Regulatory Impact Analysis for the Final Amendments to the Oil Pollution Prevention Regulations (40 CFR PART 112)

Volume I

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Acronyms and Abbreviations

AFVO	Animal Fats and Vegetable Oils
API	American Petroleum Institute
AST	Aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
Bbl	Barrel
BLS	Bureau of Labor Statistics
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CBECS	Commercial Buildings Energy Consumption Survey
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
D&B	Dun & Bradstreet
DEC	Department of Environmental Conservation (New York State)
DEQ	Department of Environmental Quality (Virginia)
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
EDG	Emergency diesel generator
EIA	Energy Information Administration
EO	Executive Order
ERS	Economic Research Service (USDA)
FDA	U.S. Food and Drug Administration
FDEP	Florida Department of Environmental Protection
FERC	Federal Energy Regulatory Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FR	Federal Register
FRP	Facility Response Plan
FRS	Facility Registry System
GAO	Government Accountability Office
GIS	Geographic information system
HMA	Hot-mix asphalt
IARC	International Agency for Research on Cancer
ICIS	Integrated Compliance Information System
ICR	Information Collection Request
IDEA	Integrated Data for Enforcement Analysis
IOGCC	Interstate Oil and Gas Compact Commission
IPPA	Independent Petroleum Association of America
IRIS	Integrated Risk Information System
KDH&E	Kansas Department of Health and the Environment
LP	Liquefied petroleum
MDE	Maryland Department of the Environment
MnPCA	Minnesota Pollution Control Agency

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MOU	Memorandum of Understanding
NAICS	North American Industry Classification System
NRC	National Response Center; Nuclear Regulatory Commission
NTTAA	National Technology Transfer and Advancement Act
O&M	Operation and maintenance
OCC	Oklahoma Corporation Commission
OMB	Office of Management and Budget
OPA	Oil Pollution Act
OPEI	Office of Policy, Economics and Innovation
OPP	Oil Pollution Prevention; Office of Pesticide Programs
OSLTF	Oil Spill Liability Trust Fund
PAH	Polycyclic aromatic hydrocarbon
PE	Professional Engineer(ing)
PHMSA	Pipelines and Hazardous Materials Safety Administration
POLREP	Pollution report
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RIA	Regulatory impact analysis
RMA	Risk Management Association
SBA	U.S. Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SIC	Standard Industrial Classification
STI	Steel Tank Institute
SPCC	Spill Prevention, Control, and Countermeasure
USDA	U.S. Department of Agriculture
UST	Underground storage tank
USWAG	Utility Solid Waste Activities Group

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Chapter 1

Executive Summary

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1 Executive Summary

The U.S. Environmental Protection Agency (EPA or the Agency) is amending the Spill Prevention, Control, and Countermeasure (SPCC) rule portion of the Oil Pollution Prevention regulation at 40 CFR part 112. The SPCC rule is the part of the regulation that deals with oil pollution prevention measures and, more specifically, the prevention of oil discharges into navigable waters. The final amendments to the SPCC rule provide increased clarity, tailor requirements to particular industry sectors, and streamline certain requirements for facility owners and operators subject to the rule. While the amendments are not expected to have any impact on environmental protection associated with the rule, the final rule is expected to significantly reduce the burden imposed on the regulated community by the SPCC requirements. Exhibit 1-1 below presents the key amendments by the type of amendments and their impact on cost savings.

Exhibit 1-1
Summary of Key SPCC Rule Amendments

Clarifications *No Impact on Costs*	**Exemptions** *Cost Savings*	**Streamlining Requirements** *Cost Savings*
• Definition of Facility: Non-contiguous parcels can be considered separate facilities • Loading/Unloading Racks: Clarification on the applicability of the requirements • General Secondary Containment: Clarification on the applicability of general secondary containment • Oil and Gas Pipeline Facilities: Clarification of the applicability of SPCC rule on dry gas production facility • Man-made structures: Certain structures can be considered as secondary containment • Wind Turbines: Wind turbines can use alternative compliance option provided for oil-filled operational equipment.	• Hot-mix asphalt tanks • Pesticide application equipment and mix containers • Residential heating oil tanks • Facility Diagram: For portable/mobile tanks, the diagram needs to show only their general area • Loading/Unloading Racks: Onshore production facilities and farms excluded from loading/unloading rack requirements • Certain produced water tanks at oil production facilities • Buried oil storage tanks located at nuclear power plants licensed by NRC	• Tier I qualified facilities can complete and self certify the SPCC Plan Template in lieu of a full SPCC Plan • General Secondary Containment for Non-Transportation-Related Tank Trucks: Exemption from sized secondary containment • Security Requirements: Flexibility to tailor security measures to the facility's specific characteristics and location • Integrity Testing: Flexibility to use specific tank inspection standards on portable containers • AFVO: PE has the flexibility to determine how integrity tested is conducted • Oil Production Facilities: Allow six months after beginning operations to prepare and implement Plans • Oil Production Facilities: Exempt flow-through process vessels from sized secondary containment requirements • Oil Production Facilities: Exempt certain produced water containers and any associated piping and appurtenances downstream of the container from sized secondary containment requirements • Oil Production Facilities: Establish more specific flowline/intra-facility maintenance requirements while exempting them from secondary containment • Oil Production Facilities: Allow certain small production facilities to prepare self-certified SPCC Plan

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Key Amendments to the SPCC Rule

Following is a summary of the key amendments to the SPCC rule:

1. *Hot-mix Asphalt.* EPA is exempting hot-mix asphalt (HMA) containers from SPCC requirements. This material is unlikely to flow as a result of the entrained aggregate, such that there would be very few circumstances in which a discharge of HMA would have the potential to reach navigable waters or adjoining shorelines. EPA is modifying §112.1(d)(2) so that the capacity of storage containers containing only hot-mix asphalt is not counted toward the facility's aggregate oil storage capacity.

2. *Farms.* EPA is exempting pesticide application equipment and related mix containers at farms from SPCC requirements. EPA is also modifying §112.1(d)(2) so that the capacities of these containers are not counted toward the facility's aggregate oil storage capacity. In addition, EPA is clarifying that nurse tanks used on farms are considered mobile refuelers, according to the definition found in §112.2. The Agency is extending the exemption to all pesticide application equipment and related mix containers, regardless of ownership and where it is used.

3. *Residential Heating Oil Containers.* EPA is exempting residential heating oil containers that are used to store oil for the sole purpose of heating a single-family residence (including a residence at a farm) by adding a new paragraph under the general applicability section, §112.1(d). EPA is also modifying §112.1(d)(2) so that the capacity of single-family residential heating oil containers is not counted toward facility oil storage capacity.

4. *Definition of "Facility."* EPA is modifying the definition of "facility" to clarify that contiguous or non-contiguous properties, parcels, leases, and pipelines may be considered separate facilities when calculating aggregate storage capacity to determine applicability of the SPCC rule. This amendment clarifies that facilities are allowed to choose how they aggregate or separate containers stored on contiguous or non-contiguous parcels within their operations. EPA is also specifying that the definition of "facility" definition governs applicability of the SPCC rule to oil and gas production facilities, not the definition of "production facility."

5. *Facility Diagram.* EPA is amending §112.7(a)(3) to clarify that the facility diagram must include all *fixed* (i.e., not mobile or portable) containers. EPA is also requiring that certain containers and piping, exempted from SPCC requirements in this final amendment, be identified on the facility diagram and marked "as exempt." Under this amendment, the facility owner or operator must mark the area on the diagram where the mobile containers are stored, and can choose to indicate in the facility's SPCC Plan the average number of mobile or portable containers maintained at the facility and the anticipated contents and capacities of those containers, rather than on the diagram itself. The revision to the rule language simplifies the development of a facility diagram by allowing for a general indication of the location and contents of numerous mobile or portable oil storage containers (e.g., drums and totes) on the diagram, rather than a specific representation of each container.

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6. *Loading/Unloading Rack.* EPA is establishing a definition for the term "loading/unloading rack" and is specifying that this definition controls applicability of the provision at §112.7(h), *Facility tank car and tank truck loading/unloading rack.* This amendment provides additional clarity to the regulated community about the applicability of this provision to regulated facilities. Furthermore, EPA is specifically excluding all onshore production facilities and farms from the requirements at §112.7(h), because loading/unloading racks are not typically found at production facilities or farms. The SPCC rule already exempts all offshore production facilities from the requirements. EPA also is finalizing editorial revisions to the provision at §112.7(h) for clarity.

7. *Tier I Qualified Facilities.* EPA is streamlining SPCC requirements for Tier I qualified facilities – a subset of Tier II qualified facilities (i.e., facilities less than 10,000 gallons aggregate aboveground storage capacity) having no oil storage containers with a capacity greater than 5,000 gallons. Tier II qualified facilities were addressed in the 2006 amendment to the SPCC rule (71 FR 77266, December 26, 2006).[1] Under this amendment, owners or operators of Tier I qualified facilities are allowed to complete an SPCC Plan template (promulgated as Appendix G to 40 CFR part 112) in lieu of a full SPCC Plan. By completing the SPCC Plan template, an owner or operator of a Tier I qualified facility can self-certify that the facility complies with a set of streamlined SPCC rule requirements.

8. *General Secondary Containment.* EPA is adding clarity by amending the general secondary containment requirement at §112.7(c) in three ways: (1) by adding text regarding the method, design and capacity of secondary containment; (2) by specifically allowing both active and passive measures of secondary containment; and (3) by including additional examples of prevention systems.

9. *General Secondary Containment for Non-Transportation-Related Tank Trucks.* EPA is extending the regulatory relief provided to mobile refuelers in 2006 to non-transportation-related tank trucks at a facility subject to the SPCC rule, because they operate similarly to mobile refuelers.

10. *Security Requirements.* EPA is amending the facility security requirements at §112.7(g) to allow owners and operators of all facilities to tailor security measures to their facility's specific characteristics and location. Under this final amendment, the facility owners/operators are required to describe how they secure and control access to the oil handling, processing, and storage areas; secure master flow and drain valves; prevent unauthorized access to starter controls on oil pumps; secure out-of-service and loading/unloading connections of oil pipelines; and address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharges.

[1] Qualified facilities are those that meet the qualifying criteria: (1) aggregate aboveground storage capacity of 10,000 gallons or less; and (2) no single discharge exceeding 1,000 U.S. gallons or no two discharges each exceeding 42 U.S. gallons within any 12- month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to the SPCC rule.

11. *Integrity Testing.* EPA is amending the integrity testing requirements at §§112.8(c)(6) and 112.12(c)(6) to provide flexibility in complying with bulk storage container integrity testing requirements to extend the streamlined bulk storage container inspection requirement for qualified facilities provided in the December 2006 final rule (71 FR 77266, December 26, 2006) to all facilities subject to the integrity testing provision.

12. *Animal Fats and Vegetable Oils (AFVO).* EPA is amending the requirements found at §112.12(c)(6) to provide the PE or owner/operator certifying an SPCC Plan with the flexibility to determine how integrity testing requirements should be met for eligible containers.

13. *Oil and Gas Production Facilities.* EPA is streamlining requirements specific to this sector. The Agency is modifying the definition of "production facility". EPA is also providing additional clarifications on issues relating to applicability. The other modifications include allowing six months for owners/operators of new facilities to prepare and implement an SPCC Plan; modifying the requirements at §112.9(c) to provide an alternative to the sized secondary containment requirements for flow-through process vessels at oil production facilities while maintaining general secondary containment requirements and requiring additional oil spill prevention measures; providing an exemption for certain intra-facility gathering lines subject to regulatory requirements of the U.S. Department of Transportation's (DOT's) pipeline regulations in 49 CFR parts 192 or 195; and establishing more specific requirements for a flowline/intra-facility gathering line maintenance program while exempting flowlines and intra-facility gathering lines at production facilities from all secondary containment requirements. For produced water, EPA is exempting certain containers and any associated piping and appurtenances downstream of the container from the SPCC requirements when a PE certifies that the contents of the container, if completely discharged, do not contain oil in such quantities that may be harmful, as described in 40 CFR part 110; and for those produced water containers that are not exempt, EPA is allowing general secondary containment with additional requirements rather than sized secondary containment. For small oil production facilities, as defined by a set of new qualifying criteria, EPA is allowing owner/operators of such a facility to prepare a self-certified SPCC Plan rather than a Plan certified by a PE.

14. *Man-Made Structures.* EPA is clarifying that certain man-made structures such as building walls, basement structures, and drainage systems may be considered when determining how to comply with SPCC requirements. If an oil container at a regulated facility is located inside a building, the PE or facility owner/operator certifying the SPCC Plan may take into consideration the ability of the building walls and/or drainage systems to serve as secondary containment for the container.

15. *Underground Emergency Diesel Generator Tanks at Nuclear Power Stations.* EPA is exempting underground oil storage tanks deferred under 40 CFR part 280 that supply emergency diesel generators at nuclear power generation facilities and that are subject to design criteria under the Nuclear Regulatory Commission (NRC) regulations.

16. *Wind Turbines.* EPA is clarifying the applicability of the SPCC rule to wind turbines used to produce electricity; specifically, these wind turbines meet the definition of oil-filled operational

equipment promulgated in the December 2006 SPCC rule amendments (71 FR 77266, December 26, 2006). Therefore, owners and operators of wind turbines can take advantage of the alternative compliance option provided to this type of equipment.

1.1 Baseline for the Analysis

EPA compared the compliance costs for owners and operators of facilities affected by the final amendments to the costs associated with the 2002 SPCC rule revisions. EPA did not have data on which to base an estimate of the proportion of the regulated community currently in compliance. Given the uncertainty, the Agency followed the recommendations presented in EPA's "Guidelines for Preparing Economic Analyses" and assumed that the regulated community is in full compliance with the 2002 SPCC rule amendments.[2]

In response to comments from the Government Accountability Office (GAO), the Office of Management and Budget (OMB), and internally from the EPA Office of Policy, Economics and Innovation (EPA/OPEI), the Agency conducted a sensitivity analysis to examine the impact of various non-compliance assumptions. The first scenario considers the case where there is partial compliance in both the baseline and after the final rule amendments. The second scenario considers the case where there is partial compliance in the baseline and full compliance after the final rule amendments, using the assumption that the final rule amendments would increase compliance by reducing per facility costs and increasing information about the requirements. This sensitivity analysis is conducted for the two key industry sectors affected by the SPCC rule: farms and the oil production and exploration sector. For these sectors, the Agency has some information on the current compliance rates.

Since certain SPCC requirements may be similar in nature to those imposed by state regulations, and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. For details of the state overlap analysis, refer to Section 5.4 of this report. However, due to the lack of data on the extent to which facilities adopt industry standards, the Agency conducted this analysis without accounting for possible overlap of SPCC requirements with industry standards. To the extent that owners and operators of facilities follow industry standards that are equivalent or more stringent than the current SPCC rule requirements, these facilities are not expected to incur any additional cost (or savings) from the SPCC rule and the estimated baseline compliance costs or costs savings are overestimates. If the industry standards are more stringent than the requirements in the amended 2008 SPCC rule, the estimated baseline compliance cost would present an overestimate. If the industry standards are equivalent or less stringent than the requirements in the amended SPCC rule, then the estimates for the cost savings would be accurate, which is the case for the amendments that provide flexibility to facilities to implement the current industry standards to comply with the SPCC rule (e.g., integrity testing, AFVO, security and flowlines for production

[2] U.S. Environmental Protection Agency (EPA). September 2000. "Guidelines for Preparing Economic Analyses".

facilities). For industry sectors that do not have industry standards the baseline compliance cost estimate and the cost savings would not present an overestimate.

EPA obtained the data for the unit cost of compliance with the 2002 SPCC requirements from a PE firm that had experience in preparing and reviewing SPCC Plans and constructing structures to meet SPCC requirements across the 48 contiguous states in the United States and across various industry sectors.[3] In addition, EPA interviewed five regulated facilities to: (1) obtain additional information on activities that facility owners and operators undertake to comply with SPCC requirements and their associated costs, and (2) validate the estimates obtained from the PE firm (see Appendix A in Volume II for more details). EPA also compared the unit costs used in its analyses to similar estimates produced by the U.S. Department of Energy (DOE), the American Petroleum Institute (API), and the Steel Tank Institute (STI) (see Appendix H in Volume II for more details).

1.2 Universe of Affected Facilities

For the purpose of this regulatory impact analysis, EPA used the universe estimates developed for the 2006 SPCC final rule amendments Regulatory Impact Analysis (RIA). EPA estimated the universe of SPCC-regulated facilities in each of 30 industry sectors and four oil storage capacity categories. For 18 of these 30 industry sectors, EPA used state databases that report data on oil storage, handling, and use. For the remaining 12 sectors, federal and proprietary data were used to estimate the number of facilities in the industries with the highest proportion of affected facilities, such as farms and oil and gas production industry.

For the purpose of this regulatory impact analysis, EPA classified facilities into oil storage capacity categories to (1) account for differences in the potential compliance costs incurred by facilities of different sizes; and (2) determine the number of facilities affected by each of the final amendments to the SPCC rule, based on the facility's storage capacity. The four oil storage capacity categories are:

- *Category I:* total oil storage capacity greater than 1,320 gallons but less than or equal to 10,000 gallons;
- *Category II:* total oil storage capacity greater than 10,000 gallons but less than or equal to 42,000 gallons;
- *Category III:* total oil storage capacity greater than 42,000 gallons but less than or equal to 1,000,000 gallons; and
- *Category IV:* total oil storage capacity greater than 1,000,000 gallons.

Exhibit 1-2 summarizes the estimated number of regulated facilities for each size category in the analysis. While these projected estimates are for 2010 (the first year of the analysis period),

[3] SCS Engineers. See Appendix I for detail.

