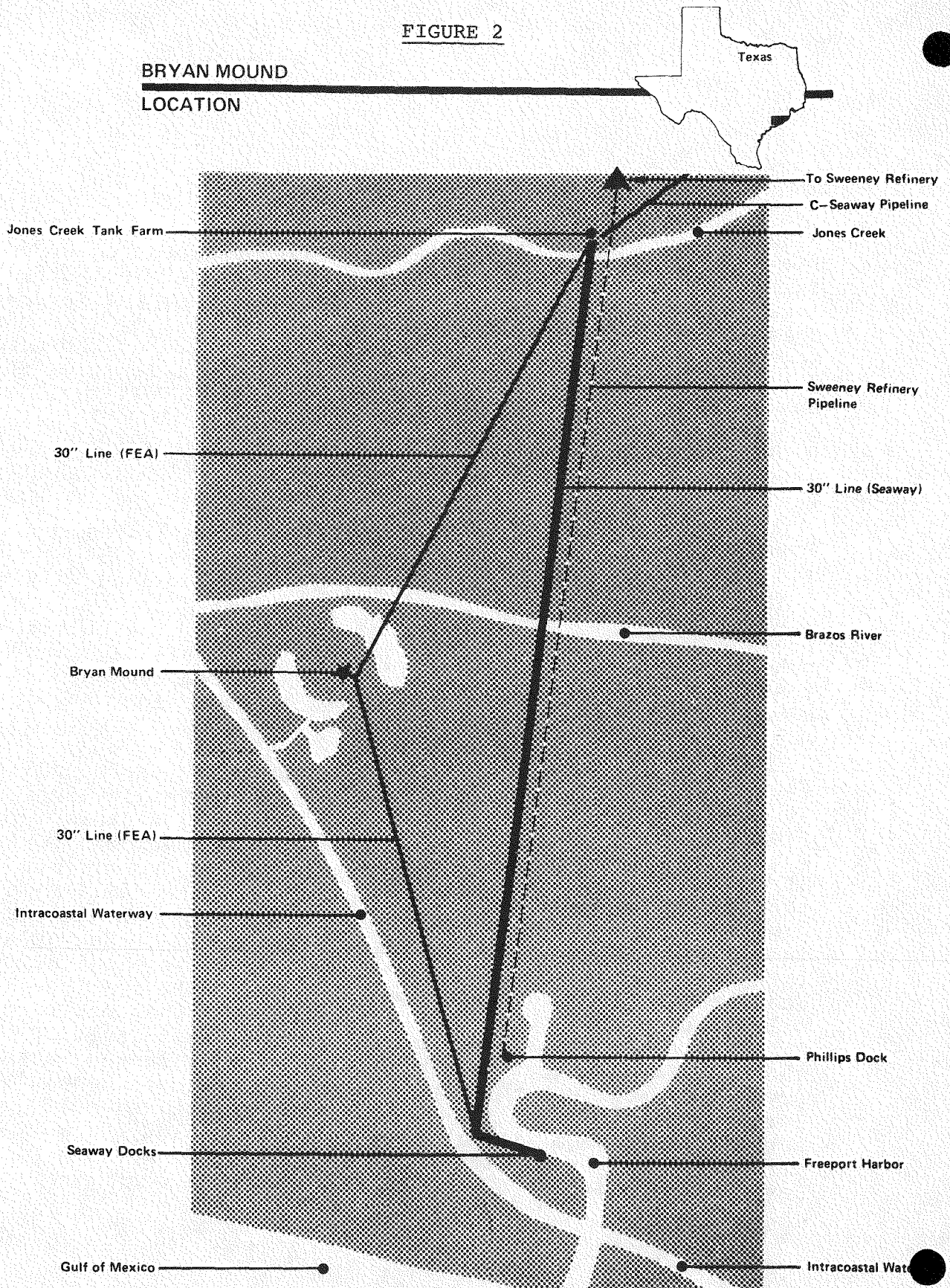
## BRYAN MOUND SALT DOME

The Bryan Mound salt dome is in southern Brazoria County, Texas, about 2.5 miles southwest of the town of Freeport, Texas. The dome lies approximately 1 mile from the Intra-coastal Waterway, 2 miles from the Gulf of Mexico, with the New Brazos River Channel abutting the west side of the dome, 3.6 miles from the port of Freeport, and 4.6 miles from the newly constructed (1976) Seaway Pipeline Incorporated-owned pipeline tank farm at Jones Creek. The tanker docks owned and operated by Seaway in Freeport Harbor offer excellent fill and withdrawal facilities for the Bryan Mound site (see Figure 2).

Freeport Sulphur, a Division of Freeport Minerals, owned the dome prior to FEA acquisition but had leased 150 acres to Dow Chemical to produce brine for chemical facilities. The existing caverns are located in the previously Freeport-owned, Dow-leased lands. The former owners of the site and of the planned crude oil pipeline easements are shown in Table 2. FEA acquired the Bryan Mound site on April 27, 1977, and took possession on May 16, 1977.

