U.S. DEPARTMENT OF ENERGY

Strategic Petroleum Reserve Annual Report for Calendar Year 2014

Report to Congress
December 2016

United States Department of Energy
Washington, D.C. 20585

Message from the Assistant Secretary of Fossil Energy

The Secretary of Energy is required[1] to report annually to the President and the Congress on the activities of the Strategic Petroleum Reserve (SPR). Highlights of the Department's accomplishments are included in the Executive Summary of this report, the *Strategic Petroleum Reserve Annual Report for Calendar Year 2014*.

Also included in this report are details concerning the physical capacity, type, and quantity of petroleum in the SPR, as well as plans for upgrades and major maintenance. The Energy Policy and Conservation Act requires information on the current withdrawal and distribution rates and capabilities, the history and costs of petroleum acquisitions, and the costs associated with operations, maintenance, management, and planned projects for the SPR.

This report is being provided to the President and the following members of Congress:

- **The Honorable Joseph R. Biden, Jr.**
  President of the Senate

- **The Honorable Paul Ryan**
  Speaker of the House of Representatives

- **The Honorable Thad Cochran**
  Chairman, Senate Committee on Appropriations

- **The Honorable Barbara A. Mikulski**
  Vice-Chairwoman, Senate Committee on Appropriations

- **The Honorable Michael B. Enzi**
  Chairman, Senate Committee on Budget

- **The Honorable Bernard Sanders**
  Ranking Member, Senate Committee on Budget

- **The Honorable Lamar Alexander**
  Chairman, Subcommittee on Energy and Water Development
  Senate Committee on Appropriations

[1] Section 165 of the Energy Policy and Conservation Act (42 U.S.C. 6245), as amended

- **The Honorable Dianne Feinstein**
  Ranking Member, Subcommittee on Energy and Water Development
  Senate Committee on Appropriations

- **The Honorable Lisa Murkowski**
  Chairwoman, Senate Committee on Energy and Natural Resources

- **The Honorable Maria Cantwell**
  Ranking Member, Senate Committee on Energy and Natural Resources

- **The Honorable Harold Rogers**
  Chairman, House Committee on Appropriations

- **The Honorable Nita M. Lowey**
  Ranking Member, House Committee on Appropriations

- **The Honorable Mike Simpson**
  Chairman, Subcommittee on Energy and Water Development
  House Committee on Appropriations

- **The Honorable Marcy Kaptur**
  Ranking Member, Subcommittee on Energy and Water Development
  House Committee on Appropriations

- **The Honorable Tom Price**
  Chairman, House Committee on the Budget

- **The Honorable Chris Van Hollen**
  Ranking Member, House Committee on the Budget

- **The Honorable Fred Upton**
  Chairman, House Committee on Energy and Commerce

- **The Honorable Frank Pallone, Jr.**
  Ranking Member, House Committee on Energy and Commerce

- **The Honorable Edward Whitfield**
  Chairman, Subcommittee on Energy and Power
  House Committee on Energy and Commerce

- **The Honorable Bobby L. Rush**
  Ranking Member, Subcommittee on Energy and Power
  House Committee on Energy and Commerce

If you have any questions or need additional information, please contact me or Mr. Christopher King, Acting Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Christopher A. Smith

Executive Summary

Program Highlights and Status

The Strategic Petroleum Reserve (SPR) Program provides the United States with energy and economic security through its emergency stockpile of crude oil. The stocks are located at four facilities - Bryan Mound and Big Hill in Texas, and Bayou Choctaw and West Hackberry in Louisiana.

The SPR entered 2014 with 696 million barrels of crude oil, and as of December 31, 2014, the Reserve held 691 million barrels, equivalent to approximately 136 days of net U.S. petroleum imports. This number is based on dividing a 2014 SPR inventory of 690,959,000 barrels by 2014 average daily net imports of 5.065 million barrels per day as reported by EIA.

The Energy Policy and Conservation Act (EPCA) requires the Secretary of Energy to conduct a continuing evaluation of the SPR drawdown and sales procedures. In conducting an evaluation, "the Secretary is authorized to carry out a test drawdown and sale or exchange of petroleum products from the Reserve" under Section 161(g). Due to significant changes in domestic crude oil production, increased imports of Canadian crude oil, and changes to crude oil distribution infrastructure upon which the SPR relies, DOE determined that a test sale should be carried out to evaluate the drawdown and sales procedure capabilities of the Reserve in the TEXOMA distribution system, which has been most impacted by the changes.

On March 12, 2014, the Secretary authorized the test sale under Section 161(g) of EPCA. The statute limits test sales to a maximum of five million barrels, and this amount was authorized to ensure that all distribution mechanisms would be exercised. Section 161(g) also limits the price at which SPR crude may be sold to no less than 95 percent of the sales price, as estimated by the Secretary, of comparable crude being sold in the same area in the same timeframe.

The test sale was successful in evaluating the drawdown and sales procedures. The test sale, however, did not evaluate the ability of the SPR to distribute incremental oil to the market in the event of a disruption; DOE has recently recommended upgrading and modernizing the SPR to increase its effective distribution capacity in the event of an emergency. The SPR identified lessons learned in both operational and procedural areas related to the drawdown and sale of crude oil. The lessons learned have been documented, and corrective actions are being implemented to optimize the Reserve's operational effectiveness.

The Northeast Gasoline Supply Reserve (NGSR) was established in 2014 under the provisions of Section 154 of the Energy Policy and Conservation Act (42 U.S.C 6234), which authorizes the broader SPR. Prior to the development of the NGSR, the SPR consisted entirely of crude oil. The events of Superstorm Sandy in 2012 highlighted the need for a reserve of refined petroleum products to ease shortages that may result from such sudden and unexpected supply interruptions. The Department of Energy's Office of Petroleum Reserves (OPR) was directed to,

and subsequently established, a one million barrel petroleum product reserve consisting of regionally appropriate gasoline blend stock in the northeast U.S.

Changes to Performance Capabilities

Suspension of Vapor Pressure Mitigation Program

The use of deep underground solution-mined salt caverns for long-term storage of crude oil subjects the oil to geothermal heating and gas intrusion from the surrounding salt, which tends to increase the crude oil vapor pressure. During a drawdown, oil that is delivered to storage tanks at terminals may release toxic and flammable gases at levels that can present environmental and health risks to terminal personnel and the public. The SPR mitigates the risks posed by toxic and flammable gases through the use of a customized, portable degasification unit that reduces the crude oil vapor pressure in the caverns so that the crude oil can be delivered safely. The unit is moved among the SPR sites every 2-4 years, as necessary, to degas caverns that show high levels of vapor pressure.

In February 2011, the degas unit completed a two-year program at the Bryan Mound, Texas site and was scheduled to be transported to the West Hackberry, Louisiana site later in the year. However, due to a fiscal year 2011 continuing resolution rescission of $15.3 million in prior year funding, degassing activities were deferred pending availability of resources. In 2013, the plant began its move from Bryan Mound to West Hackberry; a transition that was completed in 2014.

Development of Replacement Cavern at Bayou Choctaw

Cavern 20 was emptied and decommissioned due to structural issues that would have presented a major environmental risk with continued use. Bayou Choctaw began transferring crude oil from Cavern 20 into Cavern 102 in January 2013.

A volume of approximately 3.2 million barrels of crude oil in Cavern 20 has been transferred into Cavern 102. Upon completion, Cavern 20 will be transitioned from a storage cavern to a monitored brine filled cavern.

Environment, Safety, and Health

SPR storage sites are recipients of several awards for management quality, environmental stewardship, and safety management systems. In 2014, the SPR received four awards from the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program (VPP) Region VI, along with four awards from DOE VPP, and two Star of Excellence Awards for Big Hill. All of these awards require the site to perform at least 50 percent better than their industry average accident rates.

STRATEGIC PETROLEUM RESERVE ANNUAL REPORT FOR CALENDAR YEAR 2014

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I. Legislative Language

The Strategic Petroleum Reserve (SPR) was authorized by the *Energy Policy and Conservation Act* (EPCA), as amended (42 U.S.C. 6201 *et seq*.), which was enacted on December 22, 1975 (Pub L. 94-163). The SPR has operated since that time in recognition of the long-term dependence of the U.S. on imported crude oil and petroleum products.

Section 165 of EPCA requires the Secretary of Energy to submit an Annual Report to the President and the Congress on the activities of the SPR. This *Strategic Petroleum Reserve Annual Report for Calendar Year 2014* includes information on:

- The status of the physical capacity of the SPR and the type and quantity of petroleum products stored;
- An estimate of the schedule and cost to complete planned equipment upgrades or capital investment in the SPR, including upgrades and investments carried out as part of operational maintenance or extension of life activities;
- Identification of any life-limiting conditions or operational problems at any SPR facility, and proposed remedial actions including an estimate of the schedule and cost of implementing those remedial actions;
- A description of current withdrawal and distribution rates and capabilities, and an identification of any operational or other limitations on those rates and capabilities;
- A listing of petroleum product acquisitions made in the preceding year and planned in the following year, including quantity, price, and type of petroleum;
- A summary of the actions taken to develop, operate, and maintain the SPR;
- A summary of the financial status and financial transactions of the SPR and the SPR Petroleum Accounts for the year;
- A summary of expenses for the year, and the number of Federal and contractor employees;
- The status of contracts for development, operation, maintenance, distribution, and other activities of the Strategic Petroleum Reserve;
- A summary of foreign oil storage agreements and their implementation status; and,
- Any recommendations for supplemental legislation or policy or operational changes the Secretary considers necessary to implement the requirements of EPCA.

II. Program Mission

Introduction

The SPR operates pursuant to the authority of the *Energy Policy and Conservation Act* (EPCA) (42 U.S.C. 6201 et seq.), as amended. EPCA was enacted in recognition of the long-term dependence of the U.S. on imported crude oil and petroleum products.

As of December 31, 2014, the SPR contained 691 million barrels of crude oil. That inventory provides the equivalent of about 136 days of net petroleum imports based on net U.S. imports of 5.065 million barrels per day (MMB/D). The U.S. relies on a combination of oil in the SPR and private stocks to meet its oil storage obligations under and consistent with the International Energy Program agreement made in 1974.

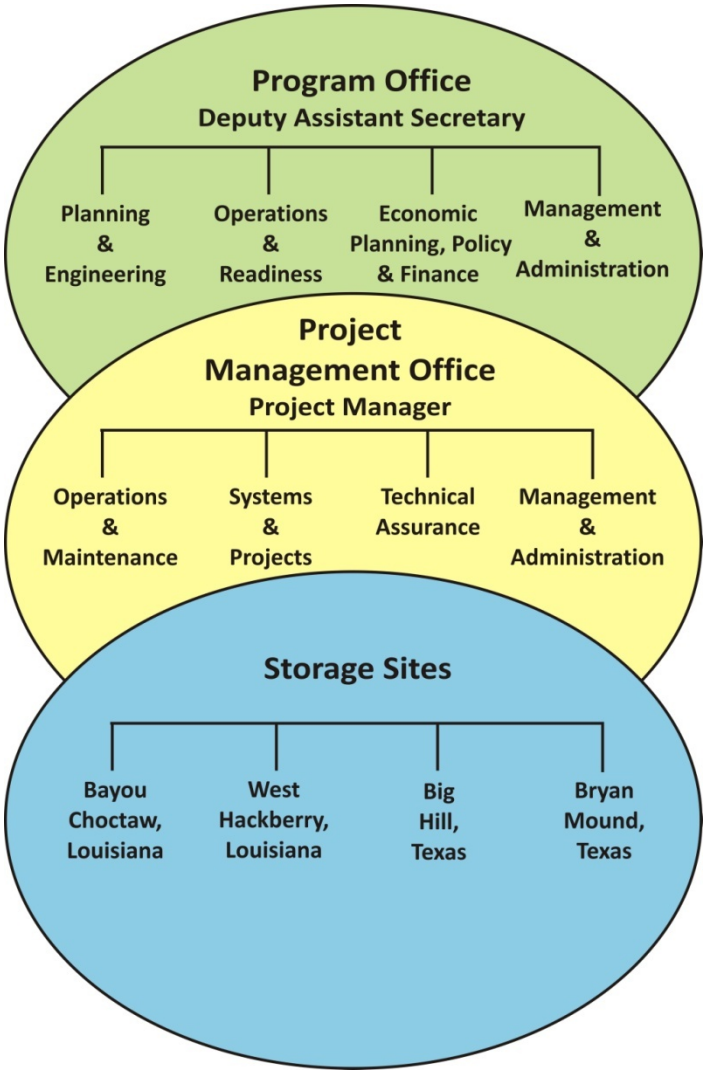
III. Program Management

Organization

The Assistant Secretary for Fossil Energy at DOE in Washington, DC, has overall program responsibility for achieving the goals and objectives of the SPR. This responsibility is delegated to the Deputy Assistant Secretary for Petroleum Reserves, and is exercised through the Program Office in Washington, DC, and the SPR Project Management Office (SPRPMO) in New Orleans, Louisiana. Program Office staffing is 22 Federal employees and 13 contractor employees, while SPRPMO staffing is 90 Federal employees and 526 contractor employees as of December 31, 2014. Figure 1 depicts the SPR organizational structure.

Figure 1

Strategic Petroleum Reserve Organizational Structure



Contractual Support

The Project Management Office is responsible for the design, development, operation and maintenance of the SPR. FLUOR Federal Petroleum Operations was awarded the follow-on Management and Operation Contract, to provide management and personnel to operate and maintain the SPR facilities and related systems. The period of performance is for five years, with five one-year options, which began on April 1, 2014.

Vali Cooper International, a service disabled veteran-owned small business architectural and engineering (A&E) firm, is under contract to provide design services for the four storage facilities. The period of performance is three years which commenced August 15, 2014.

Sandia National Laboratory provides geotechnical support that includes analysis of the salt dome, cavern integrity, vapor pressure, crude oil quality, and new cavern development.

Several support services contracts exist for management, technical, and computer support. The largest support service contractor in 2013 was Performance Excellence Partners, an 8(a) small and disadvantaged business that provided management and technical support. The contract is currently in option year one, through October 31, 2015, with one option year remaining.