Chapter 6 reports the number of affected facilities for the entire analysis period, 2010 through 2019.[4]

Exhibit 1-2
Estimated Number of Existing SPCC-Regulated Facilities by Size Category (2010)

Size Category	Aggregate Capacity	Estimated Number of Facilities[1]
I	1,320 to 10,000 gallons	318,000
II	10,001 to 42,000 gallons	205,000
III	42,001 to 1 million gallons	115,000
IV	Greater than 1 million gallons	3,000
Total		**640,000**

[1] Individual values may not sum to the total due to rounding.

All the facilities included in the analysis were further divided into two categories: production facilities (facilities whose operations and oil storage activities primarily involve oil and gas production) and storage facilities (all other industry groups). EPA estimated that approximately 215,000 production facilities and 425,000 storage facilities would be subject to SPCC requirements in 2010 (in 2005 the number of SPCC-regulated facilities was estimated to be 571,000). The Agency developed separate estimates for the unit cost of compliance with SPCC requirements for production and storage facilities in Categories I through IV (Chapter 5).

1.3 Baseline Compliance Cost and Cost Savings

EPA estimated the annualized baseline cost of compliance with the 2002 SPCC rule amendments and the compliance cost savings resulting from the 2008 SPCC final amendments using 3 percent and 7 percent discount rates. EPA used the 3 percent and 7 percent discount rates to adjust the estimates for differences in timing, according to OMB Circular A-4.[5] The baseline compliance cost and the cost savings were estimated for each of the 11 issues affected by the final amendments and for those alternative options considered that were expected to have a measurable cost impact[6]:

1. *Hot-mix Asphalt.* EPA estimated the expected cost savings of the preferred option of exempting HMA containers.

2. *Farms.* EPA estimated the cost impact of the preferred option of exempting pesticide application equipment and related mix containers and the alternative option of exempting farms with a certain storage capacity.

[4] The rule is scheduled to be signed and published in October 2008. Regulated facilities have until July 1, 2009 to come into compliance. Thus, the estimated analysis period is 2010-2019. At the time of preparing the RIA report for the 2007 SPCC proposed amendments, EPA did not have information on the exact date the proposed amendments would come into effect and assumed the analysis period from 2008 through 2017. The number of SPCC regulated facilities in 2005 was estimated at 571,000.

[5] "For regulatory analysis, you should provide estimates of net benefits using both 3 percent and 7 percent." OMB, September 17, 2003, OMB Circular A-4, p. 33-34. Available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[6] Only proposed amendments expected to have a cost impact are listed, as opposed to all considered elements presented in the beginning of this chapter.

3. *Residential Heating Oil Containers.* EPA estimated the cost impact of the final option of exempting residential heating oil containers.

4. *Facility Diagram.* EPA estimated the expected cost savings from clarification of the facility diagram requirements.

5. *Loading/Unloading Rack.* EPA estimated the cost impact of a definition of the term "loading/unloading rack."

6. *Tier I Qualified Facilities.* EPA estimated cost savings for streamlined requirements for qualified facilities that have no oil storage containers with a capacity greater than 5,000 gallons. EPA also calculated costs savings for the alternative option of defining qualified facilities as those with total oil storage capacity no greater than 5,000 gallons.

7. *Security Requirements.* EPA estimated the cost savings from allowing owners and operators of all facilities to tailor security measures to their facility's specific characteristics.

8. *Integrity Testing for Small Containers.* EPA estimated the cost savings from allowing facilities to use specific tank inspection standards on portable containers.

9. *Animal Fats and Vegetable Oils.* EPA estimated the cost savings for providing more flexibility on integrity testing for qualified containers.

10. *Oil and Gas Production Facilities.* EPA estimated the cost savings from the preferred and alternative options on five issues—the preferred option of allowing a six-month delay in preparation and implementation of SPCC Plan and the alternative option of allowing a 12-month delay; the option of providing an alternative to the sized secondary containment requirements for flow-through process vessels at oil production facilities and establishing more specific requirements for a flowline/intra-facility gathering maintenance program while exempting them from secondary containment requirements; exempting certain produced water containers and any associated piping and appurtenances downstream of the container from being counted toward facility aggregate capacity and the sized secondary containment requirement and allowing small production facilities to be qualified facilities if they meet certain criteria.

11. *Underground Emergency Diesel Generator Tanks at Nuclear Power Stations.* EPA estimated the cost savings from exempting underground oil storage tanks located at nuclear power plants licensed by the NRC.

In the case of man-made structures and wind turbines, EPA concluded that there would be no cost impact because the Agency's final action only provides a clarification and does not change

the regulatory requirements. Therefore, EPA did not estimate the baseline compliance cost for these issues.

EPA derived these cost savings by estimating the number of facilities affected by each provision of the final rule; identifying the specific behavioral changes that may occur at the affected facilities (e.g., choosing to prepare a self-certified template Plan rather than a full SPCC Plan); estimating the unit costs of the affected compliance measures under the baseline and final regulatory scenarios; and applying the change in costs to the projected number of affected facilities. Total resulting cost savings were annualized over a 10-year period (2010 through 2019) using 3 percent and 7 percent discount rates. The main steps in the analysis are summarized below:

1. *Estimate the universe of facilities affected by the final rule.* EPA first developed a baseline universe of SPCC-regulated facilities by industry sector and range of oil storage capacities. For each major component of the final amendments, EPA then estimated the number of facilities that might be affected by the changes. EPA then projected the anticipated annual change in the number of affected facilities over the 10-year analysis period, using industry-specific growth rates.

2. *Estimate the baseline compliance cost.* EPA developed the baseline compliance cost for complying with the elements of the 2002 requirements that will be *affected by the final amendments.*

3. *Estimate changes in compliance cost elements resulting from the final rule.* EPA estimated the change in behavior resulting from the amendments, and identified the provisions that would result in additional compliance costs and the corresponding unit cost of compliance.

4. *Estimate total reduction in compliance costs (i.e., cost savings) to potentially affected facilities.* EPA estimated the cost savings for owners and operators of each type of affected facility, and multiplied these estimates by the total number of facilities whose owners and operators are expected to take advantage of each regulatory relief option. Finally, EPA estimated the net change in compliance costs and annualized it over a 10-year period using 3 percent and 7 percent discount rates. EPA did not analyze cost savings associated with non-substantive changes to the requirements such as those that only provide additional clarity on the intent of existing SPCC rule requirements.

The cost savings expected from each of these final amendments were calculated from the baseline cost of compliance with the 2002 SPCC rule amendment. The oil production sector and farms would benefit from multiple components of the final rule. Both sectors would benefit from the new requirements for Tier I qualified facilities and amendments to the definition of "loading/unloading rack." In addition to the exemption of pesticide application equipment, farms would benefit from the amendments to the security, integrity testing, facility diagram requirements, and the exemption for single-family residential heating oil containers. The oil

production sector would benefit from amendments specific to the oil production sector, such as the six-month delay in preparation and implementation of SPCC Plans and the exemption of flow-through separation and treating equipment from sized secondary containment requirements, and amendments for small oil production facilities and produced water containers.

Estimated Cost Savings

The total annual cost savings to farm owners and operators are estimated at approximately $13.3 million at the 7 percent discount rate.

As summarized in Exhibit 1-3, at the 7 percent discount rates, the final amendments to the SPCC rule are expected to yield annualized cost savings to farm owners and operators of approximately $4 million from the exemption of pesticide application equipment, $2 million from the exemption of residential heating oil containers, less than $1 million from the clarification to the facility diagram requirements, less than $1 million from the revision to the loading rack definition, $4 million from the streamlined requirements for Tier I qualified facilities, $1 million from the final amendments to the security requirements, and $1 million from the amendments to integrity-testing requirements. The total annual cost savings to farm owners and operators are estimated at approximately $13.3 million at the 7 percent discount rate (see Exhibit 1-3).

Exhibit 1-3
Combined Cost Savings for Farms from the Final Rule Amendments (2007$ Millions)

Rule Component/Scenario	Annualized Cost Savings Discounted at 7% [3]
Farms	
Exempt pesticide application equipment and related mix containers; applicability of mobile refueler requirements to farm nurse tanks	$4
Residential Heating Oil Containers	
Exempt residential heating oil containers	$2
Facility Definition	
Clarify the definition of "facility"	No cost impact
Facility Diagram	
Revise facility diagram requirement	Less than $1
Loading/Unloading Racks[1]	
Exempt farms from loading rack requirement	Less than $1
Tier I Qualified Facilities	
Provide streamlined requirements for Tier I qualified facilities	$4
Security Requirements[2]	
Revise security requirements	$1
Integrity Testing	
Greater flexibility in the use of industry standards for integrity testing requirements	$1
Total	**$13**

1 Midpoint estimate 8% of medium and large farms affected. Cost savings might be higher or lower using different assumptions.

2 Midpoint estimate (50% of farms affected). Cost savings might be higher or lower using different assumptions.

3 Individual values may not sum to the total due to rounding. Cost savings were estimated for both 3% and 7% discount rates (see Chapter 6); for simplicity in presentation only 7% discounted values are presented here.

The total annual cost savings to owners and operators of oil production facilities are estimated at $116 million at the 7 percent discount rate.

As summarized in Exhibit 1-4, at the 7 percent discount rate, the final amendments to the SPCC rule are expected to yield annualized cost savings to oil production facility owners and operators of approximately $2 million from the clarification to the facility diagram requirements, $51 million from the revision to the loading rack definition, $2 million from the streamlined requirements for Tier I qualified facilities, $24 million from the six-month delay in SPCC Plan preparation and implementation, $7 million from the exemption of flow-through process vessels from sized secondary containment, and $30 million for small production facilities with marginal wells. The total annual cost savings to owners and operators of oil production facilities from all of the final amendments that affect this sector are estimated at $116 million at the 7 percent discount rate (see Exhibit 1-4).

Exhibit 1-4
Combined Cost Savings for Production Facilities from the Final Rule Amendments (2007$ Millions)

Rule Component/Scenario[1]	Annualized Cost Savings Discounted at 7%
Facility Definition	
Clarify the definition of "facility"	No cost impact
Facility Diagram	
Revise facility diagram requirement	$2
Loading/Unloading Racks[2]	
Define "loading/unloading rack"	$51
Tier I Qualified Facilities	
Provide streamlined requirements for Tier I qualified facilities	$2
General Secondary Containment	
Final Revisions to the general secondary containment provision	No cost impact
General Secondary Containment for Non-Transportation-Related Tank Trucks	
Extend regulatory relief for mobile refuelers to non-transportation-related tank trucks	No cost impact
Plan Preparation and Implementation	
Six-month delay for Plan preparation and implementation at new production facilities	$24
Flowlines and Intra-facility Gathering Lines	
Exempt flowlines and intra-facility gathering lines from secondary containment	No net cost impact
Flow-Through Process Vessels	
Exempt flow-through process vessels from sized secondary containment	$7
Marginal Production Facilities	
Streamline certain requirements for marginal production facilities	$30
Produced Water Containers	
Exempt produced water storage containers and any associated piping and appurtenances	No cost savings estimated
Total	**$116**

1 Cost impacts are presented by rule component; impacts across industries are not separated out. See Section 6.2 for aggregate cost effect on farms and Section 6.13 for aggregate cost effect on the production sector.

2 Midpoint estimate (17% of oil production facilities affected). Cost savings might be higher or lower using different assumptions.

The total cost savings across all the final amendments to the SPCC rule are expected to yield annualized cost savings of approximately $176 million.

Exhibit 1-5 summarizes the cost savings expected from each of the final amendments. At the 7 percent discount rate, they range from an annualized savings of less than $1 million (exempting buried oil storage tanks at nuclear power plants) to $51 million (definition of loading/unloading racks). The total cost savings across all the final amendments to the SPCC rule are expected to yield annualized cost savings of approximately $176 million, at the 7 percent discount rate. These estimates are not necessarily additive, given that they do not account for interactions among the various components of the amendments; therefore, the total cost savings presented in Exhibit 1-5 could be an overestimate or an underestimate depending on how the various components interact with each other.

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Exhibit 1-5
Summary of Estimated Cost Savings Associated with the Final Amendments (2007$ Millions)

Rule Component/Scenario[1]	Annualized Cost Savings Discounted at 7%
Hot-mix Asphalt	
Exempt HMA containers	$8
Farms	
Exempt pesticide application equipment and related mix containers; applicability of mobile refueler requirements to farm nurse tanks	$4
Residential Heating Oil Containers	
Exempt residential heating oil containers	$2
Facility Definition	
Clarify the definition of "facility"	No cost impact
Facility Diagram	
Revise facility diagram requirement	$3
Loading/Unloading Racks[2]	
Define "loading/unloading rack"	$51
Tier I Qualified Facilities	
Provide streamlined requirements for Tier I qualified facilities	$24
General Secondary Containment	
Final revisions to the general secondary containment provision.	No cost impact
General Secondary Containment for Non-Transportation-Related Tank Trucks	
Extend regulatory relief for mobile refuelers to non-transportation-related tank trucks	No cost impact
Security Requirements	
Revise security requirements[3]	$9
Integrity Testing	
Greater flexibility in the use of industry standards for integrity testing requirements	$11
Animal Fats and Vegetable Oil	
Amend integrity testing requirements for AFVO containers that meet certain criteria[4]	$2
Oil Production Facilities	
Six-month delay for Plan preparation and implementation	$24
Exempt flowlines and gathering lines from secondary containment	No net cost impact
Flow-through process vessels	$7
Streamlined requirements for small production facilities with marginal wells	$30
Exempt produced water storage containers and any associated piping and appurtenances	No cost savings estimated
Man-Made Structures	
Consider man-made structures in determining SPCC rule applicability	No cost impact
Nuclear Power Stations	
Exempt underground oil storage tanks at nuclear power generation facilities	Less than $1
Wind Turbines	
Clarify applicability of the rule to wind turbines used to produce electricity	No cost impact
Total	**$176**

1 Cost impacts are presented by rule component; impacts across industries are not separated out. See Section 6.2 for aggregate cost effect on farms and Section 6.13 for aggregate cost effect on the production sector.
2 Midpoint estimate (17% of oil production facilities, 50% of AFVO facilities, and 8% of medium and large farms affected). Cost savings might be higher or lower using different assumptions.
3 Midpoint estimate (50% of farms affected). Cost savings might be higher or lower using different assumptions.
4 Midpoint estimate (65% of facilities affected). Cost savings might be higher or lower using different assumptions.

1.4 Impacts on Human Health, Welfare and the Environment

The principal effect of the final amendments is lower compliance costs for owners and operators of certain types of facilities due to modifications in the spill prevention measures they are required to implement. EPA believes that the rule amendments protect the environment and, at the same time, provide the opportunity for regulated facilities to reduce the cost of SPCC compliance. Throughout the process of developing these amendments, EPA has relied on its own technical staff, including Regional inspectors, and outside consultants to identify changes that would reduce the burden of the regulations while maintaining the same or nearly the same level of protectiveness. For example, one final amendment provides a Professional Engineer (PE) with some flexibility in certifying an SPCC Plan applicable to integrity testing requirement for containers at AFVO facilities. The only containers eligible for this flexibility are self-draining, stainless steel containers that store refined food oil intended for human consumption and satisfy other criteria such as compliance with 21 CFR part 110. These criteria ensure that the container would be corrosion-resistant and are equivalent in discharge prevention to integrity testing. In addition, the amendment requires a PE to determine that the flexibility is warranted. In the absence of quantitative data, EPA qualitatively assessed the change in threat of discharge and believes that the final rule amendments will maintain environmental protection.

1.5 Small Entity Impact and Executive Orders

EPA considered whether the amendments to the SPCC rule impact the financial condition of small entities, as required by the Regulatory Flexibility Act (RFA)[7] and Small Business Regulatory Enforcement Fairness Act (SBREFA).[8] In addition, the analyses required under Executive Order (EO) 13132–Federalism[9]; EO 13175–Consultation and Coordination With Indian Tribal Governments[10]; EO 13045–Protection of Children From Environmental Health & Safety Risks[11]; EO 13211–Actions That Significantly Affect Energy Supply, Distribution, or Use[12]; the National Technology Transfer and Advancement Act (NTTAA); and the Paperwork Reduction Act (PRA)[13] were conducted.

Small Entity Impact. RFA, as amended by SBREFA, requires federal agencies to determine whether their regulatory actions will have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities. Thus, the Agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

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7 5 U.S.C. Sec. 603; 5 U.S.C. Sec. 604.
8 Public Law 104-121, March 29, 1996.
9 64 FR 43255, August 10, 1999.
10 65 FR 67249, November 9, 2000.
11 62 FR 19885; April 23, 1997.
12 66 FR 28355, May 22, 2001.
13 44 U.S.C. Sec. 3501.

The final amendments to the SPCC rule will reduce the burden on small businesses, and will not increase the cost for any small entity since the businesses will be eligible for tailored reduced regulatory requirements, such as those offered to production facilities, facilities that store or handle animal fats and vegetable oils, Tier I qualified facilities, and others. Because the SPCC rule categorizes affected entities based on oil storage capacity, while the U.S. Small Business Administration (SBA) defines small businesses based on the business' total number of employees or total annual revenue, EPA does not know how many SPCC-regulated facilities are also SBA-defined small businesses.[14] Nevertheless, given their resource constraints, owners and operators of small businesses are likely to take advantage of, and benefit from, the regulatory burden relief offered by the final amendments.[15]

Executive Order 13045 – Protection of Children from Environmental Health & Safety Risks. EPA expects that the rule amendments will not have a disproportionate adverse effect on children nor adversely affect a large number of children (EO 13045). EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This rule amendment is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

Executive Order 13211 – Actions That Significantly Affect Energy Supply, Distribution, or Use. In response to EO 13211, EPA concludes that since the final amendments to the SPCC rule reduce the burden on owners and operators of regulated facilities; EPA does not expect an adverse impact of the rule on energy supply, distribution, or use.