FEA will construct a 4.1-mile pipeline from Bryan Mound to Seaway's Jones Creek tank farm and 4.0-mile pipeline from the site to the Seaway docks. For fill, tankers would be off-loaded at the Seaway docks at Freeport, Texas, at a rate of up to 600,000 barrels per day. The oil would then be transported to Bryan Mound through the new 4-mile pipeline. A portion of this oil will be injected directly into caverns while the remainder will proceed to Seaway's tank farm through the bi-directional, 4.1-mile pipeline. When tanker off-loading is complete, fill will continue as oil is transported back to Bryan Mound from the tank farm. Fill could also take place by transporting oil directly to the tank farm through Seaway's existing pipeline and then to Bryan Mound through the new 4.1-mile pipeline. Seaway's existing pipeline and tanker terminal facilities could support an average withdrawal rate of up to 700,000 barrels per day; the 150-day drawdown rate is 420,000 barrels per day for the existing 63 MMB capacity at Bryan Mound.

FIGURE 2



## Facilities

The major on-site facilities needed at Bryan Mound are new cavern wells, a brine disposal system, and a water supply/injection system. Five new cavern wells may be required to support the design flow rates.

Brine, which is produced during cavern fill, can be disposed of by (1) transporting it via a new FEA pipeline to the Gulf of Mexico; (2) delivering it to local industrial users at a rate of up to 150,000 barrels per day; and/or (3) injecting it into the ground by brine disposal wells. Of these three possible disposal methods, disposal to the Gulf of Mexico is the primary method planned for Bryan Mound although FEA will make brine available to local industry as the need arises. Initial fill of the site will be accomplished by delivering brine to industrial users.

The water supply-injection system will inject raw water from (1) the Brazos River diversion channel; (2) the Gulf of Mexico; and/or (3) the Brazoria and Harris reservoirs (located 15 and 25 miles, respectively, from the site) into the caverns, to force oil out during the withdrawal phase.

TABLE 2

INDIVIDUALS WITH PROPERTY INTERESTS AT THE  
BRYAN MOUND STORAGE SITE

(Names and Addresses of Individuals with Ownership and  
Other Property Interests Prior to FEA Acquisition)

Freeport Minerals Company  
P. O. Box 61520  
New Orleans, Louisiana 70161

Dow Chemical U.S.A.  
Texas Division  
Freeport, Texas 77541

Velasco Drainage District  
P.O. Box 195  
Lake Jackson, Texas 77566

Everett B. Lewis, et. al.  
(Address Unknown)

Phillips Petroleum Company  
Bartlesville, Oklahoma

Nannie Stringfellow Estate, et. al.  
(Address Unknown)

R.E.L. Stringfellow Estate  
(Address Unknown)

Daisy B. Lewis Estate  
(Address Unknown)

## WEST HACKBERRY SALT DOME

The West Hackberry salt dome is located in north central Cameron Parish, Louisiana, 20 miles southwest of the city of Lake Charles. The dome lies approximately 16 miles north of the Gulf of Mexico and 4 miles south of the Intracoastal Waterway (see Figure 3).

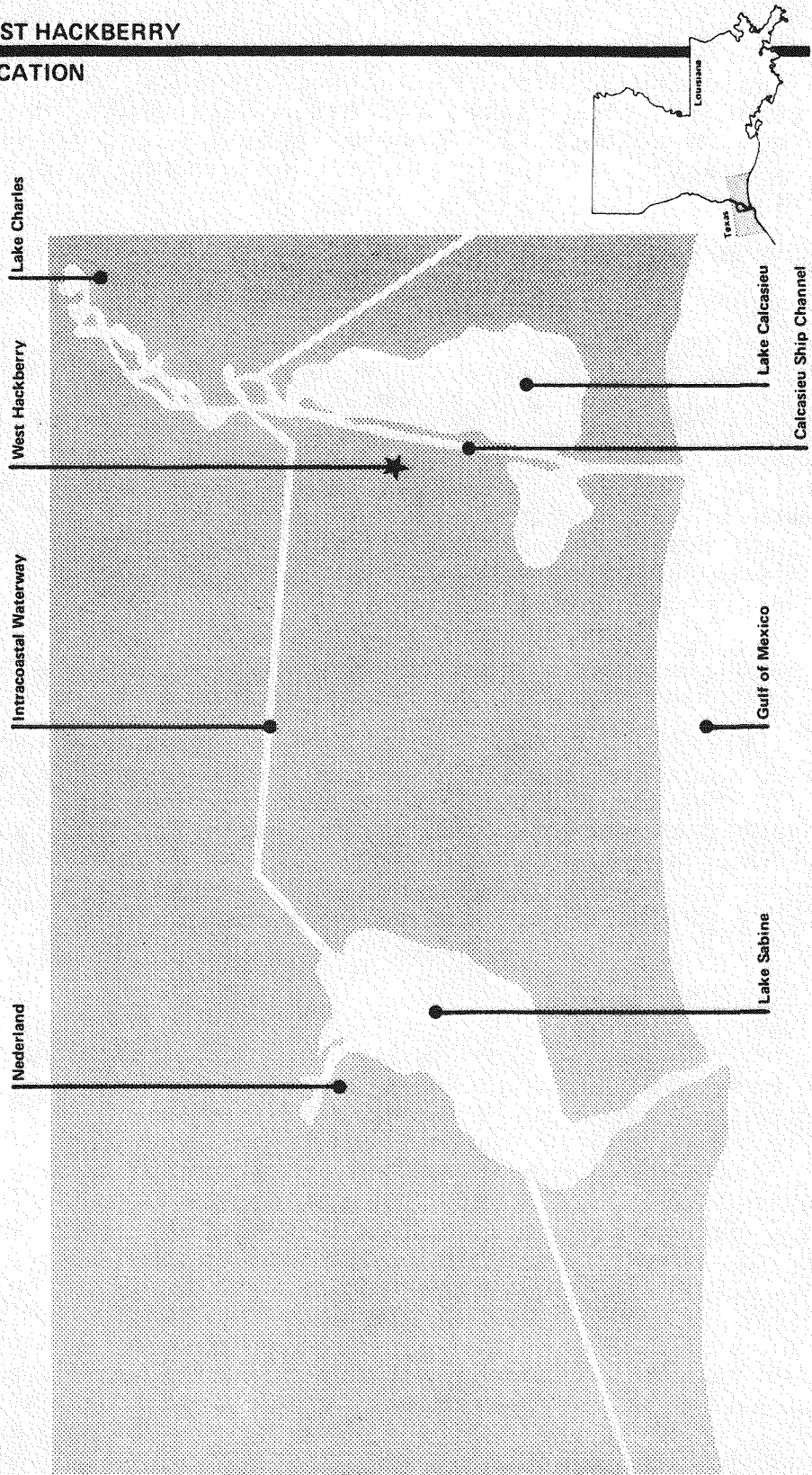
Of the 16 leached caverns that have been created and developed, 4 are unacceptable for storage, and 7, on the middle portion of the dome, are used for LPG storage and would be unavailable for crude oil storage. The remaining 5 caverns are used to produce brine for chemical facilities and are planned to be used for strategic storage. The usable volume of storage of these 5 caverns totals approximately 61 MMB.

