U. S. STRATEGIC PETROLEUM RESERVE: RECENT POLICY HAS INCREASED COST TO CONSUMERS BUT NOT OVERALL U.S. ENERGY SECURITY

I. EXECUTIVE SUMMARY

In June 2001, the U.S. Senate Permanent Subcommittee on Investigations, then under the Chairmanship of Senator Carl Levin (now Ranking Minority Member), initiated an investigation into the increased volatility of U.S. retail gasoline prices in recent years. In April 2002, the Subcommittee released a staff report, *Gas Prices: How Are They Really Set?,* and held hearings on retail gasoline pricing and the operation of the gasoline refining and marketing industry. During the course of this investigation, the Subcommittee learned of allegations that the U.S. Department of Energy=s program to fill the U.S. Strategic Petroleum Reserve (SPR) was causing 2002 crude oil prices to rise significantly. The Subcommittee also learned of allegations that certain companies were manipulating crude oil prices on the New York and London futures exchanges. The Subcommittee initiated an investigation into these crude oil pricing issues which affect not only retail gasoline prices, but also prices for other key petroleum products such as home heating oil, jet fuel, and diesel fuel.

As part of its investigative efforts, Subcommittee Minority staff met with the U.S. Department of Energy (DOE), including its SPR Office, the U.S. Commodity Futures Trading Commission (CFTC), and the United Kingdom Financial Services Authority; interviewed representatives from futures exchanges in Chicago, New York, and London, and the Intercontinental Exchange (ICE) based in Atlanta; interviewed crude oil traders and officials from a number of companies that purchase, sell, and trade crude oil; and spoke with oil industry economists, representatives from crude oil price reporting services, and other oil industry experts. The Subcommittee Minority staff also reviewed extensive price and trading data from the New York and London crude oil futures markets; case law and legal analyses related to commodity market regulation and manipulation; numerous academic, economic and industry publications related to crude oil; and documents provided by DOE in response to Subcommittee requests. The Subcommittee Minority staff then prepared this Report describing the findings of the investigation and offering recommendations for corrective action.

A. Findings

Based upon the evidence obtained during its investigation into how recent measures to fill the Strategic Petroleum Reserve (SPR) have affected crude oil markets, the U. S. Senate Permanent Subcommittee on Investigations Minority staff makes the following findings. The findings are organized according to the two major areas of inquiry of this investigation: (1) the filling of the SPR; and (2) the operation of the crude oil markets.

U. S. Strategic Petroleum Reserve

1. **IN 2002, DOE BEGAN TO FILL THE SPR WITHOUT REGARD TO THE PRICE OF OIL.** The SPR Program was established to store petroleum to reduce the adverse economic impact of a major petroleum supply interruption. Following the tragic events of September 11, 2001, in November 2001, President Bush directed the Department of Energy to fill the SPR to its capacity of 700 million barrels in a deliberate and cost effective manner. In early 2002, DOE decided to fill the SPR without regard to crude oil prices. Reversing a longstanding policy of filling the SPR when crude oil prices were relatively low and deferring oil deliveries when prices were relatively high, DOE stopped granting requests to defer SPR oil deliveries. In 2002, DOE deposited about 40 million barrels of oil in the SPR at prices ranging from under $20 to over $30 per barrel.

2. **FILLING THE SPR IN A TIGHT MARKET INCREASED U.S. OIL PRICES AND HURT U.S. CONSUMERS.** DOE ignored warnings by career staff that filling the SPR when oil prices were high and oil supplies were tight could drive oil prices higher and hurt consumers, did not conduct a cost-benefit analysis of the new policy, and did not attempt to estimate or track consumer or taxpayer costs. A Subcommittee Minority staff case study illustrates the high costs of the new SPR fill policy. In late 2001 and early 2002, about 25 million barrels of Brent crude oil were deposited into the SPR despite already tight supplies on world markets. In a one-month period in mid-2002, crude oil price increases caused by SPR deposits spiked the U.S. spot price of home heating oil by 13%, jet fuel by 10%, and diesel fuel by 8%, imposing on U.S. consumers additional crude oil costs of between $500 million and $1 billion. Since then, high crude oil prices have boosted the cost of gasoline, heating oil, jet fuel, and diesel fuel, generating the types of adverse economic impacts on U.S. consumers the SPR program was designed to prevent.