Other support services contractors that support the Program Office in Washington, DC, include PB Energy Storage Services, Inc., AOC Petroleum Support Services, LLC, and Cyborg, Inc.

Electrical power is provided to the four storage facilities by local utilities GEXA Reliant and Entergy.

The SPR holds contracts with three commercial facilities that provide terminal services for fill, drawdown, and storage of crude oil. The contract with Sunoco Partners Marketing & Terminals, L.P. is in its final five-year option period that runs through 2018. Phillips 66 holds a five-year contract, formerly held with Unocal Corporation, which runs through September 2017. Seaway Crude Pipeline Company has a five-year contract that runs through December 12, 2016.

IV. Crude Oil Storage Program

Strategic Petroleum Reserve Storage Facilities

The SPR currently operates and maintains four major oil storage facilities in the Gulf Coast region of the U.S. All oil stored in the SPR's facilities is in large underground caverns that have been created in salt dome formations. Salt dome storage technology provides maximum security and safety for the Nation's stockpile of crude oil and is also the lowest cost technology for large-scale petroleum storage projects. The average operations cost for fiscal year 2014 was $0.239 per barrel for the management, staffing, operations and maintenance, and security. This cost is substantially less than industry storage costs and most foreign petroleum oil reserves.

The SPR has two sites in Texas (Bryan Mound and Big Hill), and two sites in Louisiana (West Hackberry and Bayou Choctaw). These four sites have a combined storage capacity of 727 million barrels and a maximum design drawdown capability of 4.415 MMB/D[2]. Table 1 shows the storage capacity and design drawdown capability of each site as of December 31, 2014.

The SPR's oil storage facilities are grouped into three geographical distribution systems in the Gulf Coast: Seaway, TEXOMA and Capline. Each system has access to one or more major refining centers, interstate crude oil pipelines, and marine terminals for crude oil distribution. The locations of the SPR storage sites, and their respective distribution systems, are shown in Figure 2.

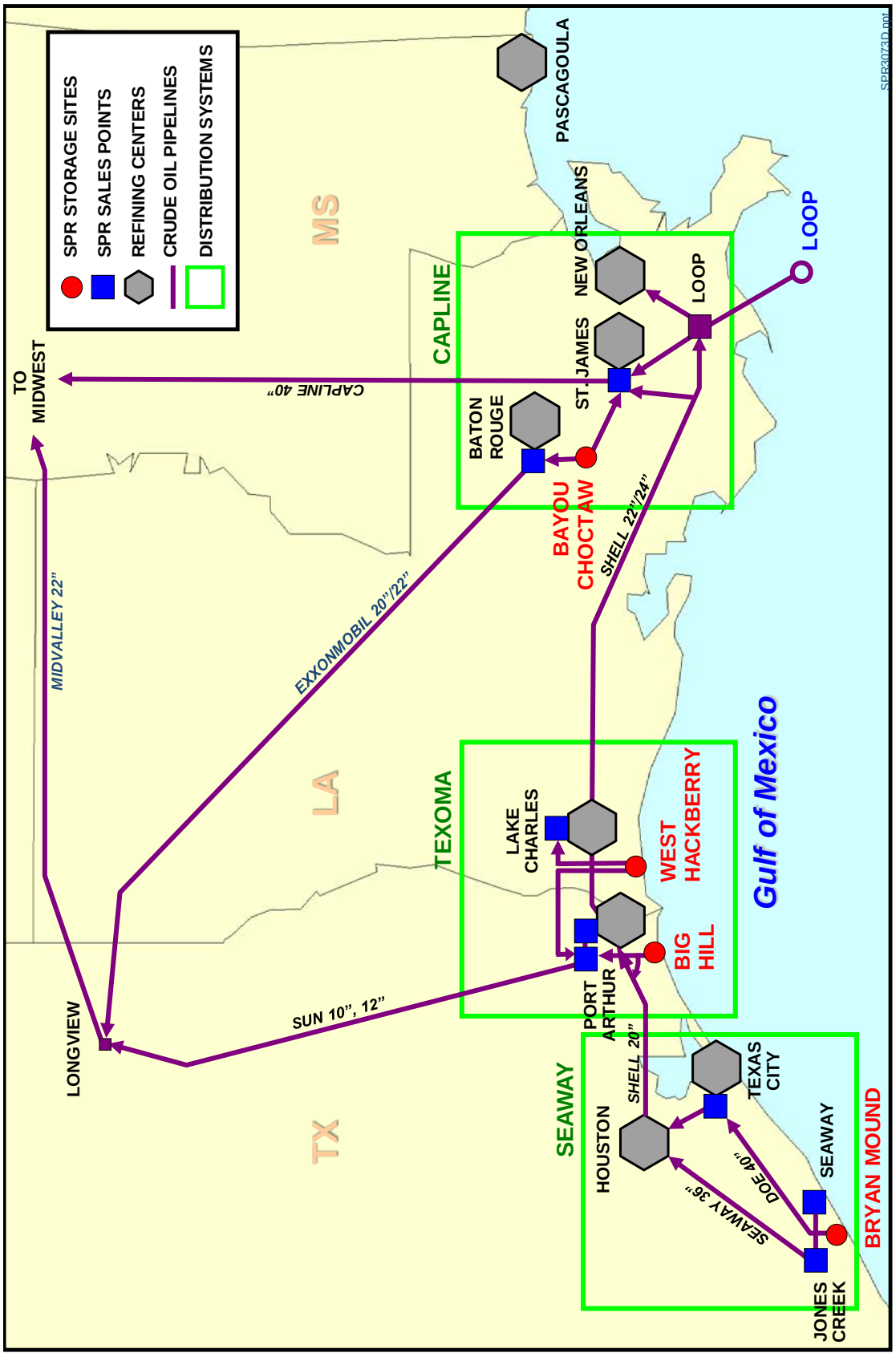
Table 1
Storage Capacity and Design Drawdown Capability
(As of December 31, 2014)

CURRENT SITE CAPABILITY			
Storage Facility	**Storage Capacity* (MMB)**	**Crude Mix Sweet/Sour (MMB)**	**Design Drawdown Capability (MMB/D)**
Bryan Mound	**254.0**	**78/176**	**1.5****
West Hackberry	**227.0**	**108/119**	**1.3**
Big Hill	**170.0**	**72/98**	**1.1**
Bayou Choctaw	**76.0**	**24/52**	**.515**
Total Program	**727.0**	**282/445 (39%/61%)**	**4.415**

Sweet = Sulfur content not exceeding 0.5 percent Sour = Sulfur content greater than 0.5 percent
MMB = Million Barrels MB/D = Thousand Barrels Per Day
* Storage Capacities reflect Temporary Deviation (VA-D9-054) to minimize oil storage risks in BC Cavern 20. (i.e. West Hackberry +1.5 MMB, Big Hill +1.0 MMB, Bayou Choctaw -2.5MMB).
** Current Bryan Mound maximum drawdown capability is reduced to 1.330 MMB/D due to needed repair.

[2]As of December 2014, drawdown capability has been reduced to 4.22 MMB/D due to required repairs in Tank 2 and Tank 4 at Bryan Mound.

Figure 2
Storage Sites and Distribution System



Cavern Maintenance

During 2014, a total of 14 well workovers were performed at the four SPR sites. This included five diagnostic workovers; six remediation workovers to install cemented protective steel liners inside the existing well-bores; and three brine string repair workovers. Two workover rigs were used to perform this work, including leased Pioneer Rig 8 and DOE Rig 155. A dedicated safety professional is assigned to each rig.

Bryan Mound Site Status

The Bryan Mound storage site is located in Brazoria County, Texas, approximately three miles southwest of Freeport, Texas. The site has 20 storage caverns with a total authorized storage capacity of 254.0 million barrels, and a cavern inventory of 240.8 million barrels.

The Bryan Mound site was completed in 1986. The SPR annually performs a number of major maintenance projects to maintain the site's operational capabilities. During 2014, the site drawdown rate was reduced by 150,000 barrels per day pending replacement of a damaged internal floating pan on a storage tank that is used during drawdown.

Big Hill Site Status

The Big Hill storage site is located in Jefferson County, Texas, approximately 26 miles southwest of Beaumont, Texas. The site has 14 storage caverns, a combined authorized storage capacity of 170.0 million barrels, and a cavern inventory of 162.4 million barrels.

The Big Hill site was completed in 1991. The SPR annually performs a number of major maintenance projects to maintain the site's operational capabilities.

West Hackberry Site Status

The West Hackberry storage site is located in Cameron Parish, Louisiana, approximately 25 miles southwest of Lake Charles, Louisiana. The site has 22 storage caverns with a combined authorized storage capacity of 227.0 million barrels, and a cavern inventory of 213.3 million barrels.

The West Hackberry site was completed in 1988. The SPR annually performs a number of major maintenance projects to maintain the site's operational capabilities.

Bayou Choctaw Site Status

The Bayou Choctaw storage site is located in Iberville Parish, Louisiana, approximately 12 miles southwest of Baton Rouge, Louisiana. The site has seven storage caverns, an authorized storage capacity of 76.0 million barrels, and a cavern inventory of 73.6 million barrels. In October 2007, the authorized cavern capacity of Bayou Choctaw was temporarily decreased from 76 million barrels to 73.5 million barrels due to a net reduction of 2.5 million barrels of authorized capacity in Bayou Choctaw Cavern 20. The reduction was required because the lower half of Cavern 20 was determined to pose a high environmental risk after it was discovered that the cavern had begun to leach towards the edge of the salt dome. Decommissioning of Cavern 20 began in 2014 and was ongoing as of December 31, 2014.

The Bayou Choctaw site became operational in 1987. The SPR annually performs a number of major maintenance projects to maintain the site's operational capabilities.

St. James Marine Terminal Status

The SPR constructed a marine terminal on the Mississippi River at St. James, Louisiana, in the 1970s to support fill and drawdown of the SPR sites. The terminal has six above ground storage tanks with a total storage capacity of two million barrels. The St. James terminal is leased to Shell Oil Products US under a long-term lease agreement that expires in 2017 and will require re-competition. Under the lease agreement, Shell provides for all normal operations and maintenance of the terminal and is required to support the SPR as a sales and distribution point in the event of a drawdown.

A pipeline between the St. James terminal and the adjacent LOCAP terminal enhances the SPR's emergency distribution capabilities by enabling unencumbered crude oil distribution to the LOCAP terminal, the ExxonMobil pipeline, and the Plains terminal.

V. Capacity Maintenance Program

SPR storage caverns are subject to continuous progressive “creep closure” due to naturally occurring geological forces. This closure reduces the unfilled capacity (ullage) of the caverns required to maintain their long-term storage capacity. During 2010 and 2011, projections were made based on current ullage, creep rates, and workover program impacts that indicated that cavern ullage would be depleted sometime between 2012 and 2013. As a consequence, studies were made to determine the best strategy to mitigate the problem that resulted in the implementation of a leaching program at three sites which began in 2011 and continued through 2012 and 2013.

At West Hackberry, the 2013 leaching program included injecting raw water into a sour cavern and transferring the crude oil into another sour cavern. During the year, simultaneous operations of leaching this sour cavern and transferring crude oil out of another sour cavern occurred, thereby achieving two SPR program objectives. As of December 31, 2013, 6.1 million barrels of raw water were injected, thereby creating approximately 611,000 barrels of ullage. There were no leaching activities at West Hackberry in 2014. West Hackberry will provide sour ullage for both West Hackberry and Big Hill.

At the Big Hill site, the 2013 leaching plan involved transferring sweet crude between caverns using raw water to create ullage. The space created will be used for both West Hackberry and Big Hill sweet. As of December 31, 2013, the site had injected 12.42 million barrels of raw water into the sweet caverns, thereby creating approximately 1,242,000 barrels of ullage. There were no leaching activities at Big Hill in 2014.

VI. West Hackberry Cavern 6 Transfer Plan

In 2013, access to the sour crude oil inventory in West Hackberry Cavern 6 was considered at risk. Cavern 6 is a three well cavern with the following history:

- Well 6B Borehole failed and a liner was installed in 2002.
- Well 6 Borehole failed and the well was plugged and abandoned in 2011.
- Well 6C Borehole failed a Mechanical Integrity Test (MIT), a liner was cemented in, the borehole failed, and the well was plugged in 2012.

Because of this well history and the associated risk, the decision was made to empty Cavern 6 while there is still ready access. After the cavern is empty, it will be placed in a "maintain and monitor" status, and all regulatory requirements will continue to be met.

Crude oil removal out of Cavern 6 began February 1, 2013 as a single closed loop cavern to cavern movement. Oil was transferred from Cavern 6 to a receiving cavern. The brine from the receiving cavern was then transferred to Cavern 6. During the year, simultaneous operations of transferring crude oil out of Cavern 6 and leaching another sour cavern occurred, thereby achieving two SPR program objectives.

As of December 31, 2014, the readily accessible oil, approximately 5.8 MMB of the 6.4 MMB inventory in Cavern 6 has been transferred. Oil will continue to be removed as it gradually seeps into the well 6-C borehole.

VII. Bryan Mound Cavern 2 Transfer Plan

In 2014, access to the sweet crude oil inventory in Bryan Mound Cavern 2 was considered at risk. Cavern 2 is a two well cavern. Both Well 2 and 2A failed a Mechanical Integrity Test in 2013.

Because of this well history and the associated risk, the decision was made to empty Cavern 2 while there is still ready access. After the cavern is empty, geotechnical analysis and well stabilization will occur. Crude oil removal out of Cavern 2 began March 2, 2015 as a single closed loop cavern-to-cavern movement. Oil will be transferred from Cavern 2 to a receiving cavern. The brine from the receiving cavern will then be transferred to Cavern 2. This process is expected to take approximately 2 years. Regulatory requirements will be met during this period.

VIII. Petroleum Acquisition and Exchange

Crude Oil Inventory Status

On December 31, 2014, the SPR's crude oil inventory was 690,959,434 barrels, a decrease of 5,009,631 barrels from the prior year. The net decrease resulted primarily from Test Sale 2014 barrels delivered from the SPR.