Surface ownership of the dome prior to FEA acquisition was split among many parties (see Table 3). The 7 committed caverns were leased to Cities Service Oil Company and used for hydrocarbon product storage. Olin Corporation had leased rights to the salt in the other 5 caverns and had also obtained storage rights for the caverns on leased acreage after brining is completed. Olin produced specification brine for use in chemical operations at the rate of approximately 26,000 barrels per day. FEA acquired and took possession of the West Hackberry site on April 18, 1977.

The initial fill of West Hackberry will be accomplished by barging to the existing AMOCO barge docks in the Alkali Ditch near the site. A short pipeline from the docks to the site will be constructed in order to initially fill the site at a rate of between 30,000 and 50,000 barrels per day depending on the rate of brine disposal. Barges will be loaded at existing crude oil barge/tanker terminal facilities in the Calcasieu Channel or in the Nederland, Texas port area. Although this interim fill system could be used for withdrawal, its operating costs and limited withdrawal capability make the pipeline options described below attractive.

FIGURE 3

WEST HACKBERRY  
LOCATION



There are two oil distribution alternatives presently under evaluation by FEA for West Hackberry. Unlike the interim barge fill system, each of these pipeline alternatives would permit the fill of the site by the end of 1978 and total drawdown of the site could be accomplished in 150 days.

Option 1: Sun Oil Company's Tanker Docks and Related Facilities at Nederland and New 41-Mile FEA Pipeline

For fill, tankers would be off-loaded at tanker docks at the Sun Terminal in Nederland, Texas, at an average rate of up to 240,000 barrels per day. The oil would then be transported to West Hackberry through a new 41-mile FEA pipeline. Existing facilities at or near Nederland (Sun Terminal, Texoma Pipeline, and local refineries) would support a withdrawal rate of up to 1,475,000 barrels per day; the 150-day drawdown rate is 400,000 barrels per day for the 61 MMB existing capacity.

Option 2: Two New Tanker Docks on the Calcasieu Channel and New 5-Mile FEA Pipeline

For fill, tankers would be off-loaded at two new tanker docks on the Calcasieu Ship Channel at a rate of up to 360,000 barrels per day. The oil would then be shipped to West Hackberry through a new 5-mile FEA pipeline. The new docks and associated facilities will be designed to support an average withdrawal rate of up to 400,000 barrels per day, which is the 150-day drawdown rate.

Facilities

The major on-site facilities needed at West Hackberry are cavern wells, a brine disposal system, oil injection system and water supply/injection system.

Five new cavern wells may be required to support the design flow rates. Brine, which is produced during cavern fill, can be disposed of by (1) transporting it via a new FEA pipeline to the Gulf of Mexico (approximately 15 miles); (2) delivering it to local industrial users at an average rate of up to 26,000 barrels per day; and/or (3) injecting it into the ground through brine injection wells. Of these three possible disposal methods, disposal via brine injection wells is the primary method planned for West Hackberry

although FEA will make brine available to local industry as the need arises. Brine disposal for initial fill will be accomplished by means of a test brine disposal well planned for the site.

The water supply/injection system will inject raw water from Black Lake, which is adjacent to the site, into the caverns to force oil out during the withdrawal phase.