3. **FILLING THE SPR REGARDLESS OF OIL PRICES INCREASED TAXPAYER COSTS.** Prior to 2002, DOE routinely granted oil company requests to defer scheduled oil deliveries to the SPR when near-term oil prices were high, in return for deposits of extra oil at a later date. In 2000 and 2001, DOE used these deferrals to save taxpayers over $175 million and add 7

million barrels to the SPR. By denying deferral requests for most of 2002, DOE missed opportunities for comparable taxpayer savings and extra SPR oil. Also, by using federally-owned oil acquired from offshore oil leases for the SPR instead of selling the oil on the market when prices were high, DOE reduced revenues supporting taxpayer-funded programs. For example, at the 2002 SPR fill rate of 100,000 barrels per day, filling the SPR when crude oil is priced at $30 per barrel rather than $20 per barrel costs taxpayers an additional $1 million per day. Over three months, the additional cost of filling the SPR approaches $100 million, a cost ultimately borne by U.S. taxpayers.

4. **DESPITE ITS HIGH COST, FILLING THE SPR DID NOT INCREASE OVERALL U.S. OIL SUPPLIES.** In 2002, the SPR program put about 40 million barrels of crude oil into the SPR, increasing the total 7%, from about 560 million to 600 million barrels. Removing 40 million barrels from the marketplace, however, increased oil prices which caused U.S. oil refiners to take oil from inventory instead of buying expensive new oil. In 2002, U.S. commercial crude oil inventories dropped 10%, from about 310 to 280 million barrels. In 2003, commercial inventories dropped again to less than 270 million barrels. Today, overall oil supplies in the United States, which consists of oil in the SPR and commercial inventories, total about 870 million barrels, the same amount as at the end of 2001, before the recent SPR fills. Although the SPR program has placed more oil under government control, lower private sector oil inventories mean there has been no net increase in overall national oil supplies.

5. **2003 SPR DELIVERIES WILL DRIVE OIL PRICES HIGHER.** Today, crude oil prices are at a 12-year high, and U.S. commercial crude oil inventories are at record lows, threatening refinery disruptions due to inadequate oil supplies. In these market conditions, unless more oil enters the marketplace, new SPR contracts to remove another 40 million barrels from the U.S. market in 2003, if carried out, will further shrink commercial supplies, drive oil prices higher, and impose more costs on U.S. consumers and taxpayers.

U. S. Crude Oil Markets

6. **U.S. CRUDE OIL FUTURES MARKET NEEDS TO BE IMPROVED.** In 2002, after SPR deliveries removed oil from the marketplace, defects in the New York and London crude oil markets magnified local supply and demand imbalances into large increases in the price of crude oil. Although the London market made major improvements to correct defects in the Brent market, the New York Mercantile Exchange (NYMEX) has not made needed improvements to the WTI futures contract which plays a key role in U.S. crude oil markets.

7. **THE UNAVAILABILITY OF KEY INFORMATION ON OVER-THE-COUNTER TRADING ACTIVITY MAKES DETECTION AND PREVENTION OF PRICE MANIPULATION DIFFICULT, IF NOT IMPOSSIBLE.** Crude oil prices are affected by trading not only on regulated exchanges like the NYMEX, but also on unregulated over-the-counter (OTC) markets which have become major trading centers for energy contracts and derivatives. The lack of information on prices and large positions in OTC markets makes it difficult in many instances, if not impossible in practice, to determine whether traders have manipulated crude oil prices.

B. Recommendations

Based upon the evidence obtained during its investigation and the findings in this Report, the U.S. Senate Permanent Subcommittee on Investigations Minority staff makes the following recommendations.

U.S. Strategic Petroleum Reserve

1. **DEFER 2003 SPR DELIVERIES.** DOE should defer all SPR deliveries scheduled for 2003, until near-term crude oil prices fall and U.S. commercial inventories increase. DOE should publicly announce this policy change to calm markets by making it clear the SPR will not further reduce commercial oil supplies under current market conditions.