Oil Acquisition Market Assessments

The *Procedures for the Acquisition of Petroleum for the SPR* (10 CFR Part 626) establish the rules and procedures for acquiring SPR crude oil. These procedures require that a comprehensive market assessment be performed prior to initiation or continuation of any oil fill activities to ensure the SPR acquisition activities will not unduly affect the current market conditions. There were no market assessments completed in 2014 as no new oil acquisition activities were initiated.

Fill of Reserve

Detailed information about the SPR's fill program since 1977 can be found in the following:

- Table 2 lists year-end inventories and average daily fill rates for the years 1977 through 2014 (by fiscal and calendar year).
- Table 3 lists crude oil receipts by country of origin into the SPR since 1977.
- Table 4 identifies the location of the inventory by storage site, and Figure 3 illustrates the cumulative oil fill by year.

Table 2
Year-End Inventories and Oil Fill History

	FISCAL YEAR		CALENDAR YEAR	
	Year-End Inventory (MMB)	Average Daily Fill Rate[1] (MB/D)	Year-End Inventory (MMB)	Average Daily Fill Rate[1] (MB/D)
1977	1.1	3	7.2	20
1978	49.1	131	68.5	168
1979	91.2	115	91.7	64
1980	92.8	4	107.8	44
1981	199.2	292	230.3	336
1982	277.9	215	293.8	174
1983	361.0	228	379.1	234
1984	431.1	191	450.5	195
1985	489.3	159	493.3	119
1986	506.4	47	511.6	51
1987	533.9	75	540.6	80
1988	554.7	57	559.5	52
1989	577.1	62	579.9	56
1990	589.6	34	585.7	27
1991	568.5	(58)	568.5	(47)
1992	571.4	8	574.7	17
1993	585.7	39	587.1	34
1994	591.7	16	591.7	13
1995	591.7	*[2]	591.6	*[2]
1996	573.6	(49)	565.8	(70)
1997	563.4	(28)	563.4	(7)
1998	563.4	*[2]	561.1	(6)[3]
1999	564.9	4	567.0	16
2000	570.3	15	540.7	(72)[4]
2001	544.8	(70)[4]	550.2	26
2002	587.2	116	599.1	134
2003	624.4	102	638.4	108
2004	670.3	126[5]	675.6	102[5]
2005	693.7	64[6]	684.5	25[6]
2006	687.8	(16)[7]	688.6	11[7]
2007	692.8	14	696.9	23
2008	702.4	26[8]	701.8	13[8]
2009	725.1	62.2	726.6	67.9
2010	726.5	3.8	726.5	(0.2)[9]
2011	695.9	(84)[10]	695.9	(84)[10]
2012	694.9	(3)[11]	695.3	(2)[11]
2013	696.0	3	696.0	2
2014	691.0	(13.6)[12]	691.0	(13.6)[12]

MMB = Million Barrels MB/D = Thousands of Barrels per Day ( ) = Denotes a Reduction

1. Fill rates adjusted for oil sales
2. Fill suspended during this period
3. Decrease due to Maya exchange
4. Net decrease due to Exchange 2000
5. Net Hurricane Ivan deliveries and receipts
6. Net Hurricane Ivan receipts & Katrina deliveries and receipts
7. Net Hurricane Katrina exchange and drawdown sales
8. Net Hurricanes Gustav & Ike deliveries
9. WH/BC Exchange oil costs and degas loss
10. Drawdown 2011
11. Hurricane Isaac Exchange
12. Test Sale 2014

Table 3
Crude Oil Receipts
(As of December 31, 2014)

Source Country	2014 (MMB)	Cumulative (MMB)	Percent of Total (%)
Mexico		266.3	31.2
United Kingdom		193.9	22.7
United States*		106.5	12.5
Saudi Arabia		28.3	3.3
Libya		27.5	3.2
Venezuela		25.3	3.0
Angola		25.1	2.9
Russia		25.1	2.9
Iran****		20.0	2.3
United Arab Emirates		19.3	2.3
Nigeria		16.3	1.9
Algeria		15.7	1.8
Cameroon		15.1	1.8
Equatorial Guinea		15.1	1.8
Norway		14.0	1.6
Oman		12.9	1.5
Egypt		8.9	1.0
Ecuador		6.2	0.7
Iraq		3.4	0.4
Gabon		2.4	0.3
Qatar		2.3	0.3
Azerbaijan		2.1	0.2
Columbia		1.2	0.1
Argentina		0.4	≤0.1
Ivory Coast		0.4	≤0.1
Peru		0.4	≤0.1
Total**		854.1***	100.0

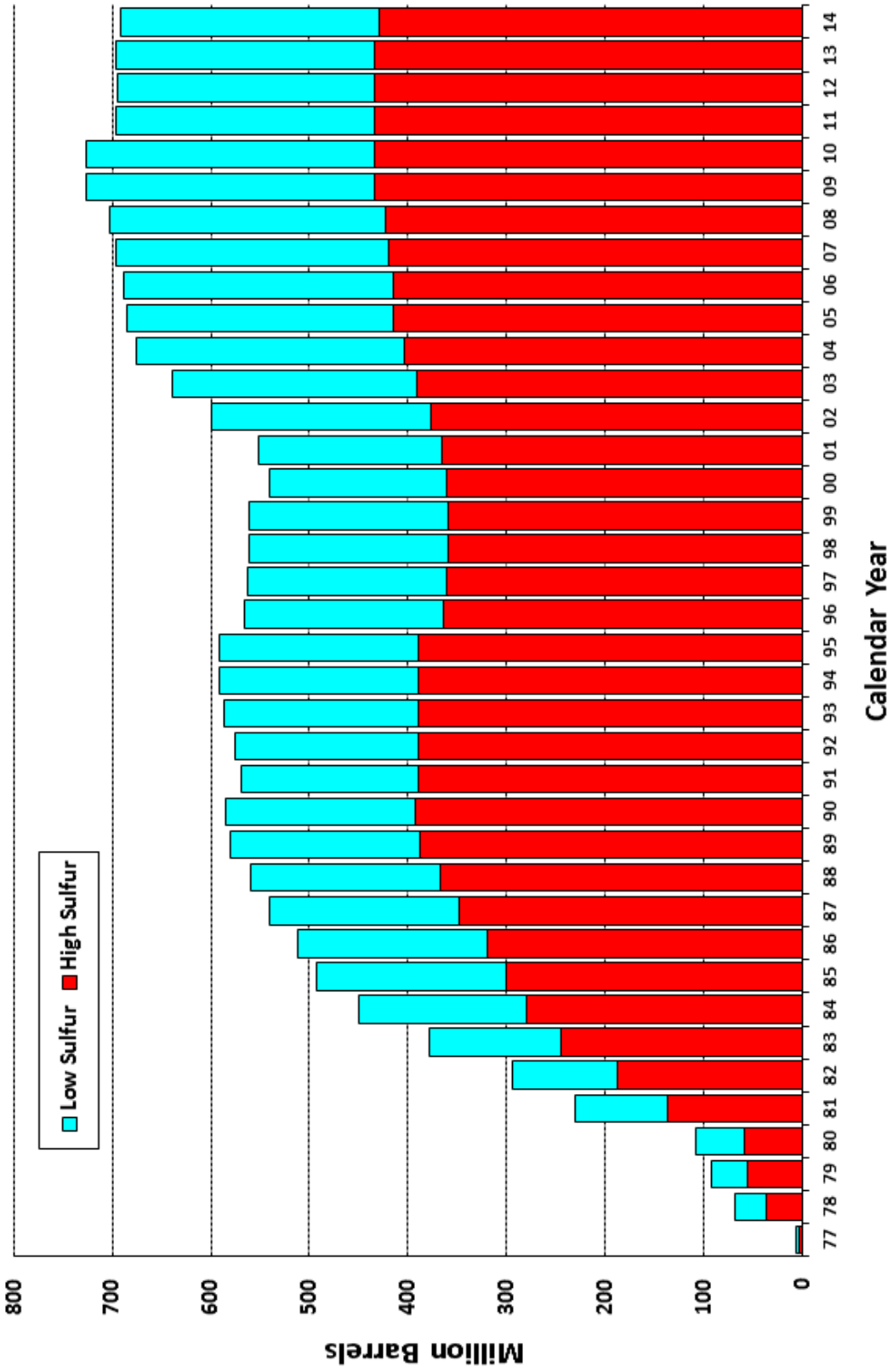
MMB = Million Barrels
* Included receipts from offshore Gulf of Mexico.
** Totals do not add due to rounding.
*** Cumulative total receipts unadjusted for sales and operational gains and losses.
**** Prior to 1995

Table 4
Crude Oil Inventory
(As of December 31, 2014)

Storage Site	Inventory (MMB)		
	Sweet*	Sour**	Total***
Bryan Mound, Brazoria County, Texas	64.4	176.4	240.8
Big Hill, Jefferson County, Texas	67.8	94.6	162.4
West Hackberry, Cameron Parish, Louisiana	107.8	105.5	213.3
Bayou Choctaw, Iberville Parish, Louisiana	21.8	51.8	73.6
Subtotal Underground Inventory	261.8	428.3	690.1
Tanks and Pipelines	0.1	0.8	0.9
Total Inventory	261.9	429.1	691.0
Total Accounts Receivable	0.0	0.0	0.0
Total SPR Book Inventory	261.9	429.1	691.0

MMB = Million Barrels
* Sulfur content not exceeding 0.5 percent
** Sulfur content greater than 0.5 percent
*** Totals do not add due to rounding

Figure 3
Cumulative Oil Fill



IX. Emergency Response Capabilities

Sale of Oil

Section 161 of the *Energy Policy and Conservation Act* (EPCA) gives authority to the President under specified conditions to direct the Secretary of Energy to conduct a public sale of oil from the SPR. Contracts are awarded to the highest qualified offerors.

Competitive Sales Procedures

DOE regulations in 10 CFR Part 625 govern the process for price competitive sales from the SPR, including the establishment of Standard Sales Provisions that contain provisions to be utilized in the contracts for the sale of the SPR crude oil. The first step in the process is the issuance of a Notice of Sale identifying the volume, characteristics, and location of the petroleum for sale. The Notice of Sale also provides delivery dates and the requirements to successfully submit offers. Measures required for assuring performance and financial responsibilities are also described in the Notice of Sale.

During a drawdown, multiple Notices of Sale may be issued through the use of a web-based automated oil sales and evaluation system, which provides a triple redundant backup system. Each Notice of Sale covers a sales period of one to two months. Offerors may have five days or less from the date a Notice of Sale is issued until offers are due. Delivery of oil could commence as soon as 13 days after the President calls for a drawdown of the SPR. Subsequent sales periods, if necessary, will coordinate with standard industry delivery periods. Because of the possible short initial lead-time, DOE maintains a registry of prospective offerors who will receive electronic notification of all Notices of Sale.

The second step in the sales process is for prospective purchasers to submit offers, as specified in the Notice of Sale. Offerors must unconditionally accept all terms and conditions in the Notice of Sale and submit an offer guarantee of five percent of the maximum potential contract amount, or $10 million, whichever is less. The offer evaluation process is structured so that the offerors bidding the highest prices will determine the transportation methods, up to the limits of the distribution system. Specific delivery arrangements are negotiated later in the process.

Within five business days of being notified, all "apparently successful offerors" are required to provide a Letter of Credit equal to 100 percent of the contract amount as a guarantee of performance and payment of amounts due under the contract. Upon timely receipt of the financial guarantees, and a final determination by the Contracting Officer that offers are responsive and selected offerors are responsible, Notices of Award are issued. Deliveries to the purchasers may then begin, consistent with the purchasers' arrangements for commercial pipeline or marine vessel transportation.

Following delivery, the purchaser is invoiced for actual barrels received at a price that reflects the indexed contract award price, plus any adjustments for quality differentials, delivery mode, or location changes. Payment is due within 30 days following the delivery.

Drawdown Capabilities[3]

The crude oil acquired for the SPR is commingled in caverns at the storage sites, creating various distinct crude oil streams available for release. Table 5 identifies these crude oil streams, delivery modes, and locations.

Based on its design drawdown rate, the SPR can draw down crude oil at an initial sustainable rate of 4.415 MMB/D[4] for a period of 90 days. After this period, the drawdown rate gradually decreases as site inventories are depleted and the declining number of caverns containing crude oil becomes a constraint.