TABLE 3

INDIVIDUALS WITH PROPERTY INTERESTS AT THE  
WEST HACKBERRY STORAGE SITE

(Names and Addresses of Individuals with Ownership and  
Other Property Interests Prior to FEA Acquisition)

Maggie Ledoux Hebert (Widow)  
A/K/A Maggie Hebert  
MRH Box 199  
Hackberry, La. 70645

Curtis Portie et ux Lena Portie  
John & Curtis Portie Garage  
Cameron, La. 70631

John Edward Portie et ux Glynn Portie  
John & Curtis Portie Garage  
Cameron, La. 70631

Garlin N. Hebert  
A/K/A Garlin V. Hebert  
3206 Common Street  
Lake Charles, La. 70601

Marlin D. Hebert et ux Odel Hebert  
Rt. 2, Box 559  
Sulphur, La. 70663

Hester Hebert Sanner (Widow)  
A/K/A Hester Sanner  
1520 Ruth Street  
Sulphur, La. 70663

Florence Hebert Roberts et vir Aubrey Roberts  
A/K/A Florence Derouen Roberts  
A/K/A Florence Derouen  
224 East 3rd Street  
Iowa, La. 70647

Ruth Derouen et vir Jimmy Derouen  
Hwy. 82  
Cameron, La. 70631

Cheryl Ann Derouen  
A/K/A Cheryl Ann Derouen Richard  
1715 20th Street  
Lake Charles, La. 70601

Thomas D. Derouen (Single)  
A/K/A Thomas Dale Derouen  
A/K/A Thomas L. Derouen  
1715 20th Street  
Lake Charles, La. 70601

Cynthia Marie Derouen (Minor)  
1715 20th Street  
Lake Charles, La. 70601

Debra Kay Derouen (Minor)  
1715 20th Street  
Lake Charles, La. 70601

Sidonie Lacy Young (Widow)  
A/K/A Sidonie Lacy  
A/K/A Sidonie Lacy Ellender  
c/o Maude Lacy Ellender  
Rt. 2, Box 530  
Sulphur, La. 70663

Maude Lacy Ellender (Widow)  
A/K/A Maude Ellender  
Rt. 2, Box 530  
Sulphur, La. 70663

Willis Duhon et ux Pearl Duhon  
1510 Louis Lane  
Sulphur, La. 70663

Ernie B. Duhon divorced from Rose Duhon  
A/K/A Ernie Duhon  
Hwy. 90  
Sulphur, La. 70663

Herman J. Ellender  
A/K/A Herman Ellender  
Rt. 1, Box 105  
DeQuincy, La. 70633

Leslie Hebert et ux Allie Hebert  
Rt. 2, Hebert's Bar  
Lake Charles, La. 70605

Dupre Hebert, Jr. et ux Nada Hebert  
MRH Box 255  
Hackberry, La. 70645

August John Hebert et ux Shirley Hebert  
MRH Box 270-B  
Hackberry, La. 70645

Linda Lou Hebert et vir Edward Hebert  
Hebert Service Station  
Holly Beach, La.

Lester Joseph Hebert  
409 Hennings Drive  
Sulphur, La. 70663

Earline Hebert Deason et vir William Deason  
Rt. 2 (Carlyss)  
Sulphur, La. 70663

Cornelia Hebert Ledoux et vir Sam Ledoux  
A/K/A Cornelia Hebert Ledoux  
A/K/A Cornelia Ledoux a/k/a Cornelia Ledoux  
Rt. 1, Sweet Lake Route  
Bell City, Louisiana 70630

TABLE 3  
(Continued)

Odelia Hebert Trahan (Widow)  
A/K/A Odelia Trahan  
Rt. 2  
Sweet Lake, La. 70605

Edward Hebert et ux Linda Lou Hebert  
Hebert Service Station  
Holly Beach, La.

Ezra Hebert (Widower)  
Box 508 Hebert Road  
Lake Charles, La. 70601

Inez Hebert Blanchard  
A/K/A Inez Blanchard  
4 miles north of Dry Creek Service Station  
Dry Creek, La. 70637

Lavonia Sanner (Widow)  
A/K/A Lavonia Sonner  
1510 Louis Lane  
Sulphur, La. 70663

Lucy Peveto (Widow)  
A/K/A Lucy Pevito  
2501 Mary Street  
Lake Charles, La. 70631

Allie Nobles et vir Charles Nobles  
MRH Box 4  
Hackberry, La. 70645

Unknown heirs and legatees of  
Elma Gross  
A/K/A Elma Gros  
(Address Unknown)

Elma Gros Estate  
A/K/A Elma Gross Estate  
c/o Mrs. William C. Phillips  
1601 Whispering Woods Drive  
Lake Charles, La. 70631

Elma Marie Gross Moore et vir Jack Moore  
823 Bellemeade Blvd.  
Gretna, La. 70053

Avis Newman et vir William Newman  
MRH Box 27  
Hackberry, La. 70645

Elma Gros  
A/K/A Elma Gross  
(Address Unknown)

Pearl Shindelbower  
Star Route  
Georgetowne, CA 95634

Glenn Ellender  
A/K/A Glen Ellender  
(Address Unknown)

Glenn Ellender Estate  
A/K/A Glen Ellender Estate  
c/o Mrs. Glen Ellender  
Rt. 2, Box 626  
Sulphur, La. 70663