Executive Orders 13132 and 13175 and National Technology Transfer and Advancement Act. EPA concludes that the rule amendment does not have federalism implications; therefore, EO 13132 does not apply to this action. In addition, it does not significantly or uniquely affect communities of Indian tribal governments; thus, EO 13175 does not apply to this action. EPA also concludes that the NTTAA does not apply because the rulemaking does not set or incorporate by reference any one specific technical standard.

Paperwork Reduction Act. Agencies must provide information to OMB on the parties affected, the annual reporting burden, and the annualized cost of responding to the information collection. The SPCC rule (40 CFR part 112) requires and establishes procedures for the preparation and implementation of SPCC Plans. Owners and operators of regulated facilities must prepare SPCC Plans in accordance with good engineering practices and have them approved by a person with the authority to commit the

> *The final amendments will reduce the reporting and recordkeeping burden by 1.3 million hours and capital, operating and maintenance (O&M) costs by $43 million.*

[14] According to the economic analysis of the 2002 SPCC final rule, EPA estimated that 94 percent or more of the total number of SPCC-regulated facilities were also SBA-defined small businesses. U.S. EPA, May 2002, "Economic Analysis for the Final Revisions to the Oil Pollution Prevention Regulation (40 CFR part 112).

[15] This assumption is consistent with an earlier study of PE certification cost impacts on small businesses conducted by the SBA: Jack Faucett Associates for SBA Office of Advocacy, June 2004, "Proposed Reforms to the SPCC Professional Engineer Certification Requirement: Designing a More Cost Effective Approach for Small Facilities."

resources necessary to implement the SPCC Plan. EPA estimates that approximately 640,000 facilities will incur paperwork-related burden in the first year of the Information Collection Request (ICR) and estimates the total reporting and recordkeeping burden for these facilities at approximately 7.1 million hours in each year of this ICR. The Agency estimates that as a result of the final amendments to clarify and streamline certain SPCC requirements, the reporting and recordkeeping burden will decrease by 1.3 million hours. The final rule amendments would reduce capital and operating and maintenance costs by approximately $43 million on an annualized basis.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. The overall effect of the action is to decrease the regulatory burden on facility owners or operators subject to its provisions.

1.6 Sensitivity Analyses

This regulatory impact analysis estimates the cost savings resulting from the final rule amendments compared to a baseline, which assumes full compliance with the SPCC rule requirements under 40 CFR part 112, as amended in 2002 (67 FR 47042). The cost savings may in fact be greater or lower (for details see Chapter 9).

EPA is aware of industry concerns regarding non-compliance (both now and after the amendments are finalized) among owners and operators of facilities of certain sizes or industry sectors. Although no statistically valid data exists to assess the extent or magnitude of such non-compliance, inspections by EPA regions have found non-compliance in the SPCC regulated community. In response to comments from the Office of Management and Budget (OMB), the Government Accountability Office (GAO), and the EPA Office of Policy, Economics and Innovation (EPA / OPEI), EPA conducted sensitivity analysis to examine the impact of various non-compliance assumptions. The sensitivity analysis considered two scenarios. In the first scenario EPA considered partial compliance in the baseline and full compliance after the final rule amendments, and included an estimate of the cost of compliance incurred by facilities that would come into compliance during the analysis period. In the second sensitivity analysis scenario, EPA considered partial compliance both in the baseline and after the final rule amendments (i.e., the partial compliance rate did not change between the baseline and the post-rule period in this scenario).

Estimated Change in Cost Savings for the Alternative Baseline

This alternative analysis presents cost saving estimates for owners and operators of facilities resulting from the final rule assuming partial compliance (25 percent, 50 percent, or 75 percent compliance) with both the 2002 and 2008 final rule amendments. In other words, these scenarios assume that 75, 50, or 25 percent of the facilities, respectively, are not in compliance

with the current rule, would not do anything different under the amendments, and would not incur any cost savings.[16]

Under the partial compliance scenarios, anticipated cost savings would be less than the total cost savings presented in the primary regulatory impact analysis in direct proportion to the assumed compliance rates. There is less cost savings under those scenarios because the fraction of SPCC-regulated facilities whose owners and operators are assumed to be in non-compliance would not be affected by the rule changes, and would not be able to lower their costs. The estimated cost savings under the three partial compliance scenarios are presented in Exhibit 1-6.

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[16] See Appendix B for results and further details on the sensitivity analysis.

Exhibit 1-6
Annualized Cost Savings Associated with the Final Rule under Partial Compliance Scenarios (2007$ Millions)

Final Rule Component[1]	Partial Compliance in the Baseline and after the Final Rule (25%, 50%, 75%)								
	25% Compliance			50% Compliance			75% Compliance		
	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted
Exempt Hot-mix Asphalt Containers	$2.10	$2.09	$2.09	$4.19	$4.19	$4.18	$6.29	$6.28	$6.27
Exempt Pesticide Application Equipment	$0.890	$0.891	$0.892	$1.78	$1.78	$1.78	$2.67	$2.67	$2.68
Exempt Residential Heating Oil Containers	$0.577	$0.578	$0.579	$1.15	$1.16	$1.16	$1.73	$1.73	$1.74
Facility Diagram	$0.843	$0.838	$0.830	$1.69	$1.68	$1.66	$2.53	$2.51	$2.49
Loading/Unloading Racks[2]	$13.0	$12.9	$12.7	$25.9	$25.7	$25.4	$38.9	$38.6	$38.1
Tier I Qualified Facilities	$6.07	$6.03	$5.98	$12.1	$12.1	$12.0	$18.2	$18.1	$17.9
Security Requirements[3]	$2.35	$2.33	$2.31	$4.69	$4.66	$4.62	$7.04	$6.99	$6.93
Integrity Testing	$2.81	$2.79	$2.76	$5.61	$5.57	$5.53	$8.42	$8.36	$8.29
Animal Fats and Vegetable Oils[4]	$0.483	$0.482	$0.482	$0.966	$0.965	$0.963	$1.45	$1.45	$1.45
Oil Production: Six-Month Delay for Plan Preparation and Implementation	$6.06	$6.02	$5.96	$12.1	$12.0	$11.9	$18.2	$18.1	$17.9
Oil Production: Exempt Flow-through Process Vessels from Secondary Containment	$1.84	$1.83	$1.81	$3.68	$3.66	$3.62	$5.52	$5.48	$5.43
Oil Production: Streamlined Requirements for Small Production Facilities with Marginal Wells	$7.63	$7.56	$7.48	$15.3	$15.1	$15.0	$22.9	$22.7	$22.4
Exempt Underground USTs at Nuclear Power Generation Facility	$0.000507	$0.000484	$0.000452	$0.00101	$0.000968	$0.000904	$0.00152	$0.00145	$0.00136
Total	**$44.6**	**$44.3**	**$43.9**	**$89.2**	**$88.6**	**$87.8**	**$134**	**$133**	**$132**

1 Impacts are presented for preferred options by rule component; impacts across industries are not separated out.
2 Midpoint estimate (17% of oil production facilities, 50% of AFVO facilities, and 8% of medium and large farms affected). Cost savings might be higher or lower using different assumptions.
3 Midpoint estimate (50% of farms affected). Cost savings might be higher or lower using different assumptions.
4 Midpoint estimate (65% of facilities affected). Cost savings might be higher or lower using different assumptions.

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1.7 Key Assumptions and Limitations

According to Executive Order 12866,[17] agencies are required to assess all costs and benefits of regulatory activities, including quantitative and qualitative measures. The Executive Order also requires assessment of all benefits and costs including, but not limited to, those related to the environment, public health and safety, distributive impacts, and issues of equity.

This regulatory impact analysis estimates the cost savings that accrue to owners and operators of facilities from reductions in compliance costs resulting from the final amendments to the rule. In addition, the Agency considered whether the streamlined requirements in the final rule might affect human health, welfare, and the environment. In the absence of quantitative data, EPA qualitatively assessed the change in threat of discharge and believes that the final rule amendments will maintain environmental protection.

Many of the assumptions, as well as the estimates of unit cost savings and the number of affected facilities, presented in this RIA are inherently uncertain. EPA made the best use of the available data to make informed decisions regarding the assumptions used in the analysis. To address major uncertainties involved in estimating the total cost savings from the final amendments, the Agency used a sensitivity analysis approach to estimate the range of cost savings by examining up to three scenarios for several components of the final rule (e.g., final amendments to the loading rack definition, security requirements, and flexibility for AFVO facilities).

It is important to note that the baseline estimate for the number of SPCC-regulated facilities does not take into account a possible change in behavior of facility owners and operators with respect to redefining their facility boundaries when the facility is located on multiple, non-contiguous parcels. EPA recognizes that the baseline estimate for the number of SPCC-regulated facilities and the baseline compliance cost are likely to represent an overestimate. The Agency potentially overestimates the regulated universe because facility owners and operators might have redefined their boundaries and divided the parcels in order to reduce regulatory burden. This behavioral change would reduce the number of regulated facilities, leaving a certain number of facilities outside of the SPCC universe. Facilities in the following industries are expected to be most affected by this rule flexibility: farms, large oil production facilities, military bases, airports, and large universities.

1.7.1 General Assumptions and Limitations

Assumptions

EPA made four major assumptions in the analysis. First, the Agency assumes that cost minimization behavior applies to all owners and operators of facilities that qualify for reduced regulatory requirements, whereby all those eligible would take advantage of burden relief. Second, EPA assumes that all existing owners and operators of facilities are in full compliance with the July 2002 amendments to the SPCC rule (67 FR 47042). It is important to note that

[17] 58 FR 51735, October 4, 1993.

insofar as certain owners/operators of facilities are not in compliance with the 2002 rule because of the compliance date extension (July 1, 2009), this assumption may imply that cost savings are an under-estimate. Third, EPA assumes that owners and operators of existing SPCC-regulated facilities would forgo compliance activities offered as alternatives to activities that required one-time initial investments because they would have already incurred the one-time cost. For example, EPA assumes that an owner or operator of an existing facility who would qualify for reduced security requirements under the final rule, which allows facility owner/operators to tailor their security measures to the facility's specific characteristics and location, would have already provided the security measures as per the 2002 rule amendments or demonstrated environmental equivalence for tailored security measures. Thus, owners and operators of existing facilities would not take advantage of the provided alternative, while owners and operators of new facilities would. Fourth, EPA assumes that compliance is nationally consistent despite variability in state regulations and the distribution of affected facilities. In addition, EPA made several assumptions when estimating the cost savings for the different options. These are described in greater detail in Chapter 8.

Limitations

One of the main limitations of this regulatory impact analysis is EPA's lack of data on the number of facilities regulated under the SPCC program. The rule does not include a notification requirement and, with certain exceptions, regulated entities do not need to submit any information to EPA. The absence of notification data means that, without conducting a statistically valid survey, EPA is limited to data already collected by state or federal agencies or by proprietary sources. Such data are collected for diverse purposes and are not ideal for identifying SPCC-regulated facilities, as the data do not normally provide information on smaller storage tanks or non-petroleum oils. Because the collected data omit certain portions of the regulated universe or lack detail about certain facility characteristics, the evaluation of regulatory options using those data involves substantial uncertainties. Additional uncertainty is introduced in the estimate for the SPCC-regulated facilities because of lack of information on how owners and operators would use the flexibility to define the facility boundaries for contiguous and non-contiguous parcels.

Compliance costs incurred by owners and operators of facilities in the baseline depend not only on the volume of oil stored and handled, but also on the types of oil at a site, the number of tanks (and their capacity), and the locations of the tanks across the site. Given the wide range of industries and facility sizes affected by the SPCC rule—as well as geographical and climatic conditions that affect a facility's configuration and operation patterns—a realistic baseline against which regulatory changes are measured cannot be reliably determined. Therefore, uncertainty is involved in estimating the changes in compliance costs that could occur under the final regulatory actions.

Another major limitation concerns many of the cost estimates used in the analysis, which are based on the expert opinion of a professional engineering firm and on interviews with a limited

number of regulated facilities.[18] The data provided by the PE firm represent informed professional judgment based on the firm's service to the 48 contiguous states, but are not statistically representative of the entire country. Therefore, extrapolation to a larger universe provides only approximate estimates of costs and does not represent the actual costs incurred by facilities of different types and sizes. In addition, the PE firm personnel were hesitant to provide "typical" costs when the costs of compliance depend significantly on site-specific factors. Ideally, a regulatory analysis would explicitly account for such variability in costs. However, in this analysis EPA was unable to differentiate compliance costs due to the lack of information on the site characteristics of facilities affected by the final SPCC rule.

In addition, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards.

EPA did not have quantitative data on the number of regulated facilities that use in-house professionals to design and implement SPCC compliance measures versus the facilities that primarily hire an outside contractor for those tasks. Site visits suggested that in any size category there are facilities that use in-house labor as well as facilities relying on outside engineering firms. Therefore, when estimating per-facility costs of compliance, EPA used the assumption that within each size category 50 percent of facilities would use in-house labor and 50 percent of facilities would hire a PE firm.

Furthermore, the cost of compliance was calculated for each of the amendments separately, assuming that there were no changes in other aspects of the rule. Therefore, the analysis does not take into account the ways in which different amendments interact with each other and how these possible interactions might reduce or increase the total cost. Consequently, the cost changes from each amendment cannot be added to produce the aggregate effect of the final amendments without double counting.

Finally, the Agency did not calculate a final cost of compliance with the SPCC rule that adds the cost savings from the 2006 final amendments with the cost savings from 2008 final amendments.

[18] SCS Engineers provided detailed estimates for the cost of compliance for each of the SPCC requirements. Interviewed facilities include entities within the following industries: oil bulk storage and distribution, chemical manufacturing, oil production, petroleum refinery, and asphalt production (see Appendix A).

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Chapter 2

Introduction

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2 Introduction

The Environmental Protection Agency (EPA or the Agency) is amending the Spill Prevention, Control, and Countermeasure (SPCC) requirements of the Oil Pollution Prevention regulation at 40 CFR part 112. These amendments are intended to address several areas in order to provide increased clarity, tailor requirements to particular industry sectors, and streamline certain requirements for facility owners and operators subject to the rule. The regulatory changes significantly reduce the burden imposed on the regulated community when complying with the SPCC requirements. In addition to the final amendments, EPA is providing clarification regarding several additional issues raised by the regulated community.

The final amendments provide relief to owners and operators of affected facilities from certain regulatory mandates, and could change the manner in which they comply with other, still applicable mandates. Under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993), EPA must determine whether a regulatory action is “significant” and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. Under the terms of Executive Order 12866, this action has been judged a “significant regulatory action” because it will have an annual effect on the economy of $100 million or more. The order defines “significant regulatory action” as one that is likely to result in a rule that may do one or more of the following:

1. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

4. Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the Executive Order.

Once an action is deemed subject to Executive Order 12866, agencies are required to assess all costs and benefits of regulatory activities, including quantitative and qualitative measures. The Executive Order also requires assessment of benefits and costs, including but not limited to those related to the environment, public health and safety, distributive impacts, and issues of equity. This action will be submitted to OMB for review, and the Agency prepared this regulatory impact analysis (RIA) in support of the regulatory requirements.

This RIA provides an estimate of reduced compliance costs for owners and operators of certain types of facilities and equipment as a result of the amendments to the rule. EPA believes that

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the rule amendments protect the environment; therefore this analysis primarily focuses on estimating the incremental change in compliance costs as a result of the final rule amendments. Therefore, this report is in compliance with the Executive Order 12866.

Many of the assumptions underlying this analysis are inherently uncertain, as are the estimates of unit cost savings and the number of affected facilities. While EPA did not have statistically significant samples of data for various components of the analysis, the Agency has made the best use of the available data to make informed decisions regarding the assumptions and estimates used in the analysis.

EPA has received a number of comments on the rule revisions proposed in 2007 from regulated parties, professional associations, environmental interest groups, and others. Aside from public comments, the U.S. Government Accountability Office (GAO)[19] released a report on the SPCC rule, specifically commenting on the uncertainty aspect of the analysis. While the Agency recognizes the comments received, it believes that the fundamental assumptions used in the RIA are reasonable and does not find the comments compelling enough to modify those assumptions. However, EPA conducted a set of sensitivity analyses that provide alternative estimates for the number of SPCC-regulated facilities that are in full compliance with the rule. To address the cost variability issue, EPA developed ranges for the estimates for the cost of compliance with the SPCC rule. EPA took into account the variability associated with various methods of compliance and individual facility storage capacities.

For the final rulemaking, EPA employed new approaches to enhance the existing analyses, while maintaining the original analytical concepts. The Agency took multiple steps to improve the analysis in response to public comments and recommendations provided by GAO, OMB, and other federal agencies. In addition to changes made in response to those comments and recommendations, EPA made improvements to the analysis compared to the RIA for the proposed 2007 rule. Throughout the rulemaking process, EPA actively used the knowledge and expertise of the SPCC Economic Subgroup that consists of economic and technical experts as well as internal staff resources.

The remainder of this chapter provides background information on the Oil Pollution Prevention regulation, identifies the statutory authority for the regulation, summarizes the regulatory changes, and describes the organization of this report.

2.1 Statutory Authority

Section 311(j)(1)(C) of the Clean Water Act (CWA or the Act) authorizes the President to issue regulations establishing procedures, methods, equipment, and other requirements to prevent discharges of oil from vessels and facilities and to contain such discharges.[20] With §2(b)(1) of Executive Order 12777, the President delegated to EPA the authority to regulate non-

[19] "Aboveground Oil Storage Tanks: Observations on EPA's Economic Analysis of Amendments to the Spill Prevention, Control, and Countermeasure Rule" published on August 16, 2007.

[20] 33 U.S.C. 1321(j)(1)(C).

transportation-related onshore facilities under §311(j)(1)(C) of the Act.[21] The President also delegated authority over transportation-related onshore facilities, deepwater ports, and vessels to the U.S. Department of Transportation (DOT), and authority over other offshore facilities, including associated pipelines, to the U.S. Department of the Interior (DOI). A Memorandum of Understanding (MOU) between the Secretary of Transportation and the EPA Administrator, dated November 24, 1971 (36 FR 24080), established the definitions of non-transportation-related facilities and transportation-related facilities. A subsequent MOU, dated November 8, 1993 (published as Appendix B to 40 CFR part 112), among EPA, DOT, and DOI reallocated to EPA the responsibility for non-transportation-related offshore facilities located landward of the coastline.