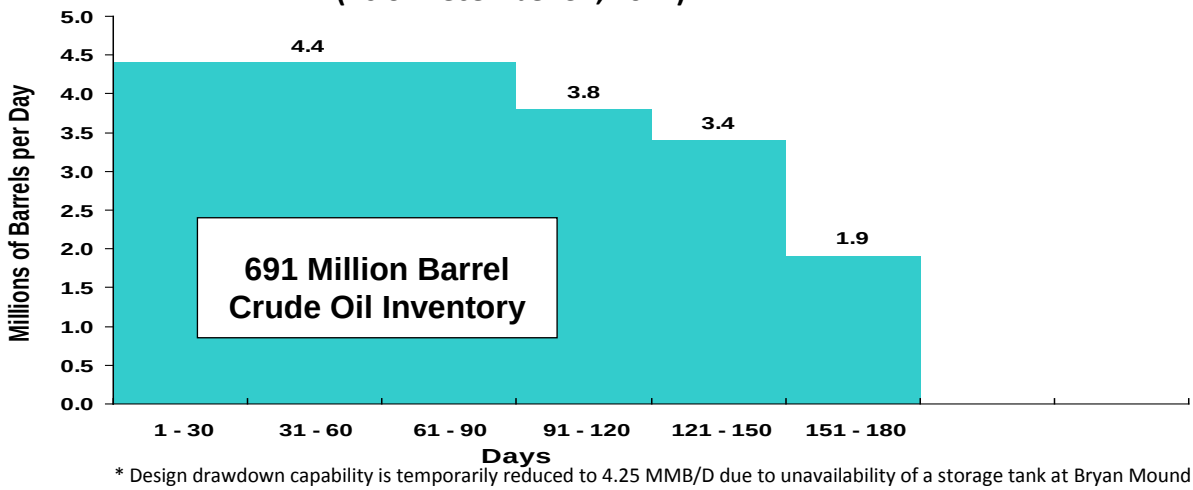
Table 5
Crude Oil Streams
(As of December 31, 2014)

Crude Oil Stream	Gravity (°API)	Sulfur Content (Mass %)	Delivery Mode and Location
Seaway System			
Bryan Mound (Sweet)	36.4	0.38	Pipeline at Jones Creek Tank Farm, Jones Creek, Texas; Tankship at Seaway (Enterprise Products) Terminals in Freeport and Texas City, Texas
Bryan Mound (Sour)	33.3	1.41	
TEXOMASystem			
West Hackberry (Sweet)	36.9	0.33	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline at Shell-22"/DOE connection, Lake Charles, Louisiana
West Hackberry (Sour)	33.5	1.38	
Big Hill (Sweet)	35.4	0.40	Pipeline, tankship or barge at Sun Partners Marketing & Terminals LP, Nederland, Texas; Pipeline or tankship at Phillips 66 Terminal Nederland, Texas; Pipeline at Shell-20"/DOE connection, Winnie, Texas
Big Hill (Sour)	30.8	1.44	
Capline System			
Bayou Choctaw (Sweet)	35.4	0.43	Pipeline at Capline, Plains Marketing or LOCAP Terminals, St. James, Louisiana; Tankship at Sugarland St. James Terminal, St. James, Louisiana; 24-inch site connection to Red Stick Pipeline, Iberville Parish, Louisiana
Bayou Choctaw (Sour)	31.9	1.46	

[3] This refers to the ability to pump oil out of the SPR caverns without considering whether the downstream distribution of the oil to SPR customers would accommodate that much oil being pumped out of the SPR caverns.
[4] As of December 2014, drawdown capability has been reduced to 4.22 MMB/D due to required repairs in Tank 2 and Tank 4 at Bryan Mound.

Figure 4 illustrates the design drawdown capabilities during 2014 of 382.5 million barrels in 90 days and 691.0 million barrels in 180 days.

Figure 4
Design Drawdown Capability
(As of December 31, 2014)*



* Design drawdown capability is temporarily reduced to 4.25 MMB/D due to unavailability of a storage tank at Bryan Mound that is used during drawdown.

Drawdown Readiness Activities

The SPR performed the following drawdown readiness assurance activities during 2014:

- Test Sale 2014 was conducted in April-May 2014. Over the two months, 5 million barrels of crude oil was delivered from Big Hill and West Hackberry via pipeline and vessel.

- The Drawdown Readiness Review program requires and monitors quarterly drawdown readiness. Four reviews were conducted in 2014, confirming that all sites and systems were prepared for a crude oil drawdown or exchange of the SPR.

- The Systems Test Exercise (STE) program determines the drawdown readiness of a SPR site's equipment, procedures, systems, and personnel, and collects data to further ensure a readiness status. The STE program involves a tabletop exercise at each site every year and a dynamic site test performed when directed. In 2014, tabletop exercises were conducted at all four sites.

  An administrative tabletop exercise was successfully conducted at Big Hill on February 5, 2014. This exercise simulated a drawdown with the following deliveries: Shell Pipeline (15 days) February 5, 2014 – February 20, 2014, for a total of 1.5 MMB sour delivered in

300 MB batches at 10,000 BPH (240 MB/D). Chevron Terminal (15 days) February 21, 2014 – March 8, 2014, for a total of 3.0 MMB sour delivered in 500 MB batches at 20,000 BPH (480 MB/D).

An administrative tabletop exercise was successfully conducted at Bryan Mound on May 28, 2014. This exercise simulated a drawdown with the following deliveries: Texas City for a total of 10 MMB Sweet delivered at a maximum rate of 1053 MB/D.

A Modified Recovery Program (RPX) tabletop exercise was successfully conducted at Bayou Choctaw on two days in June 2014. The first day of the exercise was held at the Stennis Facility and the second day was conducted at Bayou Choctaw. This exercise involved extensive discussions covering the activation, installation, operation and demobilization of the Bayou Choctaw Recovery Program. The Emergency Pipeline Contractor was among the exercise participants.

An administrative tabletop exercise was successfully conducted at West Hackberry on July 9, 2014. This exercise simulated a drawdown with the following deliveries: Lake Charles Meter Station (LCMS) (30 days) July 9, 2014 – August 7, 2014, for a total of 4.5 MMB Sour delivered in 150 MB batches at 12,500 BPH (300 MB/D). The deliveries alternated batches between Citgo/Conoco (Shell Middle and Upper Junction) and Houma (Shell Ho-Ho).

Test Sale

Due to recent changes to interconnected pipeline systems as well as commercial terminal delivery points, a test sale was carried out to evaluate the drawdown and sales procedure capabilities of the reserve in the TEXOMA distribution system. The successful completion confirmed that the SPR maintains a persistent readiness posture to provide crude oil within thirteen days under a competitive sale.

A Test Sale was conducted by the SPR in 2014 to test recent changes to interconnected pipeline systems as well as commercial terminal delivery points. The SPR issued a Notice of Sale on March 12, 2014, setting in motion the drawdown and sales process for the test sale. The Notice of Sale offered five million barrels of light sour crude from Big Hill and West Hackberry, the two SPR sites in the SPR TEXOMA distribution system. When the offering closed on March 14, 2014, the SPR had received 37 bids from 12 companies requesting a total of 18.5 million barrels of crude oil. On March 17, 2014, the SPR announced five companies as successful offerors, which were subsequently awarded contracts for five million barrels.

The SPR initiated crude oil deliveries on March 31, 2014, and completed the final delivery on May 16, 2014. The SPR scheduled 41 separate crude oil deliveries, delivered 4.62 million barrels (92.4 percent) by pipeline, and 380,000 barrels (7.6 percent) via marine transportation – on schedule, with no personnel accidents or environmental incidents. All pipeline and marine deliveries were to Gulf Coast refiners located in Texas and Louisiana.

The 2014 SPR Test Sale was conducted to exercise both the sales procedures and the drawdown process. While the sale was successful in achieving the stated objectives, there were areas noted for improvement. Those lessons learned from this evaluation are as follows:

- Pipeline capacity is limited in TEXOMA distribution system.
- Storage capacity at crude oil terminals (contracted by SPR) is limited.
- A drawdown of significant scope may pose a challenge to the SPR's marine distribution capability.
- A second custody transfer flow metering skid at the SPR Big Hill site could improve distribution flexibility and reliability.

It is worth noting that the above lessons were identified during a test sale during a non-emergency period. More detailed information on the test sale can is available in the 2014 SPR Test Sale Report to Congress, published in November 2014.

Distribution Capabilities

The substantial increase in both Canadian and U.S. domestic production has had a significant impact on both the magnitude and spatial disposition of crude oil supply over the past decade. Though several other regions of the country have emerged as significant supply centers, the Gulf Coast has turned into a major refining and trans-shipment destination for crude oil. As a result, there have been significant changes in the use of oil distribution infrastructure. Through 2011, most major pipelines originated in the Gulf Coast region and provided crude oil to local refineries and Midwest refiners. Since then, several major pipelines have reversed direction and are now flowing crude to the U.S. Gulf Coast refining centers and thereby reducing imports.

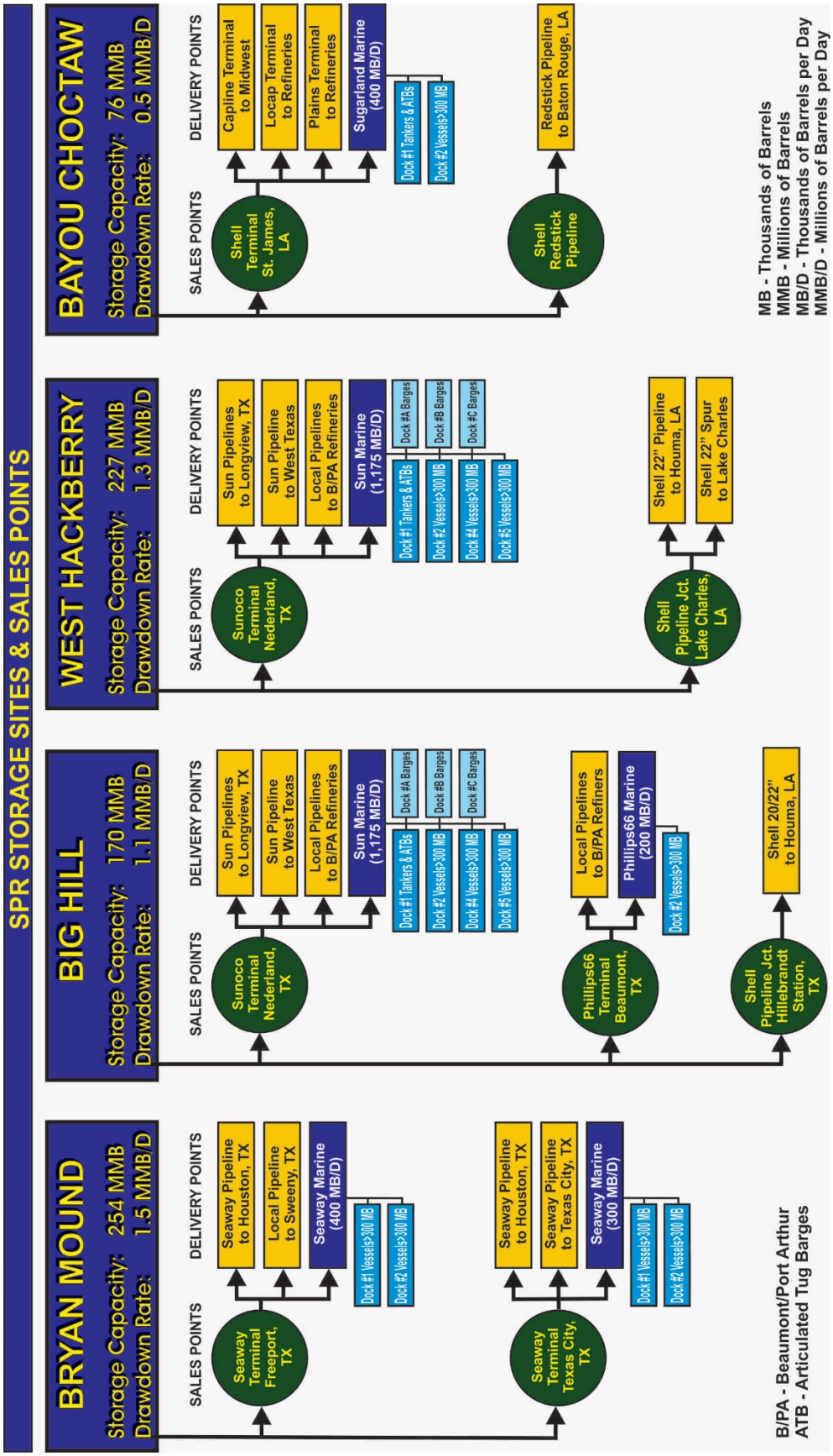
Consequently, in 2012, the SPR lost connectivity to 10 refineries in the Central U.S. when the Seaway Pipeline's flow direction was reversed. The Seaway Pipeline now flows from Cushing, Oklahoma, to Freeport, Texas. In December 2013, Shell reversed section of the pipeline system, now referred to as the Houston-to-Houma system (formerly Houma-to-Houston), to flow eastbound from Houston to the Louisiana Offshore Oil Port's terminal in Clovelly, Louisiana. As a result, the SPR's Big Hill site lost connectivity to Houston area refineries, reducing the number of potential buyers that can receive SPR oil by pipeline.

Currently, the SPR is connected by commercial pipeline systems to about 57 percent of the refining capacity in the U.S. That connection covers 45 refineries, which processed approximately 62 percent of crude oil imports to the U.S. during 2014.

The SPR is also connected to four marine terminals that have a combined contracted marine distribution capacity of 2.075 MMB/D and own one marine terminal with a distribution capacity of 0.400 MMB/D that is leased to Shell. These are: Seaway Terminal (Enterprise Products),

Freeport, Texas; Seaway Terminal (Enterprise Products), Texas City, Texas; Sunoco Terminal, Nederland, Texas; Phillips 66 Beaumont Terminal, Nederland, Texas; and Shell Sugarland, St. James Terminal, St. James, Louisiana. Figure 5 illustrates the SPR's pipeline and marine distribution capabilities.

Figure 5
Pipeline and Marine Design Distribution Capabilities



Distribution Assessment

The SPR performs an annual assessment based on its established technical and performance criteria that evaluates the SPR's crude oil distribution system capabilities to (a) ensure that there are adequate connections to the commercial distribution systems and (b) identify the need for any remedial plans. The 2014 Distribution Assessment evaluated the SPR's theoretical capability, at its maximum drawdown rate, to replace oil imported in the base year (2013) and, from the 2014 perspective, for future years 2015, 2020 and 2030. This report does not intend to model distribution capability during an actual emergency oil disruption event.

Established Level I Technical and Performance Criteria for the SPR's distribution capabilities require that the physical distribution system infrastructure, both DOE-owned and commercial, shall be capable of meeting distribution rates exceeding 120 percent of the combined site drawdown rates in order to provide sufficient allowances for terminal operational delays and commercial demand variances.

The distribution assessment and the results summarized below is based on a study of the Physical Distribution Capacity which is the total capacity of all physical connections from the SPR storage sites to commercial pipelines and marine terminals, including the DOE owned St. James terminal. It assumes that during a commercial supply disruption, the SPR is capable of utilizing 100 percent of its contractual terminaling services to move oil from the DOE pipeline to vessels loading at the terminal's dock or to third party pipelines or tankage via the contractor's existing connections. As stated previously, such an assumption is unlikely to reflect the actual effective distribution capability during an emergency oil disruption event.

Base Year Assessment

The base-year assessment indicates that two of the three SPR Systems were compliant with Level I Performance Criteria (offsite pipeline and marine distribution capabilities exceed 120 percent of the combined maximum drawdown rates). The Level 1 Performance criteria for the TEXOMA System remained below 120 percent for two years in a row as a result of petroleum infrastructure additions, pipeline reversals, and the resulting marine terminal and pipeline congestions.