Unknown heirs and legatees of  
Glen Ellender  
(Address Unknown)

Unknown heirs and legatees of  
Vine Ellender  
(Address Unknown)

Mrs. Glen Ellender (Widow)  
Rt. 2, Box 626  
Sulphur, La. 70663

Hassel Ellender  
Rt. 3, Box 76 A  
Rockdale, Texas 76567

Lorraine Cormier (widow)  
A/K/A Lorraine Ellender Cormier  
325 Cypress Street  
Sulphur, La. 70663

Vine Ellender  
(Address Unknown)

Herman J. Ellender  
A/K/A Herman Ellender  
Rt 1, Box 105  
DeQuincy, La. 70633

Wallace Ellender  
Rt. 1, Box 110  
DeQuincy, La. 70633

Junius V. Hebert  
307 N. Crocker  
Sulphur, La. 70663

Isaac Hebert  
718 Miller Street  
Sulphur, La. 70663

Dorothy Mouton et vir Francis Mouton  
A/K/A Dorothy Dees  
811 Cary Ave.  
Jennings, La. 70546

Carl Dees  
Trailer Court off Hwy. 90  
Jennings, La. 70546

TABLE 3  
(Continued)

George L. Dees  
Harlington, Texas 78550

Cameron Parish  
Cameron Parish Police Jury  
Cameron Courthouse  
Cameron, La. 70631

Claude Eagleson  
Cameron Parish Tax Collector  
Cameron Courthouse  
Cameron, La. 70631

Shirley McNamara  
Louisiana State Revenue Collector  
Louisiana State Capitol Annex  
Baton Rouge, La. 70804

Edamae Vinson  
(Address Unknown)

Dorothy Overman  
(Address Unknown)

Secretary of the Department of Transportation  
and Development, Office of Highways  
Department of Transportation and Development  
Office of Highways  
F/K/A Louisiana Department of Highways  
1201 Capitol Access Road  
Baton Rouge, La. 70804

Malcolm Derouen  
(Address Unknown)

Unknown heirs or legatees of Malcolm Derouen  
(Address Unknown)

Unknown heirs or legatees of Malcolm Keith Derouen  
(Address Unknown)

Bernard Duhon  
(Address Unknown)

Unknown heirs or legatees of Bernard Duhon  
(Address Unknown)

Levonie Lacy Duhon, widow of Bernard Duhon  
A/K/A Levonie Duhon (Address Unknown)

Unknown heirs or legatees of Lillian Ellender  
(Address Unknown)

Lillian Lacy Ellender  
A/K/A Lillian Ellender  
(Address Unknown)

Unknown heirs or legatees of Lillian Lacy Ellender  
(Address Unknown)

Armogen Hebert  
(Address Unknown)

Unknown heirs or legatees of Armogen Hebert  
(Address Unknown)

Charles F. Hebert  
(Address Unknown)

Drozan Hebert  
(Address Unknown)

Unknown heirs or legatees of Drozan Hebert  
(Address Unknown)

John Hebert  
A/K/A John D. Hebert  
(Address Unknown)

Unknown heirs or legatees of  
John B. Hebert and his wife,  
Christine Ellender Hebert  
(Address Unknown)

Unknown heirs or legatees of John D. Hebert  
(Address Unknown)

Unknown heirs or legatees of John V. Hebert  
(Address Unknown)

John B. Hebert  
(Address Unknown)

John V. Hebert  
(Address Unknown)

Narcisse Hebert  
(Address Unknown)

Unknown heirs or legatees of Narcisse Hebert  
(Address Unknown)

Adelia Lacy  
(Address Unknown)

Arise Hebert Portie  
A/K/A Arise H. Portie  
(Address Unknown)

Unknown heirs or legatees of Arise H. Portie  
(Address Unknown)

Dupre Hebert  
(Address Unknown)

Unknown heirs or legatees of Dupre Hebert  
(Address Unknown)

TABLE 3  
(Continued)

J. C. Elender  
(Address unknown)

J. Clerfa Elender  
(Address unknown)

Edamae Vinson  
(Address unknown)

Dorothy Overman  
(Address unknown)

The Calcasieu Marine National Bank, Main Branch  
Trustee of Eva Elender Crabb Trust  
844 Ryan Street  
Lake Charles, La. 70601

Edith Burton Plauche  
1401 Shell Beach Drive  
Lake Charles, Louisiana 70663

Estate of Evelyn Burton Lawton  
Linda Lawton Drost - Executrix  
Evelyn Gay Duhon - Executrix  
Jack E. Lawton, Jr. - Executor  
c/o Mr. Mitch Drost  
101 N. Hunington Street  
Sulphur, La. 70663

William Burton Lawton  
Rt. 2, Box 816  
Sulphur, La. 70663

Jack Edward Lawton, Sr.  
Rt. 2, Box 816  
Sulphur, La. 70663

Evelyn Shaddock Woosley  
1501 Shell Beach Drive  
Lake Charles, La. 70601

William Edward Shaddock, Jr.  
1301 Shell Beach Drive  
Lake Charles, La. 70601

William T. Burton Industries, Inc.  
Resident Agent for Service of Process:  
John C. Camp  
901 Lakeshore Drive  
Lake Charles, La. 70601