2. **CONDUCT COST-BENEFIT ANALYSIS.** DOE should analyze the costs and benefits of the current policy to fill the SPR without regard to oil prices and without deferrals, compared to its prior policy of filling the SPR when oil prices are relatively low and deferring deliveries when oil prices are relatively high or supplies are tight and the contractor agrees to deliver extra oil at a later time. When measuring the benefits, DOE should analyze whether U.S. energy security is better measured by considering only the amount of oil under government control or also the amount of oil in U.S. commercial inventories.

3. **RESTORE MARKET-BASED CRITERIA FOR GRANTING DEFERRALS.** DOE should restore its SPR business procedures allowing deferrals of oil deliveries to the SPR when crude oil prices are high or commercial crude oil supplies are tight, and the contractor agrees to deliver extra oil to the SPR at a later time. DOE should ensure these procedures allow timing SPR deliveries to avoid increased U.S. oil prices, reduced U.S. commercial oil inventories, and added U.S. consumer and taxpayer costs.

U. S. Crude Oil Markets

4. **REVISE NYMEX WTI FUTURES CONTRACT.** The Commodity Futures Trading Commission (CFTC) and NYMEX should work together to revise the NYMEX WTI futures contract to reduce price volatility caused by local supply and demand imbalances in the U.S. WTI market. One option to strengthen price stability is to allow crude oil deliveries under the WTI contract to take place at more locations than the one location now specified at Cushing, Oklahoma.

5. **INCREASE OTC DISCLOSURE.** Congress should authorize the CFTC, which oversees commodity markets, to require traders in OTC markets to provide the CFTC with routine information on large positions in crude oil and energy contracts and derivatives, as well as other information that would aid the CFTC in detecting, preventing, and halting commodity market manipulation.

6. **STRENGTHEN INTERNATIONAL COOPERATION.** The CFTC should strengthen efforts with its counterparts in other countries to implement the Tokyo Communique, including advancing mechanisms to increase reporting of over-the-counter trading positions and coordinating international efforts to detect, prevent, and halt commodity market manipulation.

C. Overview

U.S. Strategic Petroleum Reserve

The United States, which consumes nearly 25% of the 70-80 million barrels of crude oil produced daily worldwide, is by far the largest purchaser and importer of crude oil in the world today. The United States consumes about 18 million barrels each day and imports about 10 million barrels each day to meet approximately 60 percent of its daily needs. Most of this oil, about 90 percent, is refined into fuel products such as gasoline, home heating oil, jet fuel, and diesel fuel. The crude oil market is the largest commodity market in the world, and hundreds of millions of barrels are traded daily in the crude oil spot, futures, and over-the-counter markets. The world's leading exchanges for crude oil futures contracts are the New York Mercantile Exchange (NYMEX) and the International Petroleum Exchange (IPE) in London.

In 2002, the price of crude oil in the United States nearly doubled, climbing from a low of around $18 per barrel in January to a high of $34 per barrel in December. Crude oil prices have continued to climb and recently reached a 12-year high of nearly $40 per barrel.

Several global political events and economic forces were major factors pushing prices upward over this period: the steady erosion of large crude oil supplies that had built up immediately after the terrorist attacks on September 11, 2001; Saddam Hussein's one-month suspension of Iraqi oil exports in April 2002; labor strikes in Venezuela in late 2002 that virtually shut down crude oil production and exports to the United States; U.S. industry's practice of keeping relatively limited crude oil inventories; and increasing speculation and concern over impending war with Iraq.

In addition to these political and economic factors affecting global crude oil supply and demand, a large player entered the crude oil market in late 2001, and significantly affected global crude oil trading throughout 2002. This market player was the U.S. Strategic Petroleum Reserve (SPR).

The purpose of the SPR is to "store petroleum to reduce the adverse economic impact of a major petroleum supply interruption to the United States." Established in 1975, after the oil shortages of the early 1970s, the SPR has enjoyed strong and ongoing support in Congress and subsequent Administrations as a means to strengthen U.S. energy security and protect the U.S. economy from the negative economic consequences of a major oil shortage.

In November 2001, following the tragic events of September 11,th President Bush directed the Department of Energy to fill the SPR to its full capacity of 700 million barrels "in a deliberate and cost effective manner." Very little oil had been added to the SPR since 1995, when the amount of oil in the Reserve totaled about 590 million barrels. Due to several withdrawals since then, the total amount of oil stored in the SPR had declined in 2001 to about 540 million barrels.