Table 6 provides the performance measures for the base and previous year.

Table 6
Base Year Distribution Assessment

System	Max. Drawdown Rate (MB/D)	Physical Distribution Capability (MB/D)	Performance Measure As of 12/31/2013	Performance Measure As of 12/31/2012
Seaway	1,350*	1,826	135%	169%
TEXOMA	2,400	2,677	112%	114%
Capline	515	943	183%	222%
Total	4,265*	5,446	128%	145%

MB/D = Thousands of Barrels per Day
*The unavailability of a storage tank at Bryan Mound has temporarily reduced the Seaway System maximum drawdown rate for the base year from 1,500 MB/D to 1,350 MB/D.

Future Year Assessments

From the 2014 perspective, for future years 2015, 2020, and 2030, the SPR performed an assessment using the U.S. petroleum refining supply and demand projections from the Energy Information Administration's *Annual Energy Outlook 2014 (AEO 2014)*. The future year assessment assumes the design drawdown rate does not change from base year levels and assumes no infrastructure changes to the SPR. Based on the *AEO 2014* projections for U.S. petroleum imports, the Distribution Assessment concluded that the physical distribution capability of the SPR falls below Level 1 Performance Criteria during the out years with the current infrastructure in place, for the TEXOMA system. In light of these results, remedial planning has commenced to address the insufficient connectivity to commercial physical distribution systems. Table 7 provides the performance measures by system for the base year and each forecast period.

Table 7
Base and Future Years
Performance Measures

System	2013	2015	2020	2030
Seaway	135%	123%	127%	143%
TEXOMA	112%	101%	96%	104%
Capline	183%	142%	131%	146%

Physical vs. Effective Distribution Capability

The assessment discussed above focuses exclusively on the SPR's physical distribution capability, which is distinct from the *effective* distribution capability. The former focuses on the actual pipeline connections that the SPR maintains to physical assets, while the effective distribution capability is the rate that SPR crude oil can be incrementally added to the market and is dependent upon oil market activity, the utilization of commercial pipelines and commercial terminals at the time of drawdown, and the magnitude and geographical location of the oil supply disruption.

In reality, the ability of SPR to distribute incremental oil without disrupting domestic and Canadian crude flows has been diminished due to congestion of commercial facilities in the SPR's Gulf Coast distribution region. In recent years, the changing geography of U.S. oil production has led to major changes in the domestic oil refining and distribution systems. New patterns of oil supply and demand among U.S. oil producers and refineries, along with associated changes in the U.S. midstream, have significantly reduced the ability of the SPR to distribute *incremental* volumes of oil during possible future oil supply interruptions. Moving SPR oil to Midwest refineries—a historical pattern—would be of little value during a petroleum supply disruption as non-Canadian imports and Gulf Coast supplies into this refining complex have essentially disappeared. The U.S. pipeline distribution system, along with other modes of oil transport, is instead moving large volumes of oil to the Gulf Coast, especially from U.S. tight oil plays and Canada. This new geography of U.S. oil production and energy exports has also increased commercial traffic at U.S. Gulf Coast marine loading facilities.

While the SPR has throughput contracts for dock space utilization at five marine terminals within the SPR distribution system, use of these docks for the distribution of SPR crude oil will cause displacement of domestically produced oil and/or Canadian imported oil. The changing patterns of U.S. oil imports mean that the magnitude and geographic location of an international oil supply disruption can affect the capacity of the SPR to deliver oil to its customers and the ability of the U.S. to meet its International Energy Program (IEP) obligations in the event of an International Energy Agency (IEA) collective action in response to a global supply disruption. If the SPR cannot load oil onto barges and tankers without disrupting commercial shipments, SPR sales could be offset by a corresponding decrease in domestic crude oil shipments or exports of domestically produced petroleum products. For all of these reasons—the evolution of global oil markets, the participation of the U.S. in those markets, the changed geography and volume of U.S. oil supplies, reduced oil imports, and congestion of commercial facilities in the SPR's distribution region—an effective SPR release using the current infrastructure configuration will increasingly depend on the ability to load *incremental* SPR oil onto marine vessels.

In 2014, the Office of Petroleum Reserves began an assessment of the SPR's effective distribution capability that looks at what the reserve could deliver to the market under various supply disruption scenarios. This project will quantify the SPR's distribution capabilities in

terms of incremental barrels that can be added to the market without disrupting commercial flows.

The Department's Quadrennial Energy Review (QER) found that the SPR's ability to offset future energy supply shortages has been adversely impacted by domestic and global oil market developments coupled with the need for upgrades. One of the QER's recommendations was to invest to optimize the SPR's energy response capability, including the need to increase the Reserve's incremental distribution capability by adding dedicated marine terminal capacity to the SPR distribution system.

International Energy Program Requirements

The U.S., as a member of the International Energy Agency, is committed to maintaining stocks of crude oil and products in reserves that are equivalent to 90 days of net oil imports. Computations of member-nations' stockpile requirements are based on both publicly and privately held stocks, and net imports are defined as the average daily level in the previous year.

In the event of a severe petroleum supply interruption, the IEA Governing Board may choose to collectively release oil stocks to respond to the crisis. In a coordinated IEA response, each member country is responsible for a share of the total release that is proportionate to their share of total IEA oil consumption. For the U.S., this share was 43.5 percent in 2014.

X. Commercial Activities

Commercial Leases

The Strategic Petroleum Reserve has commercialized its under-utilized crude oil distribution facilities to be more cost-effective, and currently has leased three crude oil pipelines and a marine terminal to private industry. The contracts for these leases require that the facilities be maintained in good condition and, in the event of a Presidential call for an emergency drawdown, use of the leased facilities will be returned to the Government on five days' notice. Receipts from the leases are deposited to the U.S. Treasury.

Bayou Choctaw Pipeline: In 2014, lease revenues totaled $188,695. This pipeline was leased to Shell Pipeline Company LP on May 1, 1997, on a revenue-sharing basis. In 1998, the lease was converted from an annual lease to a ten-year lease with automatic renewals in five (5) year increments thereafter. The current lease period expires on December 31, 2017.

Bryan Mound Pipelines: In 2014, lease revenues totaled $6,513,476. Two of the three Bryan Mound pipelines were leased to ExxonMobil Pipeline Company on January 14, 1999. ExxonMobil began using the pipelines in June 2000 as part of its onshore distribution system for the Diana-Hoover production in the Gulf of Mexico. The first five-year option of the lease agreement was executed and began in June 2010. The second and final five-year option of the lease agreement was executed on February 12, 2014, for the period of June 1, 2015 - May 31, 2020.

St. James Terminal: In 2014, St. James Terminal lease revenues were $2,000,000. The terminal was leased to Shell Pipeline Corporation (now Equilon Enterprises LLC, "doing business as" Shell Oil Products US) on January 31, 1997, on a revenue-sharing basis. On April 2, 2003, the contract was renegotiated for a period of ten years in the amount of $1.7 million per year, with a five-year option in the amount of $2 million per year. Payments were retroactive to January 1, 2003.

Commercial Revenues

During calendar year 2014, receipts to the U.S. Treasury were $8,702,171 from the commercial leases of the Strategic Petroleum Reserve's distribution facilities and pipelines. Table 8 summarizes commercial revenues from 1996 to 2014.

Table 8
Summary of Commercial Revenues
(December 31, 2014)

Calendar Year	Bryan Mound Pipeline (Actual $)	Big Hill Pipeline (Actual $)	Bayou Choctaw Pipeline (Actual $)	St. James Terminal Lease (Actual $)	Total Revenue Generated (Actual $)
1996	102,606	472,809	0	0	575,415
1997	0	429,824	0	133,300	563,124
1998	12,500	402,525	0	481,010	896,035
1999	679,393	400,000	163,030	546,125	1,788,548
2000	652,146	493,359	217,573	748,986	2,112,064
2001	1,054,297	33,104	212,738	1,227,021	2,527,160
2002	1,468,613	0	249,708	1,285,183	3,003,504
2003	1,647,828	0	168,718	1,863,060	3,679,606
2004	1,546,121	0	174,338	1,700,000	3,420,459
2005	1,132,668	0	730,542	1,700,000	3,563,210
2006	1,091,799	0	337,949	1,700,000	3,129,748
2007	1,128,340	0	218,912	1,700,000	3,047,252
2008	1,211,171	0	321,799	1,700,000	3,232,970
2009	1,141,228	0	232,374	1,700,000	3,073,602
2010	1,091,494	0	169,541	1,700,000	2,961,035
2011	2,124,218	0	318,183	1,700,000	4,142,401
2012	5,838,356	0	312,481	1,700,000	7,850,837
2013	17,270,421	0	274,481	1,975,000	19,519,902
2014	6,513,476	0	188,695	2,000,000	8,702,171

XI. Budget and Finance

With enactment of the Consolidated Appropriations Act, 2014 (Pub L. 113-76), fiscal year 2014 budget authority for the Strategic Petroleum Reserve was $189.4 million.

Appropriations through Fiscal Year 2014

A total amount of $24.2 billion, net of sales and transfers, has been appropriated for the Strategic Petroleum Reserve through fiscal year 2014. The distribution of this annual appropriation is described in Table 9.

Strategic Petroleum Reserve Account

The SPR Account funds the development, operation, and maintenance of facilities; the salaries and expenses necessary to plan and manage the program, including the operation of the Project Management Office in New Orleans, Louisiana; and the activities pertinent to major issues concerning the development and use of the SPR.

Obligations for the SPR in fiscal year 2014 totaled approximately $186.8 million. From this amount, $19.2 million was obligated for Federal program management. $167.7 million was obligated for contractual goods and services to operate and maintain the SPR and to conduct an emergency drawdown and sale, if required.

Table 9
Appropriations for Storage Facilities Operations and Management and Petroleum Account*
(As of December 31, 2014)

Fiscal Year	Oil Account ($000)	Facilities ($000)	Management ($000)	Expansion ($000)	Total ($000)	Defense SPR ($000)
1976	0	300,000	13,975		313,975	
1977	440,000	0	7,824		447,824	
1978	2,703,469	463,933	14,704		3,182,106	
Total 1979 Appropriations*	2,356,456	632,504	18,111		3,007,071	
Total 1980 Appropriations*	(2,022,272)	0	22,272			
Total 1981 Appropriations*	3,205,094	108,168	19,391		3,332,653	
Total 1982 Appropriations*	3,679,700	175,656	20,076		3,875,432	
1983	2,074,060	222,528	19,590		2,316,178	
1984	650,000	142,357	16,413		808,770	
1985	2,049,550	441,300	17,890		2,508,740	
Total 1986*	(12,964)	106,979	13,518		107,533	
1987	0	134,021	13,412		147,433	
1988	438,744	151,886	12,276		602,906	
1989	242,000	160,021	13,400		415,421	
1990	371,916	179,530	12,953		564,399	
1991	566,318	187,728	12,846		766,892	
1992	88,413	171,678	13,384		273,475	
1993	(125,625)	161,940	14,227		50,542	
DOD Transfer (non add)	124,925	700	0		125,625	125,625
1994	0	191,035	15,775		206,810	
1995	(107,764)	226,938	16,780		135,954	
1996 transfer from SPR Petro Acct	(187,000)	170,173	16,827		0	
1996 Weeks Island Oil Sale	(97,114)	97,114	0		0	
1996 deficit reduction oil sale	(227,000)	0	0		(227,000)	
1996 Total	(511,114)	267,287	16,827		(227,000)	
1997 Total*	(220,000)	193,000	16,000		(11,000)	
1998	0	191,500	16,000		207,500	
1999	0	145,120	14,805		159,925	
2000	0	144,000	15,000		159,000	
2001	0	140,672	15,965		156,637	
2002	0	154,009	16,871		170,880	
2003	1,955	157,823	13,909		173,687	
2004	0	155,044	15,904		170,948	
2005*	43,000	109,946	16,764		169,710	
2006*	(43,000)	190,510**	16,830		207,340	
2007	0	146,950	17,491		164,441	
2008		143,980	18,004	24,773	186,757	
2009	(21,586)	176,255***	18,824	31,507	226,586	
2010	0	199,732	19,091	25,000	243,823	
2011	0	186,873	22,568	0	209,441	
2012*	0	172,914	19,790	0	192,704	
2013*	0	162,975	19,650	0	182,625	
2014	235,587****	167,514	21,846		424,947	

Note: FY 1991 SPR Petroleum Account of $566,318 includes proceeds of $122,681 from the Test Sale recorded as additional budget authority, rather than reductions to obligations, costs, and outlays. It also includes $315,424,985 in Desert Storm Drawdown proceeds from January 1991, and $19,755,064 from FY 1991 Naval Petroleum Reserve excess receipts. Thus, the cumulative budget authority is "gross" and not related directly to the inventory of oil on hand.

* Includes reprogramming, rescission and transfer actions.

** Includes the return of $43,000,000 from the SPR Petroleum Account.

*** Includes $21,585,723 from the SPR Petroleum Account for site maintenance activities.

**** Includes establishment of NGSR.

***** Prior year expansion funds were rescinded in subsequent years.

Strategic Petroleum Reserve Petroleum Account

The SPR Petroleum Account funds the acquisition of oil for the SPR, the associated costs for transportation and terminal expenses, U.S. customs duties, Superfund and Oil Spill Liabilities Trust Fund taxes, and other miscellaneous costs.

During an emergency drawdown and sale, the SPR Petroleum Account is the source of funding for the incremental costs of withdrawing oil from the storage caverns and transporting it to the point where purchasers take title. Receipts from the sale of oil are deposited to the Department of the Treasury and an equal amount of mandatory budget authority is created in the SPR Petroleum Account to be used for sale expenses and to repurchase oil for the SPR.

On April 15, 2014, the Secretary of Energy authorized establishment of the Northeastern Regional Refined Petroleum Product Reserve (NERRPPR), now identified as Northeastern Gasoline Supply Reserve (NGSR), as a component of the SPR. The purpose of the NGSR is to mitigate market disruptions in the mid-Atlantic and New England coastal areas caused by natural disasters. The Congressional Control level was established and $235.6 million was apportioned by the Office of Management and Budget (OMB) in late June 2014 from the SPR Test Sale receipts to establish the NGSR. Oversight and administration of the product acquisition and commercial storage activities will occur for four and half years.