2.2 Regulatory Background

The Oil Pollution Prevention regulation, at 40 CFR part 112, outlines requirements for prevention of, preparedness for, and response to oil discharges. The changes to the rule affect requirements related to prevention that are collectively known as the Spill Prevention, Control, and Countermeasure rule.

The SPCC rule was originally promulgated on December 11, 1973, at 38 FR 34164, under the authority of §311(j)(1)(C) of the CWA. The SPCC regulation establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities with aboveground oil storage capacity greater than 1,320 gallons, or with completely buried underground oil storage capacity greater than 42,000 gallons. Regulated facilities are also limited to those that, because of their location, could reasonably be expected to discharge oil into the navigable waters of the United States or adjoining shorelines.

An amendment to the rule finalized in 2002 included changes such as exempting certain completely buried underground tanks and wastewater treatment facilities, and establishing a single 1,320-gallon aboveground storage capacity threshold. The changes to the rule also eliminated the provision that required an owner or operator of a facility having an aboveground tank greater than 660 gallons to prepare an SPCC Plan.

An amendment to the rule finalized in 2006 addressed additional issues raised by the 2002 final rule, including those pertaining to facilities with smaller oil storage capacities, qualified oil-filled operational equipment, motive power containers, and mobile refuelers. EPA also removed sections of the rule that are not appropriate for facilities with animal fats and vegetable oils, and extended the compliance dates for farms. Since then, on several occasions, EPA extended the compliance deadlines to provide additional time for the regulated community to prepare and implement SPCC Plans, and to alleviate the need for individual extension requests.

[21] 56 FR 54757 (October 22, 1991), superseding Executive Orders 11735, 38 FR 21243 (August 7, 1973), and 11548, 35 FR 11677 (July 20, 1970).

2.3 Statement of Need for Regulatory Action

EPA has identified opportunities to improve the efficiency of the SPCC regulatory program. To that end, the Agency proposed a series of revisions to the rule in 2005 (70 FR 73524), and received comments on these revisions from regulated parties, professional associations, environmental interest groups, and others. EPA reviewed these comments and evaluated new data about the operations of various industries regulated under the rule, and determined that amending the rule would provide an effective approach to meeting statutory requirements.

2.4 Final Amendments to the Rule

The Environmental Protection Agency is amending the Spill Prevention, Control, and Countermeasure (SPCC) requirements of the Oil Pollution Prevention regulation at 40 CFR part 112. These amendments are intended to address several areas to provide increased clarity, tailor requirements to particular industry sectors, and streamline certain requirements for facility owners and operators subject to the rule. Following is a summary of the key amendments to the rule:

1. Define and exempt hot-mix asphalt (HMA).
2. Exempt pesticide application equipment and related mix containers, regardless of location or ownership, from SPCC requirements. Clarify in the rule preamble that the SPCC definition of mobile refuelers includes nurse tanks used on farms.
3. Exempt residential heating oil containers that are used to store oil for the sole purpose of heating a single-family residence (including a residence at a farm).
4. Amend the definition of “facility” to clarify the flexibility allowed in considering non-contiguous parcels separate facilities when calculating aggregate storage capacity to determine applicability of the SPCC rule.
5. Simplify the process for developing a facility diagram by allowing for a general description of the location and contents of mobile or portable oil storage containers.
6. Define the term “loading/unloading rack” to clarify when the provisions for facility tank car and tank truck loading/unloading racks apply.
7. Provide further streamlined requirements for a subset of qualified facilities.
8. Amend the general secondary containment requirements to provide more clarity. Extend the regulatory relief provided to mobile refuelers in 2006 to non-transportation-related tank trucks at a facility subject to the SPCC rule.
9. Provide flexible security requirements.
10. Provide flexibility to facilities to use tank inspection standards.

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11. Amend integrity testing requirements for food oil containers that meet certain criteria.

12. Exempt production facilities from loading/unloading rack requirements. Amend the definition of "production facility". Extend the timeframe by which a facility must prepare and implement an SPCC Plan. Exempt flowlines and intra-facility gathering lines from sized secondary containment requirements. Establish more specific requirements for a flowline/intra-facility gathering line maintenance program while exempting them from secondary containment requirements and exempt certain inter-facility gathering lines. Establish the option of exempting flow-through process vessels from sized secondary containment requirements while maintaining general secondary containment requirements and requiring additional oil spill prevention measures. Establish alternative options for an oil production facility to be eligible to self-certify an SPCC Plan as a qualified facility. Provide compliance alternatives for produced water storage containers and any associated piping and appurtenances downstream of the container. There are three areas in which EPA seeks to provide clarification on the applicability of the SPCC rule: (1) regarding SPCC rule applicability at drilling and workover facilities; (2) regarding SPCC rule applicability at facilities storing condensate petroleum oil; and (3) the definition of "permanently closed," to address concerns expressed by the regulated community over the requirements for permanently closing a tank, as described in §112.2.

13. Clarify that certain man-made features may serve as secondary containment for oil storage containers.

14. Exempt underground oil storage tanks located at nuclear power generation facilities licensed by the NRC.

15. Provide clarity on the applicability of the rule to wind turbines.

2.5 Comparison of the Total Cost Savings Resulting from the 2008 Final Rule with those Estimated for the 2007 Proposed Rule

For all rule components *except* for the amended requirements for (1) flow-through process vessels and (2) Tier I qualified facilities, the final rule analysis yields an increase in compliance cost savings over the 2007 proposed rule.

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The changes in the cost saving estimates for the individual rule components between the proposed and final rules are primarily attributed to the following factors:

- Modified regulatory requirements for produced water storage containers and marginal oil production facilities.
- Adjustments to the input variables such as updated labor wages and operation and maintenance (O&M) and capital cost estimates
- A new analysis period from 2010 through 2019.[22]

2.5.1 Facility Diagram

The change in the savings estimates due to the amendment associated with preparation of a facility diagram results from a change in assumptions about the labor burden associated with using in-house or professional labor. For the proposed rule RIA, EPA assumed that a facility employing in-house personnel to prepare the SPCC Plan would require 50 percent of the preparation time required by a professional engineering firm. For the final rule RIA, EPA set the in-house labor burden equal to the professional firm labor burden. As a result, the baseline cost of preparing the SPCC Plan and the Facility Diagram portion of the Plan increased by approximately 40 percent. As a result, the cost savings estimate approximately tripled, resulting in an overall annual increase from $0.74 million to $3.37 million.

2.5.2 Loading/Unloading Racks

The change in savings cost estimate due to the amendment associated with loading/unloading racks is explained by a new approach to estimating the cost of general secondary containment. Under EPA's new assumption, Category I facilities would use either a single hose or standpipe at their loading racks, and would not have to install a drainage system or secondary containment for their loading racks. This new approach results in a slight decrease in savings for an average facility, by allowing facilities to replace sized secondary containment for loading/unloading racks with general secondary containment. But shifting the analysis period from 2008-2017 to 2010-2019 increased the overall savings from $48.4 million to $51.9 million per year.

2.5.3 Tier I Qualified Facilities

The change in the estimate for cost savings due to the Tier I qualified facilities amendment results from a clarified estimate of the number of facilities affected by the rule. The resulting decrease in savings was offset as a result of a shift in the analysis period (increased universe of affected facilities) and an increase in the estimate of savings per facility (increased baseline cost of SPCC Plan preparation, certification, and modification). The overall estimated savings as a result of the amendment decreased from $26.6 million to $24.3 million per year.

[22] The rule is scheduled to be signed and published in November 2008. Regulated facilities have until July 1, 2009 to come into compliance. Thus, the estimated analysis period is 2010-2019. At the time of preparing the RIA report for the 2007 SPCC proposed amendments, EPA did not have information on the exact date the proposed amendments would come into effect and assumed the analysis period from 2008 through 2017.

2.5.4 Security

The change in the estimates for the savings due to the amendment associated with security requirements also results from a difference in assumptions about the labor burden associated with using in-house or professional labor. The estimated cost of preparing an impracticability determination or environmental equivalence statement increased significantly as a result; the amendment allows facility operators to develop the security provisions they feel appropriate without preparing an environmental equivalence statement. In addition, there was a slight increase in the universe of affected facilities as a result of shifting the period of analysis from 2008-2017 to 2010-2019. The overall estimated savings as a result of the amendment increased from $7.48 million to $9.38 million per year.

2.5.5 Integrity Testing

Similar to the savings associated with Security requirements, the cost savings from the amendment associated with Integrity Testing are due to not having to prepare an environmental equivalence statement when the referenced tank inspection standard is used by the owner/operator without changes. For the reasons described in the section above, the estimated savings as a result of the amendment increased from $8.95 million to $11.2 million per year.

2.5.6 Six-Month Delay in SPCC Plan Preparation

The change in the estimates for the savings associated with a six-month delay in preparing the SPCC Plan results from a shift in the period of analysis from 2008-2017, which decreases the universe of affected facilities. This decrease was combined with a very slight reduction in the estimated costs associated with amending an SPCC Plan (currently incurred by 75 percent of facilities during the first year of operation). The decrease in amendment costs was caused by a reduction in estimated Professional Engineer certification cost, though the reduction was offset by an increase in the overall labor burden. We now assume that the labor burden required by facilities using in-house labor is equal to the labor burden required by facilities hiring a professional engineering firm. Overall, the estimated savings from this amendment decrease from $25.1 million to $24.2 million per year.

2.5.7 Flow-through Process Vessels

The change in the estimates for the savings due to the amendment associated with flow-through process vessels results from shifting the period of analysis from 2008-2017 to 2010-2019. As a result, the universe of affected facilities deceased slightly, and the overall savings decreased from $7.60 million to $7.37 million per year.

2.6 Objectives of the Economic Analysis

The purpose of this report is to present policy options that are under consideration and to analyze their respective costs and benefits. The report also meets the requirements for

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economic analysis of Executive Order 12866–Regulatory Planning and Review[23]; the Regulatory Flexibility Act (RFA)[24] and Small Business Regulatory Enforcement Fairness Act (SBREFA)[25]; Executive Order 13132–Federalism[26]; Executive Order 13175–Consultation and Coordination with Indian Tribal Governments[27]; Executive Order 13045–Protection of Children from Environmental Health & Safety Risks[28]; Executive Order 13211–Actions That Significantly Affect Energy Supply, Distribution, or Use[29]; the National Technology Transfer and Advancement Act; and the Paperwork Reduction Act (PRA).[30]

This economic analysis considers several regulatory options for each of the final amendments to the issues listed above. For example, the Agency considered the option of exempting asphalt cement containers along with the hot-mix asphalt containers; the option of exempting farms from SPCC requirements, and for all the issues also considered the option of no action.

2.7 Organization of this Report

The remainder of this report is organized as follows:

- Chapter 3 describes the methodology for the analysis.
- Chapter 4 describes the estimation method of the SPCC-regulated universe.
- Chapter 5 discusses the estimated changes in unit compliance costs as a result of the final rule.
- Chapter 6 analyzes the impacts of the final rule on compliance costs and resulting savings by rule component.
- Chapter 7 describes the projected impact of the final rule on human health, welfare, and the environment.
- Chapter 8 presents a summary of small business impacts and responds to Executive Orders.
- Chapter 9 provides key limitations and assumptions of the analysis.
- Chapter 10 presents conclusions of the analysis.

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[23] 58 FR 51735; October 4, 1993.
[24] 5 U.S.C. Sec. 603; 5 U.S.C. Sec. 604.
[25] Public Law 104-121, March 29, 1996.
[26] 64 FR 43255, August 10, 1999.
[27] 65 FR 67249, November 9, 2000.
[28] 62 FR 19885; April 23, 1997.
[29] 66 FR 28355, May 22, 2001.
[30] 44 U.S.C. Sec. 3501.

The second volume of this report includes the following appendices to this report:

- Appendix A presents the results of the questionnaires that were sent to regulated facilities.
- Appendix B provides the sensitivity analysis for the annual cost savings.
- Appendix C presents the data sources used to estimate the universe of facilities regulated by the SPCC rule.
- Appendix D presents details on the methodology used to determine the industry categories for regulated facilities using state databases and Dun & Bradstreet data.
- Appendix E describes how the universe of SPCC-regulated facilities was estimated using industry-specific data.
- Appendix F analyzes the proximity of facilities to navigable waters or adjoining shorelines using geographic information systems (GIS).
- Appendix G describes the use of industry growth rates to project the universe of SPCC-regulated facilities.
- Appendix H briefly compares the unit costs from various sources with EPA estimates.
- Appendix I provides the details of the unit cost inventory.
- Appendix J presents the detailed formulae used in calculating cost savings in Chapter 6.
- Appendix K provides the hypothetical SPCC facility profiles.
- Appendix L presents EPA's response to industry-specific analyses performed by the U.S. Department of Energy (DOE).

Exhibit 2-1 shows the correspondence between the preamble of the final rule and this RIA for each element affected by the final rule.

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Exhibit 2-1
Preamble and RIA Correspondence for Final Amendments

Final Amendment	Preamble Section	RIA Section
Hot-mix Asphalt	**V.A**	**6.1**
Exemption for Hot-mix Asphalt	V.A.1	6.1
Alternative Options Considered	V.A.2	6.1.3
Farms	**V.B**	**6.2**
Exemption for Pesticide Application Equipment and Related Mix Containers	V.B.1	6.2.3.1
Applicability of Mobile Refueler Requirements to Farm Nurse Tanks	V.B.2	6.2.3.2
Alternative Options Considered	V.B.3	6.2.4
Residential Heating Oil Containers	**V.C**	**6.3**
Exemption for Residential Heating Oil Containers	V.C.1	6.3
Alternative Option Considered	V.C.2	6.3.3
Definition of Facility	**V.D**	**6.4.1**
Revisions to the Definition of Facility	V.D.1	6.4.1
Determining the Components of a Facility	V.D.2	N/A
Facility Diagram	**V.E**	**6.5**
Revision to Facility Diagram Requirement	V.E.1	6.5
Indicating Complicated Areas of Piping or Oil-filled Equipment on a Facility Diagram	V.E.2	N/A
Loading/Unloading Racks	**V.F**	**6.6**
Loading/Unloading Rack Definition	V.F.1	6.6
Requirements for Loading/Unloading Racks	V.F.2	N/A
Exclusions	V.F.3	N/A
Alternative Option Considered	V.F.4	6.6.3
Tier I Qualified Facilities	**V.G**	**6.7**
Eligibility Criteria	V.G.1	6.7.1
Provisions for Tier I Qualified Facilities	V.G.2	6.7.1
SPCC Plan Template	V.G.3	N/A
Self-Certification and Plan Amendments	V.G.4	N/A
Tier II Qualified Facility Requirements	V.G.5	N/A
Alternative Options Considered	V.G.6	6.7.4
General Secondary Containment	**V.H**	**6.8**
General Secondary Containment for Non-Transportation-Related Tank Trucks	**V.I**	**6.9**
Security	**V.J**	**6.10**
Integrity Testing	**V.K**	**6.11**
Animal Fats and Vegetable Oils	**V.L**	**6.12**
Differentiation Criteria	V.L.	6.12.1

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Exhibit 2-1
Preamble and RIA Correspondence for Final Amendments

Final Amendment	Preamble Section	RIA Section
Required Recordkeeping	V.L.7	N/A
Oil Production Facilities	**V.M**	**6.13**
Definition of Production Facility	V.M.1	N/A
SPCC Plan Preparation and Implementation	V.M.3	6.13.5
Flowlines and Intra-facility Gathering Lines	V.M.4	6.13.6
Flow-through Process Vessels	V.M.5	6.13.7
Marginal Oil Production Facilities	V.M.6	6.13.8
Produced Water Storage Containers	V.M.7	6.13.9
Clarifications Related to Natural Gas Facilities	V.M.9	6.13.11
Clarification of the Definition of Permanently Closed Containers	V.M.8	6.13.10
Man-made Structures	**V.N**	**6.14**
Underground Emergency Diesel Generator Tanks at Nuclear Power Generation Facilities	**V.O**	**6.15**
Wind Turbines	**V.P**	**6.16**

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Chapter 3

Methodology

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3 Methodology

According to Executive Order 12866, agencies are required to assess all costs and benefits of regulatory activities, including quantitative and qualitative measures. This chapter presents the overall methodology used to estimate the economic impacts of the final amendments to the SPCC regulations and the total cost of compliance with the rule requirements. Section 3.1 describes the regulatory and economic baseline for the analysis; Section 3.2 outlines the basic framework for estimating cost savings from the final amendments to the SPCC rule. Subsequent chapters of the report provide greater detail on specific steps and calculations involved in the estimation, including relevant equations that could be used to replicate the analysis.

3.1 Regulatory Baseline for the Analysis

The impacts of rule amendments depend on the assumed baseline of industry behavior in the absence of a new rule. For the economic impact analysis of the 2008 final amendments to the SPCC rule, EPA used as its baseline the SPCC rule requirements under 40 CFR part 112, as amended in 2002 (71 FR 77266-77293), since the 2006 final rule will be in effect almost simultaneously with these final amendments, if they are finalized. As recommended by EPA's "Guidelines for Preparing Economic Analyses", September 2000, the Agency assumed that facilities are in full compliance with the SPCC rule.