The Calcasieu Marine National Bank, Main Branch  
Trustee of "The Stephen Gorman Shaddock Trust"  
844 Ryan Street  
Lake Charles, La. 70601

The Calcasieu Marine National Bank, Main Branch  
Trustee of "The Mary Craig Shaddock Trust"  
844 Ryan Street  
Lake Charles, La. 70601

Elton Ray Hebert  
(Address Unknown)

Unknown heirs or legatees of Elton Ray Hebert  
(Address Unknown)

Asa Ellender  
(Address Unknown)

Unknown heirs or legatees of Asa Ellender  
(Address Unknown)

The Calcasieu Marine National Bank, Main Branch  
Trustee for "The Nancy Edith Shaddock Trust"  
844 Ryan Street  
Lake Charles, La. 70601

Ernest I. Hamilton, Sr.  
a/k/a Ernest Hamilton a/k/a Ernest J. Hamilton  
a/k/a Ernest Hamilton, Sr., et ux  
Mary Elm Elender Hamilton a/k/a Mary Elender Hamilton  
a/k/a Mary Hamilton a/k/a Mary E. Hamilton  
Hackberry, La. 70645

Eva Crabb Elender a/k/a Eva Elender Crabb  
a/k/a Eva Crabb  
a/k/a Eva Ellender Crabb, Usufructuary  
Naked owners: Ernest I. Hamilton, Sr.,  
mortgage holder of Mary Elm Elender Hamilton  
and Agnes Elender Lowery Mortgage  
6809 Avenue "H"  
Houston, Texas 77001

Olin Corporation  
f/k/a Olin Mathieson Chemical Corporation  
f/k/a Olin Mathieson  
f/k/a Mathieson Alkali Works, Inc.,  
Resident Agent for Service of Process:  
CT Corporation  
1300 Hibernia Bank Building  
New Orleans, La. 70112

Eugene A. Hults  
(Address unknown)

Valley Gas Transmission, Inc.  
Resident Agent for Service of Process:  
CT Corporation System  
1300 Hibernia Bank Building  
New Orleans, La. 70112

Clara N. Elender  
(Address unknown)

Guy Elender  
(Address unknown)

Amoco Production Company  
Resident Agent for Service of Process  
C. T. Corporation  
1300 Hibernia Building  
New Orleans, Louisiana 70112

William T. Burton  
(Address Unknown)

All heirs or legatees known or unknown of  
William T. Burton  
(Address unknown)

TABLE 3  
(Continued)

Agnes Elender Lowrey (Widow)  
a/k/a Agnes Elender Lowrey  
605 Chennault St.  
Sulphur, La. 70645

Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lowrey, Jr.  
a/k/a Ernest Lowrey, Jr. et ux Ammye Reeds Lowrey  
2333 Barbe St.  
Lake Charles, La. 70601

Lauris Earl Lowrey  
a/k/a Lauris Earl Lowrey et ux Janice Lowrey  
506 Chennault St.  
Sulphur, La. 70645

Mary Geraldine Lowrey Cirillo  
a/k/a Mary Geraldine Lowrey Cirillo  
a/k/a Mary Geraldine Cirillo et vir Anthony Cirillo  
2436 San Francisco Drive  
Newport Beach, Ca. 92660

Agnes Elender Lowrey Trust  
a/k/a Agnes Elender Trust

Beneficiaries:

Clerfa John Lowrey a/k/a Clefra John Lowrey  
a/k/a Clefra John Lowrey  
Lorraine Lowrey a/k/a Lorraine Lowrey  
Arthur Lee Lowrey a/k/a Arthur Lee Lowrey  
Doris Marie Lowrey Vinson a/k/a Doris Marie Lowrey  
a/k/a Doris Marie Lowrey  
Leo Lawrence Lowrey a/k/a Leo Lawrence Lowrey  
Peggy Ruth Lowrey a/k/a Peggy Ruth Lowrey  
a/k/a Peggy Ruth Lowrey Steine  
a/k/a Peggy Ruth Lowrey Steine  
John Anthony Lowrey a/k/a John Anthony Lowrey  
a/k/a John Anthonu Lowrey

Trustees:

Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601  
Lauris Earl Lowrey a/k/a Lauris Earl Lowrey  
506 Chennault St.  
Sulphur, La. 70645  
Mary Geraldine Lowrey Cirillo  
a/k/a Mary Geraldine Cirillo  
2436 Francisco Drive  
Newport Beach, Ca. 92660

Clerfa John Lowrey a/k/a Clerfa John Lowrey  
a/k/a Clefra John Lowrey a/k/a Clefra John Lowrey  
et ux Donna Lowrey  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

Arthur Lee Lowrey a/k/a Arthur Lee Lowrey,  
separated from Betty Lowrey  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

Leo Lawrence Lowrey a/k/a Leo Lawrence Lowrey  
et ux Joyce Lowrey  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

John Anthony Lowrey a/k/a John Anthonu Lowrey  
a/k/a John Anthonu Lowrey  
a/k/a John Anthony Lowrey et ux Velma Lowrey  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