For fiscal year 2014, the capitalized cost of the crude oil in the SPR was $20.5 billion, for an average cost per barrel of approximately $29.73 (excluding storage costs).

Through use of a Royalty-in-Kind (RIK) program, established by the Department of the Interior from April 1999 through December 2009, the cumulative dollar value of the exchange barrels provided to the SPR by contractors who received royalty oil from the Department of Interior totaled $6.1 billion. The value of the RIK oil transferred from the Department of the Interior (DOI) to DOE through 2009, the last year of the program, is shown by fiscal year in Table 10.

Table 10
Value of Royalty-in-Kind Transferred by the Department of the Interior

Fiscal Year	Royalty-in-Kind Transfer * Total Barrels (Source: DOE)	Reconciled Royalty-in-Kind Transfer Total Barrels* (Source: DOE)	Department of the Interior** Forgone Receipts - ($000) (Source: DOI)
1999	11,928,981	8,135,603	***
2000	15,105,558	18,898,937	$560,521
2001	1,568,220	1,568,220	61,654
2002	10,575,379	10,575,378	262,752
2003	34,742,046	34,852,185	1,044,350
2004	35,506,135	35,599,310	1,191,284
2005	25,185,527	25,184,519	1,194,618
2006	0	0	0
2007	8,742,829	4,425,911	306,191
2008	15,943,421	15,943,421	1,600,027
2009	4,493,099	6,798,713	268,537
Total	163,791,195	161,982,197	6,489,934

* In coordination with Minerals Management Service, the DOE completed a total DOE-RIK program reconciliation (1999 – 2009) in CY 2009, requiring net figure adjustments to prior years.
** Net figures that include Department of Interior preliminary volumes and adjustments to prior years.
*** Department of Interior data not available.

Performance Measurement

In fiscal year 2014, the SPR tracked 19 measures that are indicative of how the strategic goals and objectives of the SPR will be pursued. They are consistent with the SPR Strategic Plan, which provides a framework for implementing the program's mission by setting a course for the program and guiding decisions about the effective use of resources. Eighteen of the measures tracked met or exceeded the performance measure, while one measure ("Number of Barrels of Crude Oil Processed") did not meet the target during this period.

- Number of Barrels of Crude Oil Processed – Due to construction delays and plant start-up issues, the degas plant did not commence operations until August 25, 2014, and was not processing at full-rate until August 27, 2014. This resulted in 4.6 MMB degassed versus a target of 16 MMB.

The financial measure of "Operating Cost per Barrel of Storage Capacity" was $0.239 versus a target of $0.25. This is a measure of operational cost-effectiveness and indicates the responsible use of financial resources. This measure is used to promote the efficient use of taxpayer resources provided to operate the SPR.

In fiscal year 2014, the critical performance measures were incorporated into the SPR Annual Operating Plan, in accordance with the Under Secretary for Science's direction. This ensures integration of these critical measures into the planning process and enables tracking of their performance. A complete accounting of the program's measures is reflected in Table 11.

Table 11
Performance Measures

Performance Measures	FY 2013 Actual Performance	FY 2014 Target	FY 2014 Actual Performance
Public Confidence: Oil Inventory, Drawdown Readiness and Distribution			
Number of Barrels of Crude Oil Inventory in Storage	696.0 MMB	691 MMB	691 MMB
90-Day Sustainable Drawdown Rate	4.25 MMB/Day	4.25 MMB/Day	4.25 MMB/Day
Number of Days to Commence Crude Oil Drawdown	13 Days	13 Days	13 Days
Distribution Capability as a Percentage of Drawdown Rate	142%	≥ 120%	128%
Calculated Site Availability	97. 75%	≥ 95%	97.25%
Calculated MPAR Rating	96.45% Cum. Avg	≥ 95% of Possible Points	96.8% Cum. Avg
Percent of Site Security Ratings that are Satisfactory	100%	100%	100%
Number of Barrels of Crude Oil Processed	N/A	16 MMB	4.6 MMB
Excellent Customer Service: Customer Knowledge and Focus			
Percentage of Key Customers Visited	47%	33%	42%
Responsible Stewardship: Operational Effectiveness, Efficiency and Knowledge Management/Fiscal Responsibility and Budgetary Control			
Information System Availability	99.9%	≥ 98%	99.9%
Operating Cost per Barrel of Storage Capacity	$0.239	≤ $0.25	$0.239
Dynamic Teamwork: Continuous Improvement			
ISO 9001-2008 Certification	11/14/2012	Proof of certification within 1 yr of the effective date of the M&O Contract	04/16/14
Partnership Arrangements with Federal, State and Local Agencies			
Number of Partnership Arrangements	12	12	14
Social Responsibility and Citizenship: Local Community Support/Environment, Safety and Health incident rates met?			
Maintain or Apply for OSHA VPP Star Status through completion of an annual self-evaluation or application for each SPR storage fixed site	02/15/2013	Proof of certification within 1 yr of the effective date of the M&O Contract	05/21/2014
Number of Cited Environmental Violations Received	0	0	0
Number of Reportable Releases to the Environment Annually	0	≤ 4	1
ISO 14001 Certification	05/23/2013	Proof of certification within 1 yr of the effective date of the M&O Contract	04/16/2014
Employee Development and Diversity: Employee Development and Quality of Life			
Field Office Recruitment Phases in the Department's Time-To-Hire Model	0%	N/A	N/A
Employee Individual Development Plans (IDPs)	N/A	100%	100%
Site Sustainability Plan Submittal	12/06/12	12/6/13	11/14/2013

MMB = Million Barrels N/A = Not Applicable

XII. Other Program Activities

Northeast Gasoline Supply Reserve

The NGSR consists of contracted storage at multiple facilities in the New York Harbor, greater Boston, Massachusetts, and greater Portland, Maine areas. The SPR does not own storage facilities suitable for the storage of refined petroleum products. It was determined that the benefits of contracting for the storage of up to one million barrels of refined petroleum products pursuant to the authority granted by section 171 of EPCA are comparable to the benefits from a similar action undertaken under Title I, Part B of the statute. It was also determined that the availability of funds in the SPR Petroleum Account would enable the creation of a refined petroleum product reserve in time for the 2014 hurricane season. The contracts require periodic rotation of the refined product to ensure product quality because, unlike crude oil, refined products require periodic turnover to ensure that the products remain within strict quality specifications.

Four storage service contracts were executed to support the establishment of a regional product reserve in the Northeast. The Northeast region of the U.S. is heavily dependent on product supplies from the Gulf Coast, as well as local refining and imports. The crude oil stored in the SPR sites along the Gulf Coast are well suited to mitigating impacts of crude oil supply to refineries. However, vulnerabilities elsewhere in the supply chain could still result in significant regional disruptions. The establishment of a regional product reserve closer to the point of consumption can mitigate the impact of short term disruptions, while issues with the larger supply chain (from crude oil refining through product distribution to consumers) are resolved.

The Department of Energy provides operational oversight of the reserve to include management of the contracts, providing for independent product quality and quantity assurance certifications, performing annual audits, establishment of a sales procedure and platform, and coordination with each of the storage contractors to ensure availability and accessibility of the Government-owned product.

The storage contractors are responsible for maintaining both the quantity and quality of the refined product; this includes any seasonal changeover of products to comply with EPA Clean Air Act requirements. Additionally, the contractors are obligated to ensure that their specific facility is available in the event that a release is required, including the ability to meet the Government's release requirements in the aftermath of an event without commercial electric power. In addition, the contractors are required to provide detailed information on inventories, activities, and distribution capabilities at the request of the Department if conditions exist for a potential release.

Quality and Performance Assurance

The SPR conducted oversight activities as required by DOE procedures. Some of these activities included on-site management appraisals, security surveys, technical assessments, and quarterly review of the management and operating contractor's Contractor Assurance System (CAS).

The CAS covers six oversight areas mandated by DOE O226.1B – Environmental; Safety & Health; Quality Assurance; Security; Emergency Management; and Cyber Security. In addition, CAS has been expanded to also cover Finance, Human Resources, Property, Procurement, Cavern Integrity, Data Systems, Engineering, Operations & Maintenance, and Internal Audit.

The Quality and Performance Assurance Division (QPAD) conducted technical assessments on several key areas within the Management and Operating contractor's (MOC) organization. The assessment of the CAS evaluated the contractor's ability to control and improve their own processes. The assessment on the Quality Management System evaluated the contractor's ability to implement a quality program consistent with an organization certified in ISO 9001:2008. Finally, the assessment of the Subcontract Management Technical Representative program evaluated the MOC's performance in managing their subcontractor's performance. All assessments were conducted to evaluate contractor compliance with oversight requirements in DOE O 414.1D, *Quality Assurance*; and DOE O 226.1B, Implementation of DOE Oversight Policy.

QPAD personnel performed fifteen inspections or site surveillances in 2014 that were recorded onto the Technical Assurance Surveillance Reports (TASR). This included inspections at all SPR sites and supplier/vendor facilities to help ensure construction activities and procedures are followed according to the contract requirements.

Due to a change in operating contactors during fiscal year 2014, the oversight of the Critical Few Performance Measures was completed in 2 separate phases. The first phase (belonging to the out-going contractor) included 23 processes that assessed compliance with SPRPMO O 210.2A. The second phase (belonging to the in-coming contractor) included 8 processes. The assessment of each measure was conducted with a subject matter expert to ensure that the contractor's performance was measured against the objectives, which was appropriately monitored, documented, and verified. Both positive and negative results were submitted to the Performance Fee Board via the board secretary. Once assessment results were complete and documented, a summary report was submitted to the Project Manager and Performance Fee Board Chairperson to determine the amount of fee to be distributed.

In addition, the SPR's Quality Council monitored the activities of four process improvement teams. Those teams, which carried over from fiscal year 2013, worked to identify resources for trench/high angle rescue; develop a process for tracking and reporting contract actions associated with sustainable acquisition; redesign the subcontracting process; and benchmark other DOE organizations for improved Environmental, Safety & Health and Quality Assurance processes or methods. Two other teams were started in fiscal year 2014. Those teams worked to identify methods to capture the unique knowledge and experiences of SPR personnel; and

redesign the availability of resources used by all SPR personnel when evaluating contractor performance.

Executive Orders 13423 and 13514

Over the past decade, two significant Executive Orders have been issued directing Federal agencies to integrate a strategy for advanced technology and environmentally preferable materials, products and services and to strengthen and improve clean energy initiatives, performance metrics, and departmental effectiveness and efficiency.

Executive Order 13423 (January 24, 2007), *Strengthening Federal Environmental, Energy, and Transportation Management,* emphasizes instituting wholesale cultural change for energy and water use and Greenhouse Gas (GHG) reduction. The goals of the Executive Order are for Federal agencies to take the lead in creating a clean energy economy by promoting energy consumption from renewable energy sources and reducing the use of petroleum fuels. Additionally, Federal agencies are to reduce potable water consumption, support sustainable construction, practices, and products, and reduce toxic and hazardous chemical use.

Executive Order 13514 (October 5, 2009), *Federal Leadership in Environmental, Energy, and Economic Performance*, builds on the body of work and success of Executive Order 13423 by integrating and updating previous practices and requirements into a cohesive, strategic approach to further ensure enhanced performance and compliance with statutory and other legal requirements. This order provided detail and direction to all Federal agencies and established the parameters for achieving them.

The intent of both Executive Orders is to create a clean energy economy by use of performance measurements, reporting, direct and indirect activities, and through conservation and protection of natural resources. The SPR's compliance with these orders is achieved through ongoing measurable actions that have been integrated into a Site Sustainability Plan (SSP) that is reviewed and updated annually. The SSP includes specific goals, objectives, and responsibilities to:

- Strive toward reducing the consumption of fossil fuels, through cost-effective projects and operational improvements;

- Continue reviewing on-peak energy demands and aligning operating schedules to coincide with off-peak hours;

- Reduce fleet vehicle greenhouse gas emissions through employing alternative fuel (hybrid) vehicles, optimizing the number of vehicles in the agency fleet, supporting carpooling, and promoting telephone and video conferencing;

- Reduce potable and industrial, landscaping, and agricultural water (ILA) consumption through implementation of reduction awareness programs;

- Reduce waste disposal by supporting on-going recycling and reduction programs and sustainable acquisition;

- Promote electronics stewardship through purchasing Electronic Product Environmental Assessment Tool (EPEAT) registered, Energy Star and Federal Energy Management Program (FEMP) designated equipment, enabling power management, duplex printing, and other energy efficient and environmentally preferable features, and using environmentally sound disposal practices; and,

- Implement environmental protection and damage prevention measures that address economic and social benefits and activities based on lifecycle return on investment.

Implementation of the SSP is supported by the organization of the Sustainability Planning Committee, a team of Federal and contractor personnel who review and propose projects to reduce energy, water and fuel consumption. Data collected during these reviews are used to assess and identify practicable projects, actions, or plans that will allow the SPR to meet its energy, water, and petroleum use goals, while moving to a more healthy and sustainable workplace.

During 2014, several sustainability activities were initiated and others were continued. These activities include:

- Annually "right sizing" the vehicle fleet capacity by evaluating current fleet composition (e.g. vehicle size, number, and types);

- Encouraging teleconferencing to reduce travel by ground and air where practicable;

- Providing electric metering at 13 selected buildings and the ability to monitor energy usage on 83 large pumps;

- Annually conducting an internal energy and water survey at one of the four storage sites - Bryan Mound was surveyed in 2014;

- Installing more energy efficient Light Emitting Diode (LED) and induction lighting in buildings and a well pad;

- Annually updating a building upgrade budget and schedule that addresses energy optimization, equipment life extension, GHG reduction and aging Heating, Ventilation & Air Conditioning (HVAC) and environmental control and air quality replacements;

- Using the "Buy It Green" (BIG) program for selecting environmentally preferable chemicals, products, and materials;

- Minimizing energy consumption by electronics through employing virtual desk top function, thin clients, and power saving and sleep modes; and,

- Dispositioning of all excessed computer ware through reuse or recycling.