EPA is aware of industry concerns regarding potential non-compliance among owners and operators of facilities of certain sizes and industry sectors, although no statistically valid data exist to assess the extent or magnitude of such non-compliance.[31] EPA explicitly considered whether to incorporate non-compliance in the 2002 Economic Analysis of the SPCC rule:

> "It is possible that [owners and operators of] some facilities have misinterpreted the existing regulation and are not currently in full compliance with existing requirements, but there is no practical way to measure the level of non-compliance. Moreover, ... the costs of coming into compliance with the clarified requirements are not properly attributed to this final regulation."[32]

This regulatory impact analysis is intended to account for the reductions in compliance costs resulting from the final amendments to the SPCC rule. EPA recognizes, however, that actual changes in expenditures depend on the degree of compliance with SPCC requirements by owners and operators of the facilities affected by this rule. Owners and operators of existing facilities that are out of compliance with the current rule would not benefit from the reduced requirements offered by the final rule. To better understand the impacts of potential non-compliance on the estimated cost savings, and in response to comments from OMB and GAO, EPA conducted a sensitivity analysis that examines the economic impact of the rule under two different scenarios. In the first scenario EPA assumed partial compliance (25 percent, 50

[31] EPA's inspection visits to the facilities confirmed partial compliance among SPCC-regulated facilities.

[32] U.S. EPA, May 2002, "Economic Analysis for the Final Revisions to the Oil Pollution Prevention Regulation (40 CFR Part 112)." p. 11.

percent, and 75 percent compliance) in the baseline and after the final amendments (see Appendix B in Volume II). Since the amendments may lead to increased compliance rates because of the lower cost of compliance associated with the reduced requirements and to the greater clarity in applicability of the amendments, in the second scenario EPA assumed partial compliance in the baseline and full compliance after the final amendments. EPA estimated the net impact on owners and operators of facilities in the oil production sector and farm sector that come into compliance. EPA believes that there might be zero compliance with the SPCC rule in the farming community. Therefore, EPA considered partial compliance rate of 0 percent, 25, percent, and 75 percent for the farm sector. The compliance rate of the oil production sector is higher; the U.S. Department of Energy (DOE) estimates that 67 percent of production facilities comply with the secondary containment requirement. Therefore, EPA considered partial compliance rates of 25 percent, 50 percent, 67 percent, and 75 percent for this sector.

Since certain SPCC requirements are similar in nature to those imposed by state regulations and facility owner/operators of many industries follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. Because of the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. As a result, the estimated compliance costs are likely to present an overestimate of the costs attributed to the SPCC rule. However, EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. For details of the state overlap analysis, refer to Section 5.4 of this report. In sum, when reporting the compliance cost and cost savings, EPA accounted for potential overlap with state regulations but not with industry standards.

It is important to note that the overlap with industry standards is relevant for only a few final amendments—e.g. the 12-month delay in the implementation of an SPCC Plan for oil production facilities. The cost savings for these amendments depend on the total facility-level cost of complying with the SPCC rule; however, some of that total cost may actually be attributable to industry standards rather than SPCC requirements. For all other cases, EPA expects that the cost savings would not be affected by industry standards: either the final amendment provides flexibility so that facilities can implement the current industry standard instead of the more stringent requirement in the current SPCC rule (integrity testing, AFVO, security, and flowlines for production facilities), or the Agency expects that industry standards are not necessarily adopted by the facilities (farms).

3.2 Cost Savings from the Final 2008 Rule

This section outlines a general approach for estimating economic impacts on the regulated community as a result of the final amendments to the SPCC rule. The approach involves the following key steps: estimating the number of facilities affected by each provision of the final rule; identifying the specific behavioral changes that may occur (e.g., choosing to prepare a template Plan rather than a full SPCC Plan); estimating the unit costs of affected compliance measures under the baseline and regulatory scenarios; and applying the change in unit costs to the projected number of affected facilities. Total resulting cost savings were annualized over a

10-year period using both 3 percent and 7 percent discount rates. EPA used these discount rates to adjust the estimates for differences in timing, according to OMB Circular A-4.[33]

Exhibit 3-1 outlines this approach. The key steps in the analysis are summarized below:

1. *Estimate the universe of facilities affected by the final rule*. EPA first developed a baseline universe of SPCC-regulated facilities by industry sector and range of oil storage capacities (e.g., facilities with oil storage capacity between 1,321 and 10,000 gallons of oil). For each major component of the final amendments, EPA then estimated the number of facilities that might be affected by the amendments. These entities included facilities that have a maximum of 10,000 gallons of oil in total storage capacity and do not have tanks greater than 5,000 gallons; facilities that are likely to redefine facility boundaries; farms; facilities handling AFVO; oil and gas production facilities; facilities handling hot-mix asphalt; facilities with loading racks; facilities with shop-built or portable containers with less than 5,000 gallons storage capacity; and facilities of various industries having alternative security measures. EPA then projected the anticipated annual change in the number of affected facilities over the 10-year analysis period, using industry-specific growth rates (see Section 4.8).

2. *Estimate changes in compliance cost elements resulting from the final rule.* EPA developed unit cost estimates for specific baseline requirements expected to be affected by the final amendments to the SPCC rule. Baseline requirements were based on the 2002 SPCC rule. EPA also developed unit cost estimates for compliance measures introduced by the final SPCC rule, such as the cost of preparing a template SPCC Plan. EPA did not analyze cost savings associated with non-substantive changes to the requirements such as those that only provide additional clarity on the intent of certain requirements. For example, EPA did not analyze the cost savings from the clarifications regarding the consideration of man-made structures as secondary containment and wind turbines, as these clarifications do not change the SPCC regulatory requirements.

3. *Estimate total increase or reduction in compliance costs to potentially affected facilities*. EPA derived the increase in compliance costs and the cost savings for owners and operators of each type of affected facilities, and multiplied these estimates by the total number of facilities from the particular universe whose owners and operators are expected to take advantage of a given regulatory relief option. Finally, EPA calculated the net change in compliance costs that were annualized over a 10-year period using 3 percent and 7 percent discount rates.

When estimating total cost savings, EPA analyzed changes in compliance costs as a result of the provisions in the final rule, by accounting for the cost savings that owners and operators of

[33] "For regulatory analysis, you should provide estimates of net benefits using both 3 percent and 7 percent." OMB, September 17, 2003, OMB Circular A-4, p. 33-34. Available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

SPCC-regulated facilities would incur if they took advantage of the reduced requirements. The cost savings for owners and operators of regulated facilities from lessened requirements were evaluated against the current SPCC rule amended in 2002. Therefore, in this analysis, the Agency took into account the difference in the requirements between the 2002 final rule and the final rule.

EPA developed a unit cost inventory with cost estimates for each of the 2002 SPCC rule requirements. The Agency obtained estimates from a professional engineering (PE) firm with experience in preparing and reviewing SPCC Plans and construction of structures according to SPCC requirements across a broad spectrum of industries for the 48 contiguous states of the United States.[34] In addition, EPA also visited and conducted interviews of five regulated entities to obtain data on compliance measures at facilities and their associated costs, in order to cross-check the estimates and develop a better understanding of the ranges of cost estimates. A summary of the facility visits and major findings are described in Appendix A in Volume II of this report. Where necessary, major components of the economic model developed for the 2006 regulatory impact analysis (RIA)[35] were also used. In comparison to the analysis performed for the 2006 SPCC rule, the unit cost estimates for various compliance activities have been updated.[36]

In addition, a qualitative discussion on the impact of each final amendment on oil discharge threat is also presented.

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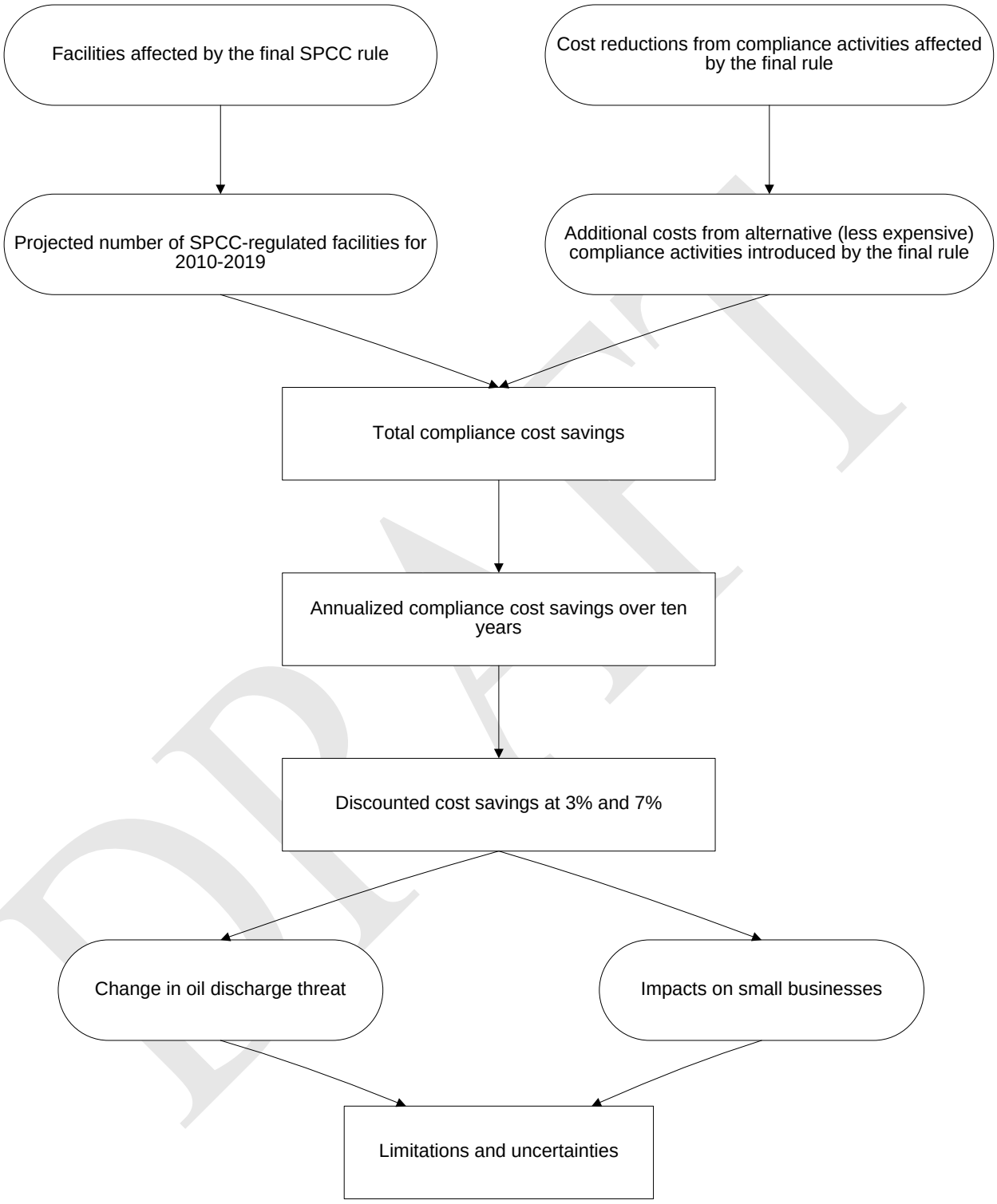
[34] SCS Engineers. See Appendix I for details on the unit cost inventory.

[35] U.S. EPA, November 2006, Regulatory Impact Analysis for the Final Revisions to the Oil Pollution Prevention Regulations (40 CFR PART 112).

[36] Appendix I provides the details of the unit cost inventory and provides a snapshot of the data obtained.

Exhibit 3-1
Main Steps for Estimating the Economic Effects of the Final Rule Changes



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Chapter 4

Estimation of the SPCC-Regulated Universe of Facilities

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4 Estimation of the SPCC-Regulated Universe of Facilities

EPA has invested considerable resources in estimating the number of entities affected by the SPCC rule. This chapter represents the Agency's fourth effort to estimate the universe of affected entities.[37] Using information contained within previous studies and new information, the current analysis estimates that 640,000 facilities will be regulated under the 2002 SPCC rule. In its 2005 RIA for the proposed revisions to the rule, EPA estimated a total of 618,000 SPCC-regulated facilities (projected to 640,000 in 2010).[38] This chapter provides an overview of the data sources used in the analysis, industry sectors and oil storage capacities in which results are presented, and a summary of results. Appendices A through E in Volume II of this report provide additional detail on the methodology employed in the analysis, as well as detailed results.

4.1 Data Sources and Industry Sectors

Based on the availability and relevance of existing data on storage, handling, and use of oil in the United States, EPA used multiple data sources to estimate the number of SPCC-regulated facilities in different industries. Exhibit 4-1 presents the 30 industries examined in the analysis, the corresponding North American Classification System (NAICS) codes for these industries, and the data source(s) used to estimate the number of SPCC-regulated facilities contained within each industry category.[39]

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[37] The Agency's first effort, completed in 1991 and titled the *Spill Prevention, Control, and Countermeasure Facilities Study*, summarized information on small, medium, and large facilities in 16 industry sectors that store oil in aboveground and underground tanks. In 1995, EPA followed this study with a survey of approximately 30,000 facilities within the industries examined in 1991. The 1995 survey yielded detailed information on the oil storage characteristics of surveyed facilities, and was designed to allow statistical extrapolation to a broader universe. EPA used the results of the 1995 survey, the 1991 facility study, and a 1989 American Petroleum Institute (API) report to calculate a 1996 Adjusted National Estimate of (approximately 438,000) affected facilities. The 1996 estimate has been the basis of subsequent EPA analyses of regulatory burdens associated with the SPCC rule. On July 17, 2002, EPA published revisions to SPCC requirements in 40 CFR part 112. In its economic analysis for the final amendments to the 2002 SPCC rule, EPA estimated that approximately 419,000 facilities were covered by the requirements in 2002. However, various industry representatives have suggested that the actual number could be higher.

[38] The number of regulated production facilities for 2007 is estimated at 183, 600.

[39] EPA's 1996 estimate included a large number of facilities under the broad category "Other Commercial Facilities," making it difficult to accurately identify industry sectors included in this study that were previously excluded. In addition, the current study attempts to include facilities that may store animal fats and vegetable oil, which were previously excluded from the 1996 estimate.

Exhibit 4-1
Industry Sectors and Databases Used to Estimate SPCC-Regulated Facilities

Industry Sector	NAICS Code	Data Source[1]
Oil and Gas Production	211111	EIA, 2006
Farms	111, 112	Census of Agriculture, 2002
Electric Utility Plants	2211	EIA,[2] FERC,[3] 2002
Petroleum Refining and Related Industries	324	Economic Census, 2002
Chemical Manufacturing	325	State Databases, 2005
Food Manufacturing	311, 312	State Databases, 2005
Manufacturing facilities using and storing AFVO	311, 325	Economic Census, 2002
Metal Manufacturing	331, 332	State Databases, 2005
Other Manufacturing	31-33	State Databases, 2005
Real Estate Rental and Leasing	531-533	State Databases, 2005
Retail Trade	441-446, 448,451-454	State Databases, 2005
Contract Construction	23	State Databases, 2005
Wholesale Trade	42	State Databases, 2005
Other Commercial	492,541,551,561-562	State Databases, 2005
Transportation	481-488	State Databases, 2005
Arts Entertainment & Recreation	711-713	State Databases, 2005
Other Services (Except Public Administration)	811-813	State Databases, 2005
Petroleum Bulk Stations and Terminals	4247	Economic Census, 2002
Education	61	CBECS,[4] 2005
Hospitals & Other Health Care	621, 622	State Databases, 2005
Accommodation and Food Services	721, 722	State Databases, 2005
Fuel Oil Dealers	45431	Economic Census, 2002
Gasoline stations	4471	Economic Census, 2002
Information, Finance, and Insurance	51, 52	State Databases, 2005
Mining	212	State Databases, 2005
Warehousing and Storage	493	State Databases, 2005
Religious Organizations	813110	CBECS,[4] 2005
Military Installations	928110	Department of Defense, 2005
Pipelines	4861, 48691	Economic Census, 2002
Government	92	CBECS,[4] 2005

NAICS = North American Industry Classification System; EIA = U.S. Energy Information Administration; FERC = Federal Energy Regulatory Commission; CBECS = Commercial Buildings Energy Consumption Survey.

1 See Appendix C in Volume II for a detailed description of data sources.

2 EPA used EIA data on oil stocks at each electric utility plant to estimate the number of power plants in each oil storage capacity category.

3 EPA used FERC information on substations by major utilities to estimate the number of substations.

4 The CBECS is a nationwide survey that contains information on fuel storage and use by commercial buildings that EPA used to generate estimates of the number of government, religious, and educational establishments that are SPCC regulated.

As shown in Exhibit 4-1, EPA used eight state databases to estimate SPCC-regulated facilities in 17 of the 30 industry sectors studied in the analysis: chemical manufacturing; food manufacturing; metal manufacturing; other manufacturing; real estate rental and leasing; retail trade; contract construction; wholesale trade; other commercial; transportation; arts, entertainment, and recreation; other services (except public administration); hospitals and other health care; accommodation and food services; information, finance, and insurance; mining; and warehousing and storage. These databases are discussed in more detail in Appendix C in Volume II.

Although state databases were the primary data source for the majority of industry sectors, federal and proprietary data were available and used to estimate the number of facilities in the sectors with the most facilities regulated by the SPCC rule: farms[40]; oil and gas production; petroleum bulk stations and terminals, fuel oil dealers, pipelines, and petroleum refinery and related industries; electric utilities; airports; military installations; AFVO industry; and education facilities, government establishments, and religious organizations. These data sources are discussed in more detail in Appendix C in Volume II.

4.2 Facility Categories

For the purpose of this analysis, EPA estimated the number of regulated facilities for four size categories based on oil storage capacity at a facility. EPA classified facilities into capacity categories to (1) account for differences in the potential compliance costs experienced by facilities of different sizes; and (2) determine the number of facilities affected by each of the final changes in the SPCC rule, based on a facility's storage capacity. EPA disaggregated the universe of SPCC-regulated facilities into the following four oil storage capacity categories:

- *Category I:* total oil storage capacity greater than 1,320 gallons but less than or equal to 10,000 gallons.
- *Category II:* total oil storage capacity greater than 10,000 gallons but less than or equal to 42,000 gallons
- *Category III:* total oil storage capacity greater than 42,000 gallons but less than or equal to 1,000,000 gallons
- *Category IV:* total oil storage capacity greater than 1,000,000 gallons.