In late 2001, when the new policy to fill the SPR to capacity was announced, crude oil prices were low and market supplies were plentiful – favorable market conditions for filling the SPR. As crude oil markets tightened in 2002, however, DOE's determination to direct millions of barrels out of the commercial marketplace and into the federal government's SPR regardless of market conditions became a major factor pushing prices upward and commercial oil inventories downward.

The SPR Office had formerly used a market-based approach to filling the SPR, acquiring more oil when prices were relatively low and less oil when prices were relatively high. This approach took into account market conditions and allowed DOE to fill the SPR without significantly affecting crude oil market supplies or prices. Pursuant to this policy, using procedures most recently published in January 2002, DOE had routinely allowed oil companies to defer scheduled oil deliveries to the SPR when market prices were relatively high in return for providing additional barrels of crude oil at a later time. One month after the deferral procedures were published, however, DOE informed the SPR Office that requests to defer SPR deliveries would no longer be granted. Under this new no-deferral policy, which DOE publicly announced in April 2002, oil was to be deposited into the SPR regardless of the price of oil on the markets.

DOE documents show SPR career officials did not support discarding the market-based strategy they had been using to fill the SPR. SPR career officials accurately warned about the negative consequences of filling the SPR when oil prices were high and oil supplies were tight, predicting it could lead to "explosive price swings," higher trade deficits, and higher costs for taxpayers. SPR career officials also accurately warned that higher prices would cause U.S. refiners to take oil from inventory instead of buying expensive new oil, resulting in lower total U.S. commercial inventories of crude oil. Reducing U.S. commercial crude oil inventories undercuts the fundamental purpose of the SPR program – to ensure this nation has adequate supplies of crude oil in the event of a supply disruption.

One senior SPR career official wrote that the new SPR fill policy "appears irrational to the market place" and "was discredited years ago." He also warned: "Insisting on [SPR] deliveries in a tight market would be heavily criticized as mismanagement and would be difficult to defend."

DOE ignored these warnings and initiated the new SPR fill policy in February 2002, without conducting a cost-benefit analysis or attempting to estimate or track consumer or taxpayer costs. Section IV of this Report provides a detailed case study illustrating the high costs of this new SPR fill policy, which was compounded by the type of crude oil deposited into the SPR. From November 2001 through May 2002, about 25 million barrels of Brent crude oil were deposited into the SPR despite tightening Brent supplies on world markets. Brent crude oil provides a "benchmark" price for the price of two-thirds of the crude oil traded globally, and most of the Brent crude oil produced from March to May was sent to the SPR.

The placement of so much Brent crude oil into the SPR created a shortage of Brent on world markets. This shortage drove up the price of not only Brent, but also other crude oils linked to the price of Brent. These price increases pushed up the cost of crude oil exports to the United States from Europe and Africa.

Due to the increased price, resulting from both tighter market supplies in general and Brent in particular, U.S. refiners bought fewer barrels of expensive imported crude oil, choosing instead to draw down their inventories for refining into gasoline. As U.S. inventories declined, oil companies and traders began bidding up oil prices on the major U.S. crude oil exchange, the NYMEX, in the belief that there was a crude oil shortage in the United States. This trading led to a spike in the price of the principal crude oil traded on the NYMEX, West Texas Intermediate (WTI).

The sudden, sharp increase in the WTI price, which rose 20 percent, or $5 per barrel, from mid-April to mid-May 2002, resulted in the spiking of prices of U.S. fuel products, including the spot price of home heating oil which jumped 13 percent, jet fuel which jumped 10 percent, and diesel fuel which jumped 8 percent. In the span of one month, U.S. consumers and businesses paid additional oil costs of $500 million to $1 billion. Since then, high crude oil prices have continued to boost the cost of gasoline, heating oil, jet fuel and diesel fuel, generating the types of adverse economic impacts on U.S. consumers the SPR program was designed to prevent. These added costs can be viewed, in part, as an "SPR premium" imposed on American consumers by the new SPR fill policy directing crude oil into the SPR regardless of the price of oil.