Doris Marie Lowrey Vinson  
a/k/a Doris Marie Lowrey Vinson  
a/k/a Doris Marie Lowrey a/k/a Doris Marie Lowrey,  
divorced from Leonard Vinson  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

Lorraine Lowrey Wood a/k/a Lorraine Lowrey Wood  
a/k/a Lorraine Lowrey a/k/a Lorraine Lowrey et vir  
Marshall Wood  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

Peggy Ruth Lowrey a/k/a Peggy Ruth Lowrey  
a/k/a Peggy Ruth Lowrey Steine  
a/k/a Peggy Ruth Lowrey Steine  
a/k/a Peggy Ruth Lowrey Stine  
a/k/a Peggy Ruth Lowrey Stine et vir Marvin Stine  
c/o Ernest Lawrence Lowrey, Jr.  
a/k/a Ernest Lawrence Lowrey, Jr.  
2333 Barbe St.  
Lake Charles, La. 70601

TABLE 3  
(Concluded)

The Ernest and Mary Hamilton Daughter Trust  
Beneficiaries:

Polly Ann Hamilton Tendrow  
Christine Marie Powers  
Elizabeth Theresa Powers  
William Ernest Powers  
Ernest I. Hamilton, Jr.,  
a/k/a Ernest J. Hamilton, Jr., Trustee  
828 Wylie Drive  
Baton Rouge, La. 70808  
Michael Cavanaugh  
a/k/a Michael J. Cavanaugh, Trustee  
602 Europe St.  
Baton Rouge, La. 70808

Polly Ann Hamilton Tendrow et vir Ted Tendrow  
c/o Ernest I. Hamilton, Jr.  
a/k/a Ernest J. Hamilton, Jr.  
828 Wylie Drive  
Baton Rouge, La. 70808

Christine Marie Powers (single)  
c/o Ernest I. Hamilton, Jr.  
a/k/a Ernest J. Hamilton, Jr.  
828 Wylie Drive  
Baton Rouge, La. 70808

Elizabeth Theresa Powers (single)  
c/o Ernest I. Hamilton, Jr.  
a/k/a Ernest J. Hamilton, Jr.  
828 Wylie Drive  
Baton Rouge, La. 70808

William Ernest Powers (single)  
c/o Ernest I. Hamilton, Jr.  
a/k/a Ernest J. Hamilton, Jr.  
828 Wylie Drive  
Baton Rouge, La. 70808

Ernest I. Hamilton, Jr.  
a/k/a Ernest J. Hamilton, Jr., et ux  
Diane Singleton Hamilton  
828 Wylie Drive  
Baton Rouge, La. 70808

Diane Hamilton a/k/a Diane Singleton Hamilton  
a/k/a Doris Singleton Hamilton et vir  
Ernest I. Hamilton, Jr.  
828 Wylie Drive  
Baton Rouge, La. 70808

Ernest I. Hamilton, Sr.  
Trustee for Diane Singleton Hamilton revocable Trust  
a/k/a Doris Singleton Hamilton revocable Trust  
Hackberry, La. 70645

## WEEKS ISLAND MINE

Weeks Island is an operating salt mine, located south of New Iberia, Louisiana, on the Gulf Coast, and abutted by the Intracoastal Waterway (see Figure 4). Mining operations are conducted only on the lower level of the two level mine. The mine contains sufficient space to store approximately 38 MMB in the upper level and 51 MMB in the lower, for a total of 89 MMB of oil.

The Morton Salt Company employs 200 to 400 people and holds ownership and storage rights to Weeks Island (Table 4). Morton has indicated no plans to terminate mining operations at Weeks Island since space is available for Morton to develop a new mine. FEA plans to allow the Morton Salt Company to begin developing a new salt mine at Weeks Island prior to the time FEA takes full possession of the existing mine. The understanding between FEA and Morton is that it is feasible for present salt mining operations to be conducted simultaneously with development of a new mine at the site. The new mine could be accessed initially from the existing mine through a new drift tunnel between the mines to accelerate development. Once the new shaft is fully established, the drift tunnel would be closed off with redundant seals, and instrumentation put in place. Other necessary alterations would be made at that time to the existing mine to prepare for the storage of oil, while the new mine preparation would take place through the new shaft.