Vapor Pressure Mitigation

Reassembly and construction of the portable degasification plant (that had been stored at the Bryan Mound facility since 2011) was completed at the West Hackberry site in 2014. Operation of the West Hackberry degas plant started in August 2014 and continued through December 2014. The degas plant is scheduled to remain at West Hackberry until January 2019 with plans to degas 15 of the 22 West Hackberry caverns during that time.

The need for a continuous vapor pressure mitigation program was recognized in 1992 through routine oil sampling of the caverns. Long-term storage of crude oil in salt caverns results in gradual geothermal heating that raises the temperature of the oil in some caverns from approximately 80°F at the time of injection into the cavern, to a range between 110°F and 130°F over time. In addition, because of operational activities that include occasional injection of raw water into the cavern, gasses encapsulated in the salt are released and absorbed into the oil while stored. Naturally occurring methane gas may also migrate into the cavern through the salt matrix or through discontinuities.

The project degasifies the crude oil so that it can be sold and distributed to customers with a greatly reduced potential for emission of volatile organic compound (VOCs) ozone precursors, benzene, and H_2S. The plant reduces the amount of VOCs in the vapors from the treated oil by 97 percent. Specifically, given lifecycle VOC emissions from the plant averaging about two tons per year, emissions from a single full scale end-of-lifecycle drawdown are reduced by 77,000 tons, or 1,900 times the pollutants generated from operation of the plant over its entire 25 year lifecycle.

International Organization for Standardization (ISO) 14001

In May 2000, the SPR became the first bulk petroleum storage organization, public or private, to receive an ISO 14001, Environmental Management Systems certification. During 2014 the SPR successfully maintained ISO 14001 certification by means of a 3rd Party Surveillance Audit. This certification is valid through April 2015 and is granted to all four SPR storage sites, the New Orleans Headquarters, including the warehouse building and the warehouse facility at the Stennis Space Center.

Environment, Safety, and Health

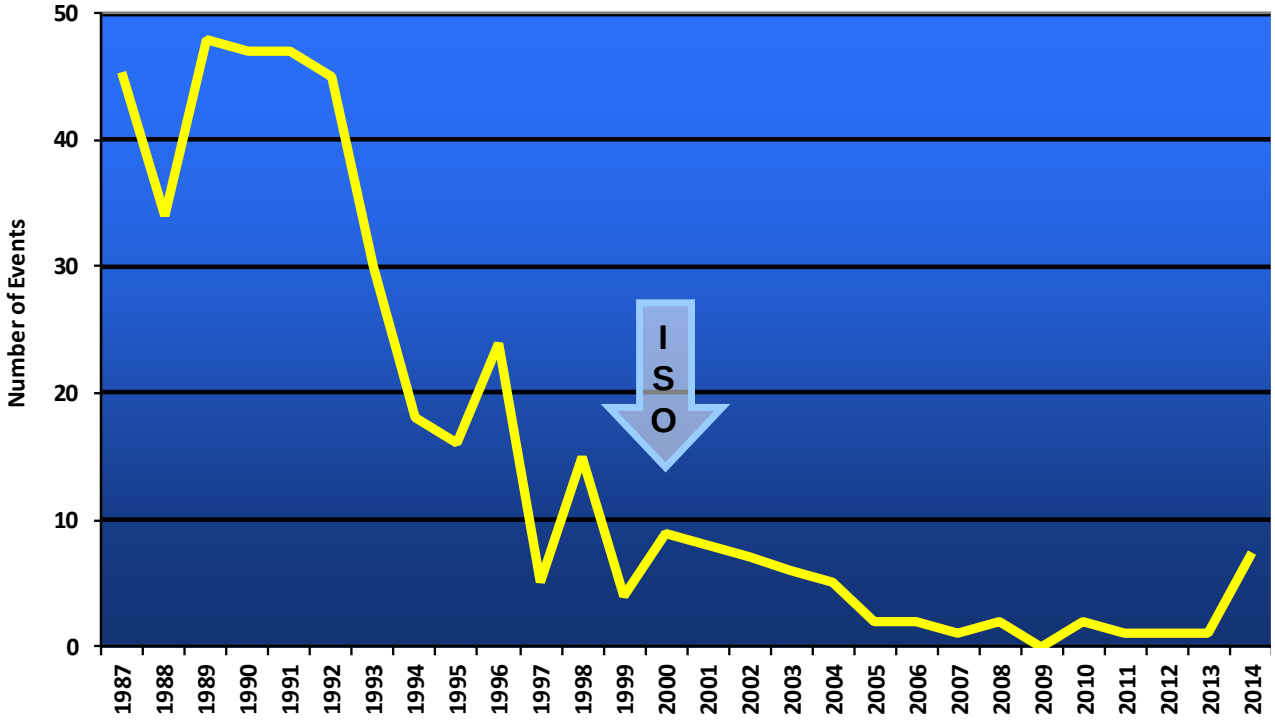
DOE is involved in the Environmental Management System (EMS) through the SPR Integrated Safety Management System (ISM), of which the EMS serves as the environmental leg.

The SPR is accountable to the public for the safe delivery of crude oil during a national energy emergency and is a good steward of the environment. The safety management process is also a leg of SPR ISM. During 2014, all SPR storage sites continued their participation in occupational safety and health programs, including OSHA's Voluntary Protection Program (VPP) as well as DOE's VPP. The Bayou Choctaw storage site was recertified after a five day assessment by OSHA VPP auditors, who included a PSM Compliance Officer. The Bayou Choctaw site also received the Legacy of Stars award from the DOE VPP for sustained excellence in safety performance.

The enterprise risk assessment conducted last year was revised to evaluate the current risk to the total SPR operation, taking into consideration the existing hazard controls and incorporating quarterly reviews.

Figure 7 shows the SPR's performance for recordable environmental incidents from 1993 through 2014. During CY 2014, there were seven recordable environmental incidents. These incidents, one reportable spill, and six permit exceedances occurred over a span of two fiscal years were within the established targets of the fiscal year work authorization directives (WADs).

Figure 6
Annual Summary of Project Events



Pollution Prevention

The SPR sets fiscal year goals for hazardous solid waste, non-hazardous solid waste and construction and demolition debris waste generated at our sites. Fiscal year 2014 was the first year that diversion goals were set. Waste diversion is the prevention and reduction of generated waste. This can be achieved in several ways including source reduction, recycling or reuse. These three waste streams were included based on the guidance in Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance." Executive Order 13514 set solid waste diversion rate goals for all Federal agencies of 50 percent by 2015.

Also in fiscal year 2014, the SPR developed a strategy to reduce municipal solid waste sent to landfills, which in turn provides assistance achieving DOE fiscal year 2020 greenhouse gas reduction targets.

Hazardous Waste

The fiscal year 2014 goal to divert at least 50 percent of hazardous solid waste generated was achieved with a diversion rate of 59.7 percent.

Non-Hazardous Waste

The SPR continued its successful efforts to reduce municipal solid waste by diverting 58.5 percent of non-hazardous solid waste during fiscal year 2014. The goal was to divert at least 50 percent of non-hazardous solid waste.

Construction and Demolition Debris (C&D)

The fiscal year 2014 goal was to divert at least 50 percent of construction and demolition debris waste generated. The SPR successfully met that goal by diverting 97.3 percent of construction and demolition debris waste generated.

Exploration and Production (E&P)

Although there are no specific goals established for Exploration and Production (E&P) waste generation or diversion, the SPR continued with its effort to recycle this waste stream whenever possible. During fiscal year 2014, 65.6 percent of E&P waste was diverted. The generated E&P waste included crude oil contaminated plastic and absorbents, crude oil contaminated solids, workover wastes, off specification crude oil mixtures, and drill cutting wastes.

Environmental Improvement Measures

SPR personnel participated for the 15th year in the annual Lake Pontchartrain Basin Foundation (LPBF) Beach Sweep. The local New Orleans activity is part of a worldwide event promoted by the Ocean Conservancy. Twenty-six employees, their families, and concerned citizens contributed time and effort cleaning debris at an assigned location on the south shore of Lake

Pontchartrain covering an estimated two lineal of shoreline and city street/storm drains, collecting an estimated 250 pounds of trash, documenting 80 man-hours of volunteered time with 15 of those certified as community service hours for area schools.

SPR sites continued to maintain set aside acreage for habitat enhancement for the benefit of both native wildlife and resident and migratory birds.

Throughout the year, educational papers and informative posters that highlight specific wildlife topics are developed and sent to the sites to be posted on the bulletin board. The sites perform avian inventories which are uploaded into the Cornell Laboratory of Ornithology database.

The SPR recognized the 44th anniversary of Earth Day in 2014 as an opportunity for employees to join together and make commitments to environmental sustainability and a global green economy. SPR employees were provided with biodegradable and compostable trash bags to help promote sustainability awareness.

Security and Emergency Operations

The Strategic Petroleum Reserve (SPR) maintained its all-hazards capability to communicate and operate in an all-hazards environment to include firefighting, severe weather, hurricanes, and man-made events. The SPR Continuity of Operations Plan, emergency communications equipment, emergency response vehicles, DOE Emergency Communications Network stand ready for immediate activation and response to ensure the SPR maintains its Mission Essential Functions supporting DOE national-level Essential Functions. The SPR Continuity of Operations Plan was exercised in 2014 with a scenario that allowed senior management to work through an actual Continuity of Operation event.

In 2014, the SPR security program conducted annual Field Training Exercises (FTX) at all four storage sites. These week-long annual site FTX challenged the SPR Protection Force with opposition forces that included the Army Special Forces command exercising with the SPR at two storage sites. This valuable training allows SPR Protection Force Officers to defend the SPR against a wide spectrum of adversaries, equipment and skill sets. The SPR completed a comprehensive Vulnerability Analysis and prepared a Site Security Plan that was approved by the Office of Petroleum Reserves.

During 2014, the four storage sites completed four announced and four unannounced National Preparedness for Response Exercise Plan (PREP) oil spill exercises in support of the Oil Pollution Act of 1990. These exercises include Incident Command System (ICS) activations for command and control, oil containment boom deployments, response and recovery activities with site emergency responders. These PREP exercises include both U.S. Coast Guard and Environment Protection Agency participation as well as oil spill response organizations (OSRO) response.

Safety and Health Improvement Areas

Safety and Health Maintains Best Practice Performance

The SPR continued to improve the safety and health systems throughout the complex during 2014. The accident investigation process was significantly improved using reach-back to the MOC's corporate parent. Trainers were trained to teach CPR, AED use, and First Aid at each of the sites, allowing that training to be moved in-house to an expanded audience for significantly less cost than using a vendor would entail. This also eliminated the need to travel. The same was done with NFPA 70-E 2015, the national electrical code.

During the refurbishment of the DOE workover rig, several changes were made that will reduce the risk of injury significantly and permanently resolve several hazard-related findings.

The MOC also required all of its employees to attend Basic Plus training in safety and health provided by reciprocal safety councils in Texas and Louisiana. This standardizes the basic training, provides proof of training in the form of a card issued by the training organization, and eliminates the need for eleven in-house safety-related training courses. By using training locations near each of the sites, the cost was minimal and one-hour of refresher training is provided annually. A Stop & Think program was also introduced, reminding SPR employees to take some time before performing a task to consider the potential hazards and how to perform it safely.

DOE and Occupational Safety & Health Administration's Voluntary Protection Program

The SPR participates in the OSHA VPP and Process Safety Management (PSM) programs and the DOE VPP. Each site must submit a candid self-evaluation to OSHA and DOE each year, including 20 or more very specific questions about their PSM System. They are also required to maintain ongoing improvements to their safety management system. Recommendations for improvements made during each of the OSHA on-site assessments must be replicated at all of the sites. OSHA VPP representatives and a PSM compliance subject-matter experts conducted intensive on-site assessments of the Big Hill, Bryan Mound, and West Hackberry sites in 2014. The assessments satisfied the 3-5 year re-assessment requirements, but were also conducted to determine if the Star status of the three facilities would be continued under the new MOC. All three facilities were recertified and Bayou Choctaw was recertified based upon its 2013 assessment and its compliance with the same S&H programs. The SPR's heat stress program was identified as a best practice and team members complimented the sites on their PSM compliance programs.

Accident Rates

During CY 2014, the SPR's Total Recordable Case Rate was 1.36 cases per 200 thousand worker hours, which met the SPR's goal of less than 1.40. The Days Away/Restricted/Transferred Case rate was 1.02 per 200 thousand worker hours, which was slightly above the SPR's goal of less than 0.90.

Integrated Safety Management

The SPR completed its annual Integrated Safety Management (ISM) validation and documented its performance in the ISM Annual Review and Update Report of 2014, which summarized the results of all audits and assessments conducted during the fiscal year. The report provides senior management with qualitative and quantitative data verifying that ISM is performing effectively and is used to judge annual ISM performance. During 2014, independent ISM assessment was conducted by a Fluor corporate team, who focused on the five core functions as implemented by the MOC. The assessment found the MOC to be compliant with ISM requirements and provided several opportunities for improvement that are currently underway.

Annual Safety Summit and Tripartite Safety Council

For the past 10 years the SPR has held an annual Management Safety Summit, which in 2011, was expanded to incorporate environmental issues as well. The 2014 Summit included briefings by the safety, health and environmental departments of the MOC and the security contractor. Current issues were briefed and discussed in the open forum.

The SPR also conducted two Tripartite Safety Councils. The purpose of the Council is to give all SPR contractors' representatives an opportunity to address safety issues directly with the SPR Project Manager that have not been resolved through normal channels. Each SPR site, the security contractor, and the A&E contractor have representatives at the meeting. Actions from the Council are tracked to closure.

Business Process Re-Engineering

The SPR information technology function is a national leader in the execution and implementation of re-engineering business process utilizing a combination of Microsoft SharePoint 2010, InfoPath Forms, and K2 workflow engine. System changes include consolidation of several systems into one large data management SharePoint farm.