Exhibit 4-2 summarizes the estimated number of SPCC-regulated facilities by size category for the analysis period of 2010 through 2019.

[40] When EPA derived a point estimate for affected farms for the December 2006 final rule, the Agency considered, along with other relevant data, the 2002 average fuel expense broken down by sales class as provided by USDA's Economic Research Service (ERS). Based on these 2002 figures, there were 21,142 farms with revenue exceeding $1 million, 42,181 farms with revenue between $500,000 and $999,999, and 88,674 farms with revenue between $250,000 and $499,000. The summation of these three sales classes is approximately 152,000 farms. Farms in these sales classes are predicted to have aggregate oil storage capacities at central fueling locations ranging from 4,000 to 19,500 gallons based on a screening-level model. These capacities are significantly above the 1,320-gallon threshold, so there is a relatively high degree of confidence that the 152,000 figure represents the floor of potential affected farm facilities, based on 2002 figures. However, there were 187,547 farms with revenue between $100,000 and $249,000 that may also store oil at central fueling above the 1,320-gallon threshold based on the screening-level model. As such, to further evaluate the effect of the December 2006 qualified facilities/self-certification option, EPA chose to include these additional farms when evaluating whether further differentiated requirements for farms were appropriate. Based on this evaluation, EPA concluded that even if the universe of affected farms was actually higher than estimated, the aggregate effect of the December 2006 self-certification option was similar to that estimated in the RIA for that action. The ERS data were taken from a paper presented at a 2004 Farm Foundation Conference by Robert Dubman, Survey and Data Coordinator, titled "Direct Farm Fuel Expenses, Results from a Large Farm Survey."

Exhibit 4-2
2010 Estimated Number of SPCC-Regulated Facilities by Size Category

Size Category	Aggregate Capacity	Estimated Number of Facilities[1]
Category I	1,320 to 10,000 gallons	318,000
Category II	10,001 to 42,000 gallons	205,000
Category III	42,001 to 1 million gallons	115,000
Category IV	Greater than 1 million gallons	3,000
Total		**640,000[2]**

1 Individual values may not sum to the total due to rounding.

2 The estimated analysis period is 2010-2019. At the time of preparing the RIA report for the 2007 SPCC proposed amendments, EPA did not have information on the exact date the proposed amendments would go into effect and assumed the analysis period from 2008 through 2017. As a result, for the proposed rule RIA, the number of affected facilities was estimated at 571,000.

All the facilities included in the analysis were further divided in two categories: production facilities (facilities whose operations and oil storage activities primarily involve oil and gas production) and storage facilities (all other industry groups). EPA estimated that approximately 215,000 production facilities and 425,000 storage facilities are subject to SPCC requirements. The Agency developed separate estimates for the unit cost of compliance for production and storage facilities in Categories I through IV.

Additionally, all SPCC-regulated facilities are divided into existing and new facilities, to reflect the differences in compliance activities between the two groups. Existing facilities include facilities that initiated operations prior to initiation of this final rule. New facilities include those facilities that will initiate operations after this rule goes into effect.

4.3 Comparison with EPA's 1991 Facilities Study

While the current analysis follows the same general methodology as EPA's 1991 study,[41] the two analyses differ in four primary ways: (1) the specific state databases used; (2) the number of industry sectors and the method used to group facilities into industry sectors; (3) the oil storage capacity categories; and (4) the methodology used to extrapolate state data to the entire universe of SPCC-regulated facilities.[42] Exhibit 4-3 summarizes these differences.

41 U.S. EPA, Emergency Response Division, January 1991, "Spill Prevention, Control and Countermeasures Facilities Study."

42 A similar comparison is not made to EPA's 1995 survey because the current analysis is modeled after EPA's 1991 study.

Exhibit 4-3
Comparison with EPA's 1991 Facilities Study

Element of Analysis	1991	2006	Notes
Number of State Database Sources	4	8	• EPA's 1991 study used Illinois, California, Maryland, and New York databases to estimate the universe of medium and large facilities, and the New York database alone to estimate the universe of small facilities. • The current analysis does not use the Illinois data because the latest version of the database does not include capacity information for two-thirds of the records. The current analysis also does not use the California database because it lacks capacity information for one-fifth of the records and does not differentiate aboveground storage tanks (ASTs) from underground storage tanks (USTs). • In EPA's 1991 study, the estimate for the small facilities category was calculated separately for most industry sectors using the New York Major Facilities database, because this database contains a reliable representation of these facilities. EPA was not able to use this database to estimate the overall universe because it did not provide complete industry sector information. • The current analysis matches industry sector data from the Dun & Bradstreet (D&B) database with state database information. EPA is able to use the New York database (along with the other state databases) to estimate the number of SPCC-regulated facilities in all capacity categories.
Number of Industry Sectors	16	30	• The current analysis examines 30 industry sectors, using D&B data to help derive more detailed information on affected industries. However, because previous estimates grouped a large number of facilities into the broad industry sector of "Other Commercial Facilities," it is difficult to determine the extent to which the new figures include previously omitted industries. • The 1991 study focused solely on petroleum and petroleum-related oils. The current analysis attempts to include facilities that may be regulated because of their use or storage of AFVO.
Number of Oil Storage Capacity Categories	3	4	• EPA's 1991 study examined the following oil storage capacity categories: ▪ Small facilities: total oil storage capacity greater than 1,320 gallons but less than or equal to 42,000 gallons. ▪ Medium facilities: total oil storage capacity greater than 42,000 gallons but less than or equal to one million gallons. ▪ Large facilities: total oil storage capacity greater than one million gallons. • The current analysis differentiates the characteristics of facilities with storage capacities between 1,320 and 10,000 gallons from those facilities with storage capacities between 10,001 and 42,000 gallons.
Extrapolation to the SPCC-Regulated Universe	Midpoint	Average Ratio	• The current analysis uses the average ratio because the universe extrapolation is based on a larger number of facilities combining data from more than one state.

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4.4 SPCC Universe Estimation Using State Databases

The estimation methodology employed was similar to that used in EPA's 1991 facilities study: SPCC-regulated facilities were identified in the state databases based on oil storage capacity, corresponding industry categories for all facilities were identified, and state data were extrapolated to the entire country to represent the SPCC-regulated universe nationwide. In total, EPA identified approximately 140,000 SPCC-regulated facilities in the eight state databases. Some 41,000 of those facilities were matched to specific industry categories and then extrapolated to the entire universe using U.S. Census data, yielding a total of 177,000 regulated facilities. The following sections expand upon each methodological step used to calculate the universe estimate.

4.4.1 Identification of SPCC-Regulated Facilities in State Databases

In the current analysis, EPA used eight state databases (Florida, Kansas, Maryland, Minnesota, New York, Oklahoma, Virginia, and Wisconsin) to determine the number of SPCC-regulated facilities in the given state for each industry sector by capacity category.[43] EPA selected these particular state databases because they contain necessary information on the total number of tanks at each facility, the capacity of each tank, and tank contents. The databases also contain name and address information for each facility.[44] EPA identified SPCC-regulated facilities in each oil storage capacity category using these data. As stated, in total, EPA identified 140,000 SPCC-regulated facilities in the eight state databases. Exhibit 4-4 summarizes details of the eight state databases used.

[43] While the data were obtained from state agencies in 2005, the year for which the data were collected might have been different and varied across states.

[44] See Exhibit 4-4 for a summary of information contained within each state database used in the analysis.

Exhibit 4-4
Summary of State Databases Used in the Analysis

State	Data Source	Database Name	Regulatory Requirement	Data Fields	Number of Records
Florida	Florida Department of Environmental Protection (FDEP)	Storage Tank Facility Information	FDEP's Storage Tank Program regulates USTs larger than 110 gallons and ASTs greater than 550 gallons that store petroleum products and hazardous substances at non-residential facilities.	• Tank capacity • Material stored • Facility name & address • Industry sector	• 22,800 ASTs and 61,000 USTs at 20,900 facilities
Kansas	Kansas Department of Health & the Environment (KDH&E)	Permitted Tanks Database	KDH&E regulates petroleum ASTs and USTs larger than 1,100 gallons for farm and residential use, and petroleum ASTs and USTs larger than 660 gallons for other industries.	• Tank capacity • Material stored • Tank status • Facility name & address	• 6,450 USTs at 2,380 facilities • 9,580 ASTs at 3,360 facilities
Maryland	Maryland Department of the Environment (MDE)	AST Oil Operations Database	MDE's Oil Control Program regulates petroleum storage tanks. Registration required for ASTs at facilities with at least 10,000 gallons of storage capacity or at least 1,000 gallons of storage capacity for used oil.	• Tank capacity • Material stored • Facility name & address • Facility four-digit Standard Industrial Classification (SIC)	• 6,330 ASTs at 691 facilities • Includes only tanks currently in use or temporarily closed.
		UST Oil Operations Database	Registration required for all petroleum USTs with the exception of farm and residential USTs smaller than 1,100 gallons.	• Tank capacity • Material stored • Facility name & address • Industry sector	• 13,000 USTs at 5,660 facilities • Includes only tanks currently in use or temporarily closed.
Minnesota	Minnesota Pollution Control Agency (MnPCA)	Tanks Database	Registration required for petroleum ASTs larger than 500 gallons and petroleum USTs covered by EPA's UST program.	• Tank capacity • Material stored • Facility name & address • Industry sector	• 13,700 USTs at 7,570 facilities • 22,900 ASTs at 6,010 facilities • Includes only tanks currently in use or temporarily closed.
New York	New York State Department of Environmental Conservation (DEC)	Petroleum Bulk Storage Database	DEC's Petroleum Bulk Storage Program regulates petroleum storage at facilities with at least 1,100 gallons of storage capacity.	• Tank capacity • Material stored • Tank status • Facility name & address	• 65,500 tanks at 55,800 facilities
		Major Oil Storage Facilities Database	DEC's Major Oil Storage Facilities Program regulates petroleum terminals and transport vessels operating in New York waters with a total storage capacity of 400,000 gallons or more.	• Tank capacity • Material stored • Tank status • Facility name & address	• 9,180 tanks at 344 facilities

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Exhibit 4-4
Summary of State Databases Used in the Analysis

State	Data Source	Database Name	Regulatory Requirement	Data Fields	Number of Records
Oklahoma	Oklahoma Corporation Commission (OCC)	Petroleum Storage Tank Database	Registration required for petroleum USTs over 1,100 gallons for residential and noncommercial agricultural use, and over 110 gallons for all other uses. Petroleum ASTs larger than 110 gallons at certain specified facilities and all petroleum ASTs at bulk plants and commercial facilities require registration.	• Tank capacity • Material stored • Tank status • Facility name & address	• 4,780 ASTs at 2,020 facilities
Virginia	Virginia Department of Environmental Quality (DEQ)	Registered Tanks Database	Registration required for petroleum ASTs over 660 gallons or facilities with a total capacity greater than 1,320 gallons. USTs regulated under EPA's UST Program are included in the database.	• Tank capacity • Material stored • Tank status • Facility name & address • Industry sector	• 8,010 ASTs at 3,000 facilities • 27,000 USTs at 10,500 facilities
Wisconsin	Wisconsin Department of Commerce	Storage Tank Database	Registration required for all USTs larger than 60 gallons and storing petroleum or CERCLA hazardous substances. Farm and residential ASTs larger than 1,100 gallons, and all other ASTs larger than 110, gallons, are registered and included in the database.	• Tank capacity • Material stored • Tank status • Facility name & address	• 70,500 currently in-use tanks • 7,960 ASTs and 60,200 USTs at 44,900 facilities

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4.4.2 Matching Methodology

While each state database used in the analysis contained sufficient information to allow identification of SPCC-regulated facilities, these databases did not contain information on the specific industry sector to which each facility belongs. Therefore, in order to determine the industry associated with each SPCC-regulated facility identified in the state databases, EPA employed a "fuzzy matching" method in which facility information such as name and address from the state databases were matched to D&B Market Spectrum data to assign specific industries to facilities.[45, 46] Appendix D in Volume II discusses the "fuzzy matching" methodology in greater detail.

The matching approach allowed EPA to classify regulated facilities into 30 industry sectors used in the analysis. Since the state databases contained the information on facility's storage capacity, the industry matching was performed for each size category and state. Of the 140,000 SPCC-regulated facilities in the eight states, approximately 31 percent were matched successfully. Exhibit 4-5 summarizes the percentage of matched facilities in each state database used in the analysis. As shown, these percentages range from 21 percent for the Wisconsin database to 81 percent for the Kansas database. Unmatched records are primarily explained by missing records and record inaccuracies.

EPA does not have quantitative data showing whether or not there is a statistically significant difference between facilities for which the industry code could be determined and facilities for which the industry code could not be determined. The Agency assumed that there was no systematic difference between for the two groups – there were no any specific characteristics of the unmatched facilities. Assuming that the matched facilities are not systematically different from the unmatched ones, the distribution of matched facilities in each industry sector was applied to all facilities in that industry sector at the national level.

The Agency used the scale factor to get to the total number of SPCC-regulated facilities estimated from each state database. The scale factor is calculated as one divided by the percentage of matched facilities, and reflects the proportion of facilities that were matched relative to the total number of SPCC-regulated facilities from the state databases. The number of matched facilities is multiplied by the scale factor to estimate the total number of SPCC-regulated facilities for each industry within each state database. By using the scale factor, EPA assumed that the distribution of facilities across industries is identical for matched and unmatched facilities. To the extent this assumption is incorrect, the estimate of total facilities per industry in each state may be over- or underestimated.

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[45] In the matching process, the following facilities and tanks are dropped from the estimation: facilities with less than 1,320 gallons of aggregate storage, tanks with less than 55 gallons of storage, underground tanks subject to EPA UST requirements, inactive tanks, and tanks that do not store oil substances.

[46] D&B Market Spectrum is a suite of related products and services that allows companies to combine their customer data and third party data with D&B's global database, resulting in the most targeted, accurate, and complete database of businesses in the United States. EPA used D&B Market Spectrum data to match facilities to industries in order to use state databases that do not contain industry information. Exhibit 4-4 summarizes the data fields contained within each state database that is used in the analysis. As shown in the exhibit, six of the eight state databases do not contain industry information for each facility.

Exhibit 4-5
Percentage of Matched Facilities after Automated and Manual Matching

State	Total Number of Records	Percentage Matched	Scale Factor
Florida	24,600	35%	2.9
Kansas	3,060	81%	1.2
Maryland	6,430	53%	1.9
Minnesota	6,930	43%	2.4
New York	38,700	28%	3.6
Oklahoma	1,190	45%	2.3
Virginia	11,900	36%	2.8
Wisconsin	47,500	21%	4.8

4.4.3 Extrapolation of Results to the Entire Universe

EPA extrapolated results to the entire country by multiplying the total number of establishments in each industry sector in the United States as contained within the 1997 U.S. Economic Census by a facility ratio, as shown in the equation below.[47] The facility ratio is estimated as the number of SPCC-regulated facilities in the eight states for an industry sector divided by the total number of facilities reported for that industry sector in those states.[48] Exhibit 4-6 summarizes the results of the analysis.

Calculation of Total Universe of SPCC-Regulated Facilities

$$\text{Total Universe of SPCC-Regulated Facilities} = \sum [(Fi * (RFi,c / TFi)]$$

where,

F = the total number of facilities in the United States by industry sector, i

RF = the total number of SPCC-regulated facilities in the eight state databases by facility size category, c, and industry sector, i

TF = the total number of facilities in the eight state databases by industry sector, i

i = facility industry sector

c = facility size category

[47] EPA used the 1997 U.S. Economic Census data because the 2002 U.S. Economic Census data were not complete when the analysis was being conducted.

[48] The facility ratio is calculated using the eight state databases for all capacity categories except Category I. Because the Maryland database does not include information on Category I facilities, the ratio for Category I facilities is calculated using seven state databases (excluding Maryland).

Exhibit 4-6
SPCC Universe Estimates Using State Databases (2010)

Industry Sector	Category I	Category II	Category III	Category IV	Total
Petroleum Refining and Related Industries	87	218	1,300	437	2,000
Chemical Manufacturing	1,100	954	583	26	3,000
Food Manufacturing	1,700	1,400	526	24	4,000
Metal Manufacturing	1,700	727	406	-	3,000
Other Manufacturing	8,900	5,200	1,600	106	16,000
Real Estate Rental and Leasing	26,000	3,300	235	-	29,000
Retail Trade	15,000	2,700	830	51	18,000
Contract Construction	12,000	4,100	772	21	17,000
Wholesale Trade	9,600	3,000	2,100	98	15,000
Other Commercial	13,000	3,500	946	-	17,000
Transportation	8,800	4,900	719	722	15,000
Arts Entertainment & Recreation	13,000	1,400	107	-	14,000
Other Services	6,500	682	169	-	7,000
Hospitals and Other Health Care	5,500	1,270	208	29	7,000
Accommodation and Food Services	4,700	409	36	-	5,000
Information Finance and Insurance	3,800	578	35	-	4,000
Mining	1,300	1,500	320	40	3,000
Warehousing and Storage	1,400	650	596	54	3,000
Total	**133,000**	**36,000**	**12,000**	**2,000**	**182,000**

4.5 SPCC Universe Estimation Using Industry-Specific Data Sources

Where federal government or proprietary data specific to certain industry sectors were available, EPA did not rely on the state databases to estimate the universe of SPCC-regulated facilities. Instead, EPA used different methodologies based on the composition of the specific industry data. Industry-specific data were used to estimate the number of SPCC-regulated facilities in 12 industry sectors, which EPA grouped as follows:

- Farms[49]
- Other petroleum-related (petroleum bulk station and terminals, fuel oil dealers, pipelines, and petroleum refinery and related industries)

[49] When EPA derived a point estimate for affected farms for the December 2006 final rule, the Agency considered, along side other relevant data, the 2002 average fuel expense broken down by sales class as provided by USDA ERS. Based on these 2002 figures, there were 21,142 farms with revenue exceeding $1 million, 42,181 farms with revenue between $500,000 and $999,999, and 88,674 farms with revenue between $250,000 and $499,000. The summation of these three sales classes is approximately 152,000 farms. Farms in these sales classes are predicted to have aggregate oil storage capacities at central fueling locations ranging from 4,000 to 19,500 gallons based on a screening-level model. These capacities are significantly above the 1,320-gallon threshold, so there is a relatively high degree of confidence that the 152,000 figure represents the floor of potential affected farm facilities, based on 2002 figures. However, there were 187,547 farms with revenue between $100,000 and $249,000 that may also store oil at central fueling above the 1,320-gallon threshold based on the screening-level model. As such, to further evaluate the effect of the December 2006 qualified facilities/self-certification option, EPA chose to include these additional farms when evaluating whether further differentiated requirements for farms were appropriate. Based on this evaluation, EPA concluded that even if the universe of affected farms was actually higher than estimated, the aggregate effect of the December 2006 self-certification option was similar to that estimated in the RIA for that action. The ERS data were taken from a paper presented at a 2004 Farm Foundation Conference by Robert Dubman, Survey and Data Coordinator, titled "Direct Farm Fuel Expenses, Results from a Large Farm Survey."