### Distribution

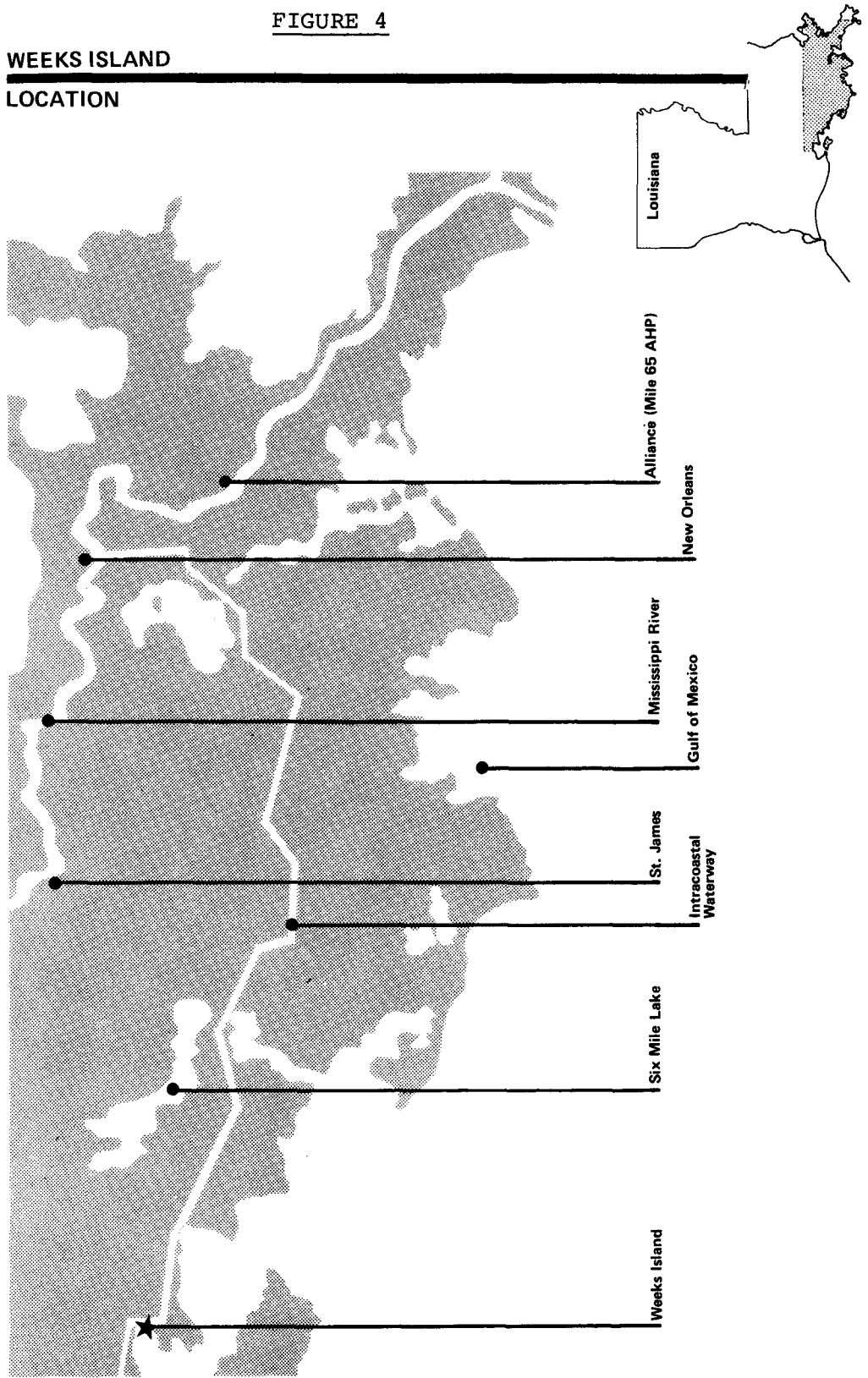
There are two distribution options for Weeks Island.

#### Option 1: Barge Docks at the Weeks Island Site

For fill, barges would be loaded directly from tankers temporarily anchored near Alliance, Louisiana, along the Mississippi River, towed through the Intracoastal Waterway to the site, discharged at one of six reserve barge docks (four Morton docks now exist), and then returned to the temporary anchorage for another load. If the temporary

FIGURE 4

WEEKS ISLAND  
LOCATION



anchorage is impractical, barges could load at existing tanker-barge terminals along the Mississippi River or possibly in Lake Charles. The maximum fill rate would be 105,000 barrels per day, within the constraints of barge availability.

For withdrawal, barges would be loaded at the barge docks along the Intracoastal Waterway and towed to nearby barge terminals on the Mississippi River or in Lake Charles. The Reserve oil would be delivered to nearby refineries or transported by tanker or pipeline at a maximum rate of 345,000 barrels per day.

Option 2: New or Existing Tanker Docks at St. James and New 60-Mile FEA Pipeline

For fill, tankers would be off-loaded at new or existing tanker docks in St. James, Louisiana, at an average rate of up to 240,000 barrels per day. The oil would then be transported to Weeks Island through a new 60-mile FEA pipeline to the Weeks Island site. The 150-day drawdown rate through the new FEA pipeline would be an average 593,000 barrels per day.

Facilities

The major on-site facilities at Weeks Island, all related to mine conversion for storage purposes, include development of a shaft for the oil fill and withdrawal pumps and casing, as well as piping and other modifications and improvements within the mine (e.g., creation of drainage channels, waste removal).

Of the two existing shafts, the 10-foot diameter service shaft will be modified to house the various casings required. The existing 18-foot diameter production shaft could be used as the pump shaft, but continued use of the mine by Morton for salt production during mine conversion precludes its use. If, because of scheduling or technical factors, the existing shafts are not used as the pump shaft, a new 12-foot diameter shaft would have to be sunk.

TABLE 4

INDIVIDUALS WITH PROPERTY INTERESTS AT THE  
WEEKS ISLAND STORAGE SITE

(Names and Addresses of Individuals with Ownership and  
Other Property Interests)

Morton Salt Company  
110 Wacker Drive  
Chicago, Illinois 60606