Data Security, Accessibility, and Resiliency

The SPR has expanded the functionality of its Alternate Data Center, the program's emergency backup information technology system. The enhanced recovery capabilities allows for remotely accessible infrastructure with secure two factor identification, a significant number of portable

computers and Smartphones, and robust backup communications to provide reliable performance in an emergency so that essential work can be performed remotely. Replacement of the elderly Blackberry communications devices are underway with a comprehensive mobile device (smartphones, tablets, laptops) management and data extensibility enhancement to improve user access to SPRO data and usability; and to establish a secure extranet to significantly improve partner and external customer access. The SPR has maintained cyber security success. A Cloud Computing study and trial is underway to determine how best and cost effectively use cloud to improve accessibility and resiliency.

Awards and Certifications

The SPR received the following awards and certifications in 2014 for performance during 2013:

- DOE VPP (Star Among Stars) Superior Star –Bryan Mound.
- DOE VPP Superior Star – Bayou Choctaw.
- DOE VPP Star of Excellence – West Hackberry.
- OSHA Region VI Star of Excellence – Big Hill.
- OSHA Region VI Star among Stars – Bayou Choctaw, Bryan Mound, and West Hackberry.

International Organization for Standardization 9001 Quality Management System

During 2014, Fluor Federal Petroleum Operations maintained their ISO 9001 and 14001 certification.

Customer Service

The SPR's Customer Service Team met with several refiners, traders, pipeline companies, and other customers during the 2014 American Fuel and Petrochemical Manufacturers (AFPM) annual meeting during the third week of March. Additional meetings were held at the SPR offices in Washington, DC, and at some of the customers' corporate offices. Meetings with customers always have two primary functions: to gather customer information to improve the SPR's response capabilities and to update those customers on SPR activities. The customers provided valuable feedback and reported that the overall experience was excellent.

In order to maintain an accurate and current list of customer contacts, each customer was asked to review their contact information and to provide updates on refinery activities such as expansion plans and any planned or actual changes to their crude oil inputs. Customers were also encouraged to discuss any operational or administrative issues they have encountered when dealing with the SPR so that the issues may be addressed.

The Customer Service Team provided updates to the customers regarding the status of the Reserve and welcomed questions from the customers. Customers provided the team with updates on refinery closings, shutdowns, and hurricane upgrades.

Real Estate Actions

During 2014:

- Modification 088 to Interagency Agreement No. DE-AI96-78PO02816 was executed on September 13, 2013, to extend the agreement's period of performance for one year, through September 30, 2014.

- Modification A002 to NASA's Fully Reimbursable Space Act Agreement No. DE-FE-93037 was fully executed on August 28, 2013, to provide annual funding for the Stennis Warehouse through fiscal year 2014.

- Modification M024 to Bryan Mound Pipeline Lease with Exxon/Mobil was fully executed on February 12, 2014, granting an extension of the lease term through May 3, 2020 and providing permanent approval to operate the Jones Creek Pipeline in a bi-directional flow path. This modification also deleted incorporated the document entitled, "Proposed Drawdown Scenarios," dated September 19, 2013. Second Amendment to the Easement and Right-of-Way Agreement between DOE and Exxon/Mobil was fully executed on April 14, 2014, granting the final 5-year option for use of that portion of the leased pipeline on the Bryan Mound Site. This agreement will commence on July 2, 2015 and expire on July 1, 2020.

- The local warehouse at the GSA Harahan Depot was transitioned from a contractor lease to Occupancy Agreements (OA) between DOE and the General Services Administration (GSA). OA No. DE-FE-93058 and OA No. DE-FE-93059, for the warehouse and dog kennel, respectively, were fully executed on behalf of GSA on April 17, 2014. These agreements are valid for a period of 24 months.

- A Right of Entry for Survey and Exploration was executed on April 17, 2014, between CenterPoint Energy and DOE, granting CenterPoint permission to conduct soil boring at the Bryan Mound Site in connection with the 138KV installation.

- Modification A020 to Lease No. DE-RL96-08PO92907 was fully executed August 12, 2014 to provide annual funding and fund the real estate tax charge. This modification further terminated the Source Evaluation Board's temporary off-site expansion space under this lease, retroactively to May 30, 2014.

- FIMS Validations for Buildings, Trailers, and Other Structures & facilities; DOE Owned Land; and DOE Leases were conducted with Fluor Property Section on June 10-11, 2014. Fluor scored GREEN on all three validations.

- Modification A026 to Lease No. DE-RL96-99PO90001 was executed on August 26, 2014, to provide funding on this lease to cover invoiced costs related to performance of an in-line inspection to assess the integrity of the 40-inch Bryan Mound to Texas City Pipeline.

XIII. Conclusion

The SPR continues to prepare for the future, transferring oil from Cavern 20 into Cavern 102 at the Bayou Choctaw site. When complete, this will allow the site to decommission Cavern 20, which has experienced preferential leaching towards the edge of the salt dome. Fill of Cavern 102 allows the site to maintain its drawdown rate for light, sweet crude—which was the most frequently requested type of oil from the SPR following hurricane damage to Gulf Coast refineries. The transfer of crude oil from Cavern 20 to Cavern 102 began in January 2013.

In 2013, access to the sour crude oil inventory in West Hackberry Cavern 6 was considered at risk. Because of this well history and the associated risk, the decision was made to empty Cavern 6 while there is still ready access. The inventory is being transferred to other caverns at West Hackberry.

In 2014, access to the sweet crude oil inventory in Bryan Mound Cavern 2 was considered at risk. Crude oil removal out of Cavern 2 will begin March 2, 2015, as a single closed loop cavern-to-cavern movement. The inventory is being transferred to other caverns at Bryan Mound.

An operational challenge that will impact the SPR's design drawdown capability is the unavailability of one storage tank at Bryan Mound due to a damaged internal floating pan. The tank is used during a drawdown and its loss decreases the drawdown rate at Bryan Mound by 150,000 barrels per day.

In addition to these limitations, DOE has recently recommended upgrading and modernizing the SPR such that effective distribution capability can match physical distribution capability.[5]

Due to the recent changes to interconnected pipeline systems as well as commercial terminal delivery points, a test sale was carried out to evaluate the drawdown and sales procedure capabilities of the reserve in the TEXOMA distribution system. The SPR issued a Notice of Sale on March 12, 2014, setting in motion the drawdown and sales process for the test sale. The SPR initiated crude oil deliveries on March 31, 2014, and completed the final delivery on May 16, 2014. The successful completion confirmed that the SPR maintains a persistent readiness posture to provide crude oil within thirteen days under a competitive sale.

[5] See Department of Energy, "Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure." April 2015.

Appendix: Strategic Petroleum Reserve Site Information

Bryan Mound

Location
Brazoria County, Texas (3 miles southwest of Freeport, Texas).

Site Description
254 million barrel storage facility consisting of 20 caverns.

24 inch diameter, 6 mile brine disposal pipeline extending 4 miles offshore in the Gulf of Mexico.

Oil, brine and raw water piping distribution system connecting caverns with central plant and water intake structure located on Brazos River. Twenty-one (21) pumps totaling approximately 45,000 horsepower.

System Parameters

Drawdown Rate:	(Sour)	1,500,000 BBL/D*
	(Sweet)	1,000,000 BBL/D
Raw Water Pumping Rate:		1,626,000 BBL/D
Oil Fill Rate:		225,000 BBL/D
Brine Disposal Rate:		260,000 BBL/D

*Bryan Mound has 3 storage tanks that are required for site drawdown and refill operations. One tank is currently unusable due to a damaged internal floating pan. The unavailability of the storage tank has reduced the site's actual drawdown capability from 1.5 MMB/D to 1.35 MMB/D.

Distribution Facilities
DOE 3.9 mile, 30-inch pipeline to Seaway Freeport Marine Terminal, DOE 4.0 mile, 30-inch pipeline to Seaway Jones Creek Tank Farm and Pipeline and DOE 46.3 mile, 40-inch pipeline to Seaway Texas City Terminal and Docks.

Acquisition
Acquired 499.47 acres fee simple, through eminent domain, April 1977, from Freeport Mineral Company and other owners. Dow Chemical Company was the previous operator.

West Hackberry

Location
Cameron Parish, Louisiana (25 miles southwest of Lake Charles, Louisiana).

Site Description
227 million barrel storage facility consisting of 22 caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, water intake structure located on Intra-coastal waterway and nine brine disposal wells. Thirty-three (33) pumps totaling over 41,680 horsepower.

System Parameters

Drawdown Rate:	(Sour)	1,300,000 BBL/D*
	(Sweet)	1,300,000 BBL/D
Raw Water Pumping Rate:		1,400,000 BBL/D
Oil Fill Rate:		225,000 BBL/D
Brine Disposal Rate:		225,000 BBL/D

*The drawdown rate is affected due to increased vapor pressure in several of the site's caverns.

Distribution Facilities
DOE 42.8 mile, 42-inch pipeline to Sunoco Nederland Terminal.
DOE 13.6 mile, 36-inch pipeline to Zydeco Pipeline common carrier pipeline system (Lake Charles Meter Station) at Carlyss.

Acquisition
Acquired 405.36 acres fee simple through eminent domain, April 1977, from numerous private landowners. Olin Corporation was the previous site operator. Acquired 160.0 additional acres fee simple by condemnation in two actions, July 1979 and March 1980.

Big Hill

Location
Jefferson County, Texas (26 miles southwest of Beaumont, Texas).

Site Description
170 million barrel storage facility consisting of 14 caverns.

Oil, brine, and raw water systems connecting caverns with central plant, water intake structure located on the Intracoastal Waterway, and a 48-inch diameter, 14-mile brine disposal pipeline extending four miles offshore in the Gulf of Mexico. Forty-eight (48) pumps totaling 46,000 horsepower.

System Parameters

Drawdown Rate:	(Sour)	1,100,000 BBL/D
	(Sweet)	1,000,000 BBL/D
Raw Water Pumping Rate:		1,192,000 BBL/D
Oil Fill Rate:		225,000 BBL/D
Brine Disposal Rate:		232,000 BBL/D

Distribution Facilities
DOE 24.5 mile, 36-inch pipeline to Sunoco Nederland Terminal; Phillips 66 2 mile, 24 inch pipeline to Phillips 66 Docks; Zydeco 20-inch pipeline system to Houma, LA.

Acquisition
Acquired 271 acres fee simple, through eminent domain, November 1982 and July 1983, from three landowners, i.e., 238.48 acres from Amoco, 27.06 acres from the Pipkin estate, and 5.46 acres from the Patrick Henry Phelan estate.

Bayou Choctaw

Location
Iberville Parish, Louisiana (12 miles southwest of Baton Rouge, Louisiana).

Site Description
76 million barrel storage facility consisting of seven caverns.

Oil, brine, and raw water piping distribution system connecting caverns with central plant, a water intake structure, 12 brine disposal wells, and a pipeline for disposing of brine to Boardwalk Louisiana Midstream, LLC (formerly PetroLogistics Olefins, LLC). Eighteen (18) pumps totaling over 18,000 horsepower.

System Parameters

Drawdown Rate:	(Sour)	515,000 BBL/D
	(Sweet)	300,000 BBL/D
Raw Water Pumping Rate:		558,000 BBL/D
Oil Fill Rate:		110,000 BBL/D
Brine Disposal Rate:		110,000 BBL/D

Distribution Facilities
DOE-owned 37.2 mile, 36-inch pipeline to Shell's Sugarland Terminal and Capline Pipeline.
Shell-owned 16 mile, 24-inch pipeline to Baton Rouge.

Acquisition
Acquired 355.95 acres fee simple, through eminent domain, April 1977, from numerous private owners. Union Texas Petroleum (a subsidiary of Allied Corporation) was the previous operator.

In 1985, DOE acquired an additional existing cavern through a cavern exchange agreement with Union Texas Petroleum. The transaction involved a 3.5-acre exchange with no net change in Government-owned acreage.

In November 2011, DOE acquired an existing cavern through eminent domain from Petrologistics Olefins, LLC to replace Cavern 20, which has experienced preferential leaching and is within 60 feet of the edge of the dome, posing an environmental risk with continued use.

List of Acronyms

A&E	Architectural and Engineering
AEO	Annual Energy Outlook
AFPM	American Fuel and Petrochemical Manufacturers
BBLS	Barrels
BIG	Buy It Green
CAS	Contractor Assurance System
C&D	Construction and Demolition
CY	Calendar Year
DOE	Department of Energy
DOI	Department of Interior
E&P	Exploration and Production
EMS	Environmental Management System
EPEAT	Electronic Product Environmental Assessment Tool
EPCA	Energy Policy and Conservation Act
FEMP	Federal Energy Management Program
FY	Fiscal Year
GHG	Greenhouse Gases
GSA	General Services Administration
HVAC	Heating, Ventilation & Air Conditioning
H.J. Res	House Joint Resolution
IDP	Individual Development Plan
ILA	Industrial, Landscaping & Agricultural
ISM	Integrated Safety Management System
ISO	International Organization for Standardization
LCMS	Lake Charles Meter Station
LED	Light Emitting Diode
LPBF	Lake Pontchartrain Basin Foundation
MB	Thousand Barrels
MB/D	Thousand Barrels per Day
MIT	Mechanical Integrity Test
MMB	Million Barrels
MMB/D	Million Barrels per Day
M&O	Management and Operating
NERRPPR	Northeast Regional Refinery Petroleum Product Reserve
NGSR	Northeast Gasoline Supply Reserve
OA	Occupancy Agreement
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
PLM	Plant Lifecycle Module
PSM	Process Safety Management
Pub. L	Public Law

QPAD	Quality and Performance Assurance Division
RIK	Royalty-in-Kind
RPX	Modified Recovery Program
SPR	Strategic Petroleum Reserve
SPRPMO	Strategic Petroleum Reserve Project Management Office
SSP	Site Sustainability Plan
STE	Systems Test Exercise
TSAR	Technical Assurance Surveillance Reports
TBL	Technical Baseline
VOC	Volatile Organic Compound
VPP	Voluntary Protection Program
WAD	Work Authorization Directive

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