Filling the SPR regardless of oil prices has not only increased U.S. consumer costs, it has also increased U.S. taxpayer costs. Prior to 2002, DOE routinely granted oil company requests to defer scheduled oil deliveries to the SPR when near-term oil prices are high, in return for deposits of extra oil at a later date. In 2000 and 2001, DOE used these deferrals to save taxpayers over $175 million and add 7 million barrels to the SPR. By denying deferral requests for most of 2002, DOE missed opportunities for comparable taxpayer savings and extra SPR oil. Also, by using federally-owned oil acquired from offshore oil leases for the SPR instead of selling the oil on the market when prices were high, DOE reduced revenues supporting taxpayer-funded programs. For example, at the 2002 SPR fill rate of 100,000 barrels per day, filling the SPR when the crude oil is priced at $30 per barrel rather than $20 per barrel costs taxpayers an additional $1 million per day. Over three months, the additional cost of filling the SPR approaches $100 million, a cost ultimately borne by U.S. taxpayers.

Despite its high cost to U.S. consumers and taxpayers, the new SPR fill policy did not increase overall U.S. oil supplies. In 2002, the SPR program put about 40 million barrels of crude oil into the SPR, increasing the total 7%, from about 560 million to 600 million barrels. Removing 40 million barrels from the marketplace, however, increased oil prices, which caused U.S. oil refiners to take oil from inventory instead of buying expensive new oil. In 2002, U.S. commercial inventories dropped 10%, from about 310 to 280 million barrels. In 2003, commercial inventories dropped again to less than 270 million barrels, which is the lowest level in the United States in 28 years and below the

recognized level at which refinery operations risk disruptions due to inadequate oil supplies. Today, overall oil supplies in the United States, which consist of the oil in the SPR and commercial inventories, total about 870 million, the same amount as at the end of 2001, before the recent SPR fills. Although the SPR program has placed more oil under government control, lower private sector oil inventories mean there has been no net increase in overall national oil supplies.

The benefit to U.S. energy security of shifting oil from private sector control to government control in the SPR, without a net increase in overall oil supplies, is unclear at best, since in the event of a major supply disruption, the SPR would act to release oil on the market, shifting supplies back to the private sector.

Despite spiking U.S. oil prices, shrinking U.S. commercial inventories, and ongoing efforts by SPR career officials to restore the program's earlier market-based approach, DOE kept the SPR no-deferral policy in place throughout most of 2002. In mid-December, DOE granted three requests to defer approximately 15 million barrels of crude oil scheduled for delivery to the SPR from December 2002 through March 2003. DOE stated at the time that the deferrals were granted to avoid "negatively affect[ing] the oil market." In February 2003, however, with crude oil at $35 per barrel, DOE announced three new contracts to deliver another 24 million barrels to the SPR. When added to prior contracts, this announcement means DOE plans to deposit a total of 40 million more barrels to the SPR in 2003. DOE also published an accelerated schedule for these SPR oil deliveries to attain a rate of about 4 million barrels per month beginning in April 2003.

Today, crude oil prices are at a 12-year high, and U.S. commercial inventories are at record lows, threatening refinery disruptions due to inadequate oil supplies. In these market conditions, unless more oil enters the marketplace, DOE plans to remove another 40 million barrels from the U.S. market in 2003, if carried out, will further shrink commercial supplies, drive oil prices higher, and impose more costs on U.S. consumers and taxpayers, without any assurance that expanded overall U.S. oil supplies will result.

Recent SPR fill policy has helped push up U.S. oil prices, reduce U.S. oil inventories, and hurt U.S. consumers and taxpayers. In light of the dubious benefits to national energy security provided by the current SPR fill policy and the high cost to U.S. consumers and taxpayers, this Report recommends: (1) a suspension of all 2003 SPR deliveries until near-term crude oil prices fall and U.S. commercial inventories increase; (2) an analysis of the relative costs and benefits of the new market-blind SPR fill policy compared to the prior market-based policy; and (3) a return to market-based procedures which allow DOE to time SPR deliveries to avoid increased oil prices, reduced U.S. commercial oil inventories, and added U.S. consumer and taxpayer costs.