- Oil and gas production
- Electric utilities
- Military installations
- The animal fats and vegetable oils (AFVO)
- Education facilities, government establishments, and religious organizations.

Exhibit 4-7 summarizes the federal government and proprietary data sources used in the analysis; Appendix C in Volume II presents a detailed description of all data sources used in the analysis.

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Exhibit 4-7
Summary of Federal and Proprietary Data Sources and Methodologies Used in the Analysis

Industry Sector	Data Source	Database Name	Primary Data Fields Used	General Methodology
Farms	USDA Census of Agriculture	Farm Production Expenses, 2002 and 1997 Gasoline, fuels, and oils	• Fuel production expenses	• Identify the number of farms and fuel production expense ranges for gasoline and diesel. • Convert production expense ranges to quantity ranges using fuel price data. • Estimate the quantity of purchased fuel that is stored on farms. • Estimate the percentage of farms in each quantity range that are regulated. • Project estimated number of farms from 2002 to 2005.
		Petroleum Products Expenses, 1997, 1992, and 1987	• Cost ranges for gasoline and diesel	
		1982 Census, Volume 1, County Table 6[1]	• Quantity of stored fuel	
		NASS, Number of Farms 1996 to 2005	• Number of farms	
Petroleum Bulk Station and Terminals, Fuel Oil Dealers, Pipelines, and Petroleum Refinery and Related Industries	U.S. Census Bureau	2002 U.S. Economic Census	• Total number of facilities	• Assume all facilities in these industries are SPCC-regulated. • Project number of facilities to 2005.
Oil and Gas Production	Personal Communication	Personal communication with EPA Region 6 and Texas Railroad Commission	• Assumption of four wells per facility[2]	• Assume all active oil wells and gas wells producing condensate oil in 2004 are SPCC-regulated. • Assume four wells per facility. • Project number of facilities to 2005.
	Department of Energy	Energy Information Administration, Distribution and Production of Oil and Gas Wells by State	• Number of active wells producing oil and oil condensate in 2004	

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Exhibit 4-7
Summary of Federal and Proprietary Data Sources and Methodologies Used in the Analysis

Industry Sector	Data Source	Database Name	Primary Data Fields Used	General Methodology
Electric Utilities	U.S. Energy Information Administration	Form EIA-906	• Oil stock at each power plant with generation capacity greater than 1 megawatt	• Estimate SPCC-regulated power plants based on oil stocks as a proxy for oil capacity. • Assume each unique substation filing Form EIA-906 is SPCC-regulated. • Extrapolate to universe of regulated substations using ratio of electric power sold by Form EIA-906 substations to electric power sold nationally.
		March 2005 Electric Power Monthly	• Total retail megawatt hours of electricity sold nationwide	
	Federal Energy Regulatory Commission	Form No. 1	• Number of electric substations	
Military Installations	Department of Defense	Total Military Installations (1995)	• Total number of military Installations	• Assume all military installations are SPCC-regulated.
Animal Fats and Vegetable Oils (AFVO)	U.S. Census Bureau	2005 US Census of Manufacturing	• Number of manufacturing establishments	• Assume a percentage of manufacturing facilities that produce, use, or store AFVO and may be SPCC-regulated. • Apply these percentages to the number of facilities in manufacturing NAICS code categories. • Assume all corn refining plants are SPCC-regulated. • Use specific information on soy ink from industry to assume the proportion of facilities that are SPCC-regulated.
		2002 US Economic Census	• Number of facilities by NAICS code	
	Corn Refiners Association	N/A	• Number of corn refining plants	
	Soy Ink	US manufacturers producing soy ink	• Number of US manufacturers producing soy ink	
Education, Religious Organizations, and Government Establishments	U.S. Department of Energy	Energy Information Administration, 1995 and 2003 Commercial Buildings Energy Consumption Survey (CBECS)	• Total tank capacity in 1995 • Square footage of buildings in 1995 and 2003	• Project tank capacity in 1995 to 2003, using the growth in square footage of buildings from 1995 to 2003 as a proxy for growth in tank capacity. • Project 2003 estimates to 2005.

[1] EPA used the 1982 data for on-farm fuel storage in one of the steps of the estimation process to estimate a fraction of purchased diesel and gasoline that is stored on farms (the Census of Agriculture did not collect these data after 1982). The estimate for the number of farms from which the estimate of the regulated farms is derived is taken from the 2002 Census of Agriculture. This section of Chapter 4 and Appendix E of Volume II provide detailed description of the steps involved.

[2] Personal communication with Richard Franklin, Federal On-Scene Coordinator for EPA Region 6, 2006,.and with Mark England, Texas Railroad Commission, May 2005.

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Exhibit 4-8 summarizes the results of the analysis for the industries discussed in this section. As shown, EPA estimated that approximately 640,000 facilities are regulated in these industries. Details of the industry-specific estimation methodology used for each industry are presented in Appendix D in Volume II.

Exhibit 4-8
SPCC Universe Estimate Using Federal Databases (2010)

Industry Sector	Category I	Category II	Category III	Category IV	Total
Farms	141,000	6,900	557	111	148,568
Petroleum Bulk Stations and Terminals	423	635	3,280	600	4,938
Fuel Oil Dealers	301	1,610	2,210	201	4,322
Pipelines	662	-	-	-	662
Petroleum Refining and Related Industries	87	218	1,310	437	2,052
Oil and Gas Production	10,800	125,000	80,000	-	215,800
Electric Utility Plants	22,700	23,000	15,000	361	61,061
Military Installations	159	159	319	127	765
Manufacturing Facilities Using and Storing AFVO	2,670	3,510	1,620	-	7,800
Education	2,320	6,240	-	-	8,560
Government	595	-	-	-	595
Religious Organizations	1,520	-	-		1,520
Total	**183,000**	**167,000**	**104,000**	**1,840**	**457,000**

4.6 Estimates of the Total SPCC Universe

Exhibit 4-9 presents the 2010 projected estimate of the number of facilities regulated by the SPCC rule for each industry group considered in the analysis. As shown, EPA estimates that approximately 640,000 facilities will be regulated by the 2002 SPCC rule. The majority of the regulated facilities are in Category I (50 percent), followed by Category II (32 percent) and Category III (18 percent). Facilities in Category IV account for less than 1 percent of the total facilities regulated by the SPCC.

Oil and gas production (34 percent) and farms (23 percent) account for the largest percentages of the SPCC-regulated facilities. The electric utility plant industry (10 percent) is the only other industry sector that accounts for more than 5 percent of the total SPCC-regulated facilities.

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Exhibit 4-9
Estimated Universe of SPCC-Regulated Facilities (2010)

Industry Category	NAICS	Facility Oil Storage Capacity Category				Total	Percentage (%)
		Category I	Category II	Category III	Category IV		
Oil and Gas Production	211111	10,800	125,000	80,000	-	216,000	33.70
Farms	111,112	141,000	6,900	557	111	149,000	23.24
Electric Utility Plants	2211	22,700	23,000	15,000	361	61,000	9.52
Real Estate Rental and Leasing	531-533	25,700	3,250	235	-	29,000	4.52
Retail Trade	441-446,448,451-454	14,500	2,710	830	51	18,000	2.81
Contract Construction	23	11,800	4,080	772	21	17,000	2.65
Other Commercial	492,541,551,561-562	12,800	3,510	946	-	17,000	2.65
Other Manufacturing	31-33	8,940	5,210	1,580	106	16,000	2.50
Wholesale Trade	42	9,630	2,990	2,140	98	15,000	2.34
Transportation	481-488	8,750	4,910	719	722	15,000	2.34
Arts Entertainment & Recreation	711-713	12,800	1,390	107	-	14,000	2.18
Education	611	2,320	6,240	-	-	8,600	1.34
Manufacturing facilities using and storing AFVO	311,325	2,670	3,510	1,620	-	7,800	1.22
Other Services	811-813	6,510	682	169	-	7,400	1.15
Hospitals and Other Health Care	621-624	5,530	1,270	208	29	7,000	1.09
Accommodation and Food Services	721-722	4,740	409	36	-	5,200	0.81
Petroleum Bulk Stations and Terminals	4247	423	635	3,280	600	4,900	0.76
Information Finance and Insurance	51,52	3,770	578	35	-	4,400	0.69
Fuel Oil Dealers	45431	301	1,610	2,210	201	4,300	0.67
Gasoline stations	4471	1,850	1,160	749	37	3,800	0.59
Food Manufacturing	311,312	1,730	1,360	526	24	3,600	0.56
Mining	212-213	1,290	1,500	320	40	3,200	0.50
Metal Manufacturing	331,332	1,670	727	406	-	2,800	0.44
Warehousing and Storage	493	1,410	650	596	54	2,700	0.42
Chemical Manufacturing	325	1,080	954	583	26	2,600	0.41
Petroleum Refining and Related Industries	324	87	218	1,310	437	2,100	0.33
Religious Organizations	813110	1,520	-	-	-	1,500	0.23
Military Installations	928110	159	159	319	127	766	0.12
Pipelines	4861, 48691	662	-	-	-	662	0.10
Government	92	595	-	-	-	595	0.09
Total		**318,000**	**205,000**	**115,000**	**3,000**	**640,000**	**100**
Size Distribution		**49.6%**	**31.9%**	**18.0%**	**0.5%**	**100%**	

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Exhibit 4-10 presents the projected estimate of the number of facilities regulated by the SPCC rule for each industry group considered in the analysis, averaged over the analysis period 2010-2019. As shown, EPA estimates that approximately 704,000 facilities will be regulated by the SPCC rule on average. The majority of the regulated facilities are in Category I (50 percent), followed by Category II (37 percent) and Category III (12 percent). Facilities in Category IV account for less than 1 percent of the total facilities regulated by the SPCC.

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Exhibit 4-10
Estimated Universe of SPCC-Regulated Facilities (Average, 2010-2019)

Industry Category	NAICS	Facility Oil Storage Capacity Category				Total	Percentage (%)
		Category I	Category II	Category III	Category IV		
Oil and Gas Production	211111	32,600	176,000	46,200	453	255,000	36.22
Farms	111,112	139,000	6,770	546	109	146,000	20.74
Electric Utility Plants	2211	26,200	26,400	17,400	418	70,500	10.01
Real Estate Rental and Leasing	531-533	28,200	3,570	258	-	32,000	4.55
Retail Trade	441-446,448,451-454	14,600	2,740	840	51	18,300	2.60
Contract Construction	23	12,900	4,440	842	23	18,200	2.59
Other Commercial	492,541,551,561-562	15,600	4,300	1,200	-	21,100	3.00
Other Manufacturing	31-33	8,870	5,160	1,570	105	15,700	2.23
Wholesale Trade	42	9,670	3,000	2,150	99	14,900	2.12
Transportation	481-488	9,770	5,480	803	807	16,900	2.40
Arts Entertainment & Recreation	711-713	14,400	1,570	121	-	16,100	2.29
Education	611	2,820	7,610	-	-	10,400	1.48
Manufacturing facilities using and storing AFVO	311,325	2,720	3,580	1,650	-	7,950	1.13
Other Services	811-813	6,770	709	175	-	7,660	1.09
Hospitals and Other Health Care	621-624	5,890	1,360	222	31	7,500	1.07
Accommodation and Food Services	721-722	5,050	436	38	-	5,520	0.78
Petroleum Bulk Stations and Terminals	4247	332	498	2,570	470	3,870	0.55
Information Finance and Insurance	51,52	4,200	644	39	-	4,890	0.69
Fuel Oil Dealers	45431	287	1,530	2,100	191	4,110	0.58
Gasoline stations	4471	1,760	1,110	714	36	3,620	0.51
Food Manufacturing	311,312	1,780	1,400	542	24	3,750	0.53
Mining	212-213	1,290	1,490	318	40	3,140	0.45
Metal Manufacturing	331,332	1,700	742	414	-	2,860	0.41
Warehousing and Storage	493	2,770	1,280	1,170	106	5,320	0.76
Chemical Manufacturing	325	1,090	960	590	27	2,670	0.38
Petroleum Refining and Related Industries	324	90	224	1,340	448	2,110	0.30
Religious Organizations	813110	1,620	-	-	-	1,620	0.23
Military Installations	928110	171	171	342	136	820	0.12
Pipelines	4861, 48691	628	-	-	-	628	0.09
Government	92	637	-	-	-	637	0.09
Total		**353,000**	**263,000**	**84,200**	**3,570**	**704,000**	**100**
Size Distribution		**50.2%**	**37.4%**	**12.0%**	**0.5%**	**100%**	

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4.7 Advantages and Limitations of the Updated SPCC Universe Estimate

This analysis improves upon the 1991 and 1995 estimates of the SPCC-regulated universe in several ways. First, this analysis is based on the most recent data available, capturing changes in industry structure since 1995. Second, the analysis relies on information from more state databases than were used in EPA's 1991 facilities study (eight compared to four). Further, in the 1991 study, EPA assumed that all electric utility plants were SPCC-regulated; the current estimates are based on oil capacity data, as reported by EIA.

Another advantage of the current estimates is that they provide information for more narrowly defined industry sectors. The 1991 and 1995 studies primarily focused on petroleum and petroleum-related oils. The updated estimate attempts to include facilities that may be regulated because of their use or storage of non-petroleum oils such as AFVO.

A key limitation of the updated estimates is that they are not based on survey data and, therefore, are not statistically reliable. State and federal databases are useful, but are not specifically designed to capture information on the full range of facilities covered by the SPCC rule. A statistically-based survey would be required to obtain complete coverage of all industries with SPCC-regulated facilities. Nevertheless, EPA previously concluded that schedule and resource constraints would prohibit such an effort at this time. Moreover, a rigorous survey may not be worthwhile for industries that contain a small percentage of the total number of SPCC-regulated facilities. Therefore, the Agency utilized the best available data to develop a universe of regulated facilities, and used a range of estimates to assess the impacts of the final regulatory changes on the regulated community.

Another significant limitation of the current approach is that it did not consider the spatial location of facilities to determine the number of facilities that present a reasonable expectation of oil discharge in quantities that may be harmful to navigable waters or adjoining shorelines. Instead, EPA assumed that all non-transportation-related facilities satisfying the capacity threshold are regulated by the SPCC rule, which may be an overestimate. A geographic information system (GIS) screening analysis could help identify facilities that are less likely to be regulated, but was not feasible given the lack of spatial information for many facilities. However, EPA conducted an analysis to assess the percentage of facilities in the Integrated Data for Enforcement Analysis (IDEA) system that contains environmental performance data on EPA-regulated facilities that are near navigable waters or adjoining shorelines. The IDEA system includes facilities in SPCC-regulated industries; it does not include all the SPCC-regulated facilities and is likely to contain facilities that are not SPCC regulated. However, to the extent that this system includes the industries regulated by SPCC, it provides a reasonable assessment of the proximity of these facilities to navigable waters or adjoining shorelines. It is important to note that the Agency did not consider jurisdictional determinations in its estimate of the universe of facilities. The results suggest that approximately 44 percent of facilities are within a quarter mile of a water body, 71 percent are within half a mile of a water body, and as many as 90 percent are within a mile of a water body. This suggests that the assumption that all

the facilities may reasonably discharge into navigable waters or adjoining shorelines is reasonable (see Appendix G in Volume II for more details).

4.8 Projecting SPCC Universe Estimates Using Derived Industry Growth Rates

To project the number of existing and new facilities regulated under the SPCC rule over the period of analysis (2010 through 2019), EPA developed separate estimates of industry-specific growth rates for existing and new facilities using the data for 1992-2002. For existing facilities, EPA used U.S. Economic Census data for all industries except for farms and oil and gas production, for which alternative data sources were used. For new facilities, EPA used information obtained from the D&B Market Spectrum database for all industries except for oil and gas production, for which a specific methodology was employed. The methodologies used to develop the industry growth rate estimates are described in detail in Appendix H in Volume II. Exhibit 4-11 summarizes the growth rates calculated for each industry following these methodologies.