U.S. Crude Oil Markets

When analyzing the factors influencing crude oil prices in 2002, this investigation also examined the operation of the crude oil markets and their vulnerability to manipulation. As described in Section III, crude oil markets today are far different from the market in the days when the "Seven Sisters" or OPEC ministers met behind closed doors and set crude oil prices worldwide. Although OPEC still plays a major role in determining crude oil prices through production quotas, crude oil prices also respond to the forces of supply and demand as determined by thousands of buyers and sellers in the inter-related spot, futures, and over-the-counter (OTC) commodity markets on which crude oil is traded.

Currently, the U.S. futures markets, such as the NYMEX market for crude oil, are heavily regulated and are among the most transparent commodity markets in the world. Commodity trading on these markets is subject to a variety of reporting requirements and routine market oversight designed to detect and deter fraud and manipulation. This regulation and transparency has bolstered the confidence of traders in the integrity of these markets and helped propel the U.S. into the leading marketplace for many of the commodities traded on these exchanges.

Increasingly, however, OTC crude oil markets, which are essentially unregulated, have become major trading centers and have become intertwined with crude oil trading on the regulated exchanges. Many of the instruments traded in the OTC markets and regulated exchanges are virtually identical, traders often operate in both settings, and both markets handle billions of dollars in commodity transactions daily, providing traders with price discovery and hedging. Prices on one market necessarily affect the price of the same and related commodities on the other market. Indeed, the NYMEX in New York and the IPE in London, two leading crude oil futures exchanges, have integrated their futures trading operations with OTC electronic trading of crude oil contracts, drawing the two types of markets closer together. The NYMEX now operates its own OTC electronic trading facility and even offers a futures contract for trading on its OTC facility, while the IPE was recently purchased by ICE, an OTC electronic trading facility based in Atlanta, Georgia.

The lack of transparency in OTC markets stands in sharp contrast to the transparency of the regulated exchanges. Many OTC trades take place either directly between large traders or through brokers, and there is no reporting of prices or positions to any market oversight body. While some OTC electronic trading facilities, such as ICE and the electronic OTC facility at NYMEX, post bids, offers, and prices electronically, regulators do not have access to other information, such as large trader reports, routinely provided for trading on regulated exchanges. Under current law, OTC market information is available to the CFTC only upon special request, rather than on a routine basis for periodic analysis to detect and deter manipulation. The absence of OTC trading information means, for example, that suspect trading patterns cannot be detected in the OTC markets nor can OTC trading information be compared to information obtained from regulated exchanges. The absence of OTC information makes it nearly impossible

for regulators and market participants to get a full understanding of market behavior in order to detect and deter manipulation.

Because crude oil prices are affected by trading not only on the regulated exchanges, but also on the unregulated OTC markets, this Report recommends increasing OTC information disclosure and market oversight to detect and deter manipulation. This recommendation is consistent with the position taken by the United States in 1997, when the CFTC met with the market regulators from other nations to discuss strengthening the international regime for preventing commodity market manipulation. At the end of this meeting all 17 participating countries, including the United States, issued the Tokyo Communique, which provides guidance and recommendations to improve commodity market surveillance and the sharing of information:

> [I]nformation should be collected on a routine and non-routine basis for on-exchange and related cash and over-the-counter markets and should be designed to assess whether the market is functioning properly. Market authorities should have access to information that permits them to identify concentrations of positions and the composition of the market.

This Report also finds that, in 2002, after SPR deliveries removed oil from the marketplace, defects in the New York and London crude oil futures markets magnified local imbalances between supply and demand into large price effects. Although the London market made major improvements to correct defects in the Brent market to avoid a recurrence of these distortions, the NYMEX has not made needed improvements to the WTI futures contract which plays a key role in U.S. crude oil markets. To minimize U.S. crude oil price distortions, this Report recommends that the NYMEX and CFTC work together to revise the crude oil futures contract traded on the NYMEX to ensure the contract more accurately reflects national, rather than local, crude oil supply and demand, including allowing WTI contract deliveries to take place at more locations than the one location now specified in the WTI contract at Cushing, Oklahoma.

The Report's recommendations for short-term improvements in the SPR fill program and long-term improvements in the crude oil markets are intended to strengthen U.S. energy security, curb the economic damage caused by increasing crude oil prices and tight supplies, and reduce future U.S. vulnerability to possible manipulation of the crude oil markets.