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Exhibit 4-11
Estimated Growth Rates for Total and New Facilities by Industry Sector

SPCC Industry Sector	NAICS Code	Estimated Growth Rates (%)	
		Total Facilities	New Facilities
Oil and Gas Production[1]	211111	-2.13	0.66
Farms	111112	-0.44	0.89
Electric Utility Plants	2211	3.19	3.19
Petroleum Refining and Related Industries	324	0.59	1.81
Chemical Manufacturing	325	0.27	2.43
Food Manufacturing	311, 312	0.65	2.34
Manufacturing facilities using and storing AFVO[2]	311, 325	0.44	2.33
Metal Manufacturing	331, 332	0.44	1.47
Other Manufacturing[3]	31-33	-0.18	2.32
Real Estate Rental and Leasing	531-533	2.06	2.16
Retail Trade	441-446, 448, 451-454	0.27	2.31
Contract Construction	23	1.91	2.83
Wholesale Trade	42	0.10	2.03
Other Commercial	492, 541, 551, 561-562	4.42	4.42
Transportation	481-488	2.43	3.07
Arts Entertainment & Recreation	711-713	2.68	2.68
Other Services (Except Public Administration)	811-813	0.87	1.88
Education	61	4.34	4.34
Petroleum Bulk Stations and Terminals	4247	-5.56	1.61
Hospital & Other Health Care	621, 622	1.42	1.42
Accommodations and Food Services	721, 722	1.40	1.67
Fuel Oil Dealers	45431	-1.10	1.62
Gasoline Stations	4471	-1.07	1.03
Information Finance and Insurance	51, 52	2.39	2.68
Mining	212	-0.10	1.50
Religious Organizations[4]	813110	1.51	1.51
Warehousing and Storage	493	14.30	14.30
Military Installations[4]	928110	1.51	1.51
Pipelines	4861, 48691	-1.21	0.86
Government[4]	92	1.51	1.51
All Industries		**1.51**	**2.24**

1 The estimated annual growth rates for the production sector vary by year.
2 Growth rates are based on data for two NAICS sectors that were identified as key industries expected to produce, use, or store AFVO.
3 Growth rates are based on data for all manufacturing sectors due to a large number of various manufacturing sectors included in this category.
4 Growth rates are based on all entities, due to the lack of census data for specific industries.

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Chapter 5

Compliance Costs

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5 Compliance Costs

EPA developed estimates for the compliance costs that SPCC-regulated facilities incur in order to comply with the rule requirements. Compliance cost estimates served as a major input for assessing the economic impacts of the final regulatory changes, as well as developing a baseline cost of compliance. In particular, compliance cost estimates were used to estimate the economic impact of the final 2008 rule amendments. For this analysis, EPA developed a unit cost inventory with cost estimates for each of the 2002 SPCC rule requirements. EPA relied on the most recent cost estimates from an incomplete effort to develop a unit cost inventory. To complete this inventory, the Agency developed a detailed list of the SPCC requirements that are expected to have a cost impact, and obtained unit cost estimates for each of these requirements from a professional engineering (PE) firm that has experience across a broad spectrum of industries and that serves the 48 contiguous states of the United States.[50] In addition, EPA also conducted interviews of five regulated entities to obtain data on compliance measures at facilities and their associated costs to cross-check the estimates and develop a better understanding of the ranges of cost estimates.[51] Cost estimates are presented separately for production and non-production facilities. A summary of the facility visits and major findings are described in Appendix A in Volume II of this report, and the unit cost inventory is described in Appendix J in Volume II.

In response to GAO recommendations for the 2002 and 2006 SPCC RIAs, EPA undertook an effort to compile additional data to develop a range of SPCC compliance costs rather than presenting point estimates. As a result, EPA compiled a detailed requirement-by-requirement cost inventory that reflects potential distributions of estimates based on unit cost estimates provided by SCS Engineers. To address the cost variability issue, EPA took into account the following two factors that have a significant effect on the magnitude of costs estimates within size categories and industry sectors:

- *Method variability:* For rule requirements that allow different methods or materials (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank), EPA estimated the cost of compliance for each method/material separately and generated a range of estimates based on multiple options.
- *Size variability:* For rule requirements where unit costs are provided for a different number of storage containers and/or containers of different sizes within the same facility size category, EPA developed ranges of cost estimates based on the variability of a storage configuration at SPCC-regulated facilities.

This chapter describes compliance activities required by the 2002 SPCC rule, and presents unit cost estimates for the rule requirements affected by the final rule amendments, along with the

[50] SCS Engineers.

[51] Appendix I in Volume II provides details of comparison of the unit cost estimates from this inventory with other estimates from DOE and the Steel Tank Institute (STI).

underlying assumptions for these activities. Section 5.1 addresses recordkeeping and reporting activities and their respective cost estimates, and Section 5.2 addresses the capital and operation and maintenance (O&M) activities and their respective cost estimates. Section 5.3 presents estimated costs for Tier I Qualified Facilities introduced by the final amendments. Section 5.4 presents estimates developed for the burden reduction associated with similarities in requirements between state regulations and the SPCC rule. The costs of compliance presented in forthcoming chapters account for these overlaps in requirements. However, the costs presented in this chapter provide total compliance costs before factoring in any burden reduction due to overlap with state requirements. Finally, Section 5.5 outlines the approach taken to annualize estimated cost savings over a 10-year analysis period.

5.1 Recordkeeping and Reporting Activities Costs

The primary recordkeeping and reporting activities required by the SPCC rule are the preparation and maintenance of the SPCC Plan along with the preparation of records of inspections and tests. In preparing a Plan, a facility owner or operator must follow the provisions outlined in the regulation, and include a discussion of the measures taken to meet the SPCC requirements. The main provisions are summarized in this section; for more detailed requirements, see the Oil Pollution Prevention regulation itself (40 CFR part 112). Section 5.1.1 focuses on primary inputs into recordkeeping and reporting activities such as wage rates, PE certification costs, and capital paperwork-related costs; Section 5.1.2 describes those activities and provides estimated costs.

5.1.1 Inputs into Recordkeeping and Reporting Activities

5.1.1.1 Wage Rates

EPA used hourly wage rates for specific labor categories to calculate the per-facility cost associated with the rule's paperwork requirements and other SPCC-related activities that require labor hours. For typical new and existing facilities, unit time estimates for management, technical, and clerical personnel were multiplied by the appropriate hourly wage rate and then added to paperwork-related capital costs and PE certification costs to calculate paperwork-related costs. To calculate costs of other SPCC related requirements, such as inspections and training, the labor costs were added to their respective capital costs. The overall approach used to develop a wage rate estimate is described in this section.

The labor wage rates for private industry were derived from the December 2007 U.S. Department of Labor's Employment Cost Indices and Levels.[52] The 2007 wage rates include wages and salaries, as well as benefit costs, which include paid leave, supplemental pay, insurance, retirement and savings, legally required benefits, severance pay, and supplemental unemployment benefits. These wage rates reflect private industry averages, which were estimated by the Bureau of Labor Statistics (BLS) based on a survey of 58,000 occupations within 12,200 establishments in the private sector. These wage rates reflect industry averages, which may underestimate the actual wages received by some SPCC-regulated facility personnel

[52] U.S. Department of Labor, Bureau of Labor Statistics, March 12 2007, Employer Costs for Employee Compensation.

but overestimate the actual wages received by other facility personnel. EPA further adjusted these rates to reflect associated overhead costs.[53] The estimated wage rates used in the analysis are as follows:

- Management: $61.45/hour
- Technical: $53.61/hour
- Clerical: $26.76/hour

EPA assumed the above labor rates would apply to all scenarios when facilities use in-house personnel to satisfy requirements involving labor burden. While all facilities would contract with a PE to certify their Plans, not all facility owners and operators are expected to contract with a PE for activities that can be conducted by in-house personnel. On the one hand, a small facility is more likely to hire outside engineers because it may not have the in-house expertise to comply with the SPCC requirements. On the other hand, a small facility may not have the resources to hire outside engineers and may be in a better position to use in-house labor because the owner may be closely involved with all the operations. A similar two-sided argument can also be made for larger facilities. As a result, EPA estimated cost of compliance with the SPCC requirements for two scenarios: (1) facilities employing outside labor by hiring a PE and (2) facilities providing compliance measures using in-house labor. EPA also assumed that the cost to a facility owner or operator to retain an outside PE to certify the SPCC Plan varies by the size of the facility. EPA used this assumption because a larger facility is likely to have a more complex SPCC Plan, and more complex Plan amendments, than a smaller facility. The burden associated with certifying SPCC Plans and amendments to SPCC Plans, however, accounts for PEs. The estimated wages for PE labor used in this analysis are as follows[54]:

- Management: $150/hour
- Technical: $120/hour
- Drafter: $75/hour
- Clerical: $55/hour
- Contractor: $70/hour

5.1.1.2 Professional Engineer Certification Cost

Unless a facility owner or operator has a self-certified Plan, he or she is expected to incur costs associated with retaining a PE to certify his or her SPCC Plan, along with any subsequent technical amendments that are made to the Plan. In certifying the Plan, the PE attests to having examined the facility and that the Plan has been prepared in accordance with good engineering

[53] Overhead costs were computed separately from BLS data and were assumed to amount to an additional 17 percent of the total wage rate, which is composed of direct wages and salaries and employee benefits, as reported by BLS.

[54] Source: SCS Engineers, a professional engineering firm.

practices that satisfy the SPCC requirements found in 40 CFR part 112. Furthermore, whenever an owner or operator amends an SPCC Plan, a PE must certify each technical amendment.

For this analysis, EPA used the estimates from its unit cost inventory, in which the Agency completed a detailed cost analysis of all the requirements of the 2002 SPCC rule including the cost of preparing and amending an SPCC Plan.

Exhibit 5-1 through Exhibit 5-8 summarize the expected costs for owners or operators of typical SPCC-regulated facilities to retain a PE and to have a PE certify a new Plan, as well as any subsequent amendments.

5.1.1.3 Other Paperwork-Related Costs

EPA estimated that owners and operators of facilities would incur additional costs in complying with the SPCC requirements to maintain Plans and keep records (40 CFR 112.3 and 112.7(e)), and to submit required information in the event of certain discharges of oil (40 CFR 112.4). EPA estimated that to maintain files, owners and operators of new production facilities would purchase file cabinets at a cost of $300. Existing production facilities of all sizes would also incur four hours of technical recordkeeping work annually.[55] For storage facilities, recordkeeping work would comprise an estimated annual burden of 2.5, 3, 5, and 8.5 hours of technical labor for Category I through Category IV facilities, respectively.[56] In addition, EPA estimated a one-time labor burden of two technical labor hours for Category I & II storage facilities to organize recordkeeping; for Category III & IV facilities, EPA estimated a one-time expenditure of $200 for these facilities to purchase tank database software.[57]

In the event of certain discharges, the owner or operator must submit required information to the Regional Administrator and to the implementing state or local agency in charge of oil pollution control activities for the area in which the facility is located. Consequently, the owner or operator would incur costs for photocopying and postage, which are classified as O&M costs. EPA estimated these mailing costs to be $14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities. Variation in these estimates is based upon the increased cost of photocopying longer SPCC Plans at larger facilities. In addition, all applicable facilities would incur an estimated burden of one hour of managerial labor and one hour of technical labor. Because only 0.15 percent of facilities are expected to experience oil discharges that trigger an information submission, the expected annual capital costs to an owner or operator of a typical facility are negligible.[58]

[55] Personal communication with Hector Cavazos, February 2007, regulatory advisor for Chevron oil production facilities, Humble, TX.

[56] Interviews of regulated facilities (see Appendix A for details), January-February 2007; 2006 Final Rule RIA, December 2006.

[57] Personal communication with Scott Baker, Supervisor at Environmental Engineering Department, Sunoco petroleum refinery, Philadelphia, PA, February 2007.

[58] See Section 5.1.2.3 for the assumption on the fraction of facilities expected to submit information due to oil discharges.

5.1.2 Recordkeeping and Reporting Activities

Recordkeeping and reporting activities required by the SPCC regulation include preparing new Plans, as well as modifying and maintaining existing Plans. This section describes the assumptions used by EPA when estimating the per-facility cost associated with the rule's paperwork requirements. Exhibit 5-1 through Exhibit 5-8 present the cost related to recordkeeping and reporting activities described below for new and existing facilities.

5.1.2.1 Prepare an SPCC Plan (New Facilities)

The owner or operator of a new facility must prepare and implement an SPCC Plan in accordance with the requirements set forth in 40 CFR part 112. Since this is a one-time cost incurred at the time a facility begins operations, only new facilities incur this cost. The actual preparation of the Plan involves several separate tasks, the majority of which EPA assumed are conducted by the facility's technical personnel. These tasks include:

- *Field investigations,* which are conducted by technical personnel in order to better understand the design of the facility and to accurately predict the areas or equipment most likely to discharge oil (this involves predicting the flow paths of discharged oil) (§112.7(b)).
- *A regulatory review* conducted by management personnel, such that the technical and clerical personnel in charge of actually preparing the Plan are fully aware of all requirements in 40 CFR part 112 and any applicable more stringent state rules, regulations, and guidelines (§112.7(j)).
- *A review of existing procedures* conducted by technical personnel to determine the effectiveness of the current discharge prevention and control practices employed by the facility owner or operator.
- *Preparation of the Plan,* which involves both technical and clerical time, as well as a final review by facility management personnel prior to submission (§112.3). Components of the Plan include a facility diagram[59] and description of storage areas (§112.7(a)(3)) and organizing portions of the Plan to be used in reporting a discharge (§112.7(a)(4) and §112.7(a)(5)).
- *Certification by a licensed Professional Engineer (PE),* which must be conducted for each new Plan (unless a facility owner or operator has a self-certified Plan). A Plan must also be re-certified by a PE whenever technical amendments are made (§112.3(d)).

[59] The estimate presented in this RIA is based on a formal facility diagram. It is likely that more complex facilities might need a formal diagram, while smaller facilities may prepare a sketch. EPA's research shows that engineering diagrams for most enterprises are rather expensive. Admittedly, some diagrams can be drawn on a piece of paper. This kind of diagram may be appropriate for very simple operations. For others, this type of diagram may have no value, and a more robust diagram is required. Patricia Fleming (EPA/Office of Emergency Management) indicated that, in her experience as an inspector in Region 3, facilities submitted a range of diagrams, many of which were developed for other purposes; thus the cost would not necessarily be attributable to SPCC. (Personal communication, June 2008.)

Plan preparation costs affect owners and operators of new facilities that become subject to the SPCC rule. New facilities are those that will initiate operations during the 10-year period considered in the analysis. Owners and operators of such facilities are required to prepare and implement their SPCC Plans within one year of initiating facility operations. Therefore, owners and operators of new facilities are assumed to incur the total cost of preparing a Plan in the first year.

5.1.2.2 Review the SPCC Plan (Existing Facilities)

Owners or operators of an SPCC-regulated facility are required to review and evaluate their Plans at least once every five years (§112.5(b)). This review is estimated to involve mostly technical personnel, who will evaluate discharge prevention and control procedures being implemented under the current Plan, and management personnel, who will conduct a regulatory review. In order to complete the necessary paperwork, the involvement of clerical personnel will also be necessary. An owner or operator is required to amend the facility's SPCC Plan within six months of the review to include more effective prevention and control technology if: (1) such technology will significantly reduce the likelihood of a discharge as described in §112.1(b) from the facility; and (2) such technology has been field-proven at the time of the review. A PE must also certify any technical amendments to the Plan prior to implementation. EPA applied cost estimates for reviewing SPCC Plans only to existing facilities, since an owner or operator of a new facility would not be required to conduct the review until five years after starting operation.

The total cost incurred by owners and operators of existing facilities for this review is greater if, following the review, they must amend their Plan.

5.1.2.3 Submit Information in the Event of Certain Discharges of Oil (New and Existing Facilities)

In the event of certain discharges of oil into navigable waters, within 60 days of the discharges, a facility owner or operator must submit to the Regional Administrator information described in §112.4(a). Either of the following types of discharges of oil occurring within any 12-month period triggers the §112.4 reporting requirements:

1. A single discharge as described in §112.1(b) of more than 1,000 U.S. gallons into or upon navigable waters or adjoining shorelines

2. Two or more discharges as described in §112.1(b), each of which is over 42 U.S. gallons, into or upon navigable waters or adjoining shorelines.

Submission of information after a discharge of oil is estimated to involve both technical personnel time for collecting the required information, as well as time for review by management personnel before the information is submitted. Section 112.4(c) also requires that the facility owner or operator submit a copy of this information to the state agency in charge of oil pollution control activities for the area in which the facility is located. The Regional Administrator may require the owner or operator of the facility to amend the SPCC Plan to prevent and contain discharges from the facility. Such amendments, if uncontested by the facility owner or operator,

must become part of the Plan 30 days after the Regional Administrator responds to the facility owner or operator concerning the final amendments. A PE must then certify the amended Plan prior to implementation. As required by §112.4(e), amendments to the Plan must be implemented as soon as possible, but no later than six months after the amendments become part of the Plan. Section 112.4(f) allows a facility owner or operator to appeal a decision made by the Regional Administrator requiring a Plan amendment.

Training a designated person who is accountable for discharge prevention and who reports to facility management is estimated to take a burden of two technical hours of labor annually. EPA assumed that this burden applies to all types and sizes of regulated facilities.

5.1.2.4 Revise the SPCC Plan (New and Existing Facilities)

The facility owner or operator must amend the facility's Plan in accordance with §112.7 whenever there is a change in the facility's design, construction, operation, or maintenance that materially affects the facility's potential to discharge oil into navigable waters or adjoining shorelines. Such changes may include the dismantling and removal of a container; the addition of a new or rebuilt container; a change in the service of a container; any physical changes or improvements to the facility; or the construction of a new well and associated piping. The activities to amend the SPCC Plan as a result of these facility changes are estimated to involve mostly facility technical personnel, as well as some clerical personnel. A PE must also certify the amended Plan prior to implementation (§112.5(c)). Such amendments to the SPCC Plan must be implemented as soon as possible, but not later than six months after the change occurs.

Owners and operators of some fraction of SPCC-regulated facilities (new and existing) will be required to amend their Plans as a result of discharging oil or modifying their facility (§112.5(a)).

5.1.2.5 Maintain the SPCC Plan and Keep Records (New and Existing Facilities)

Section §112.3 requires the owner or operator to maintain a copy of the SPCC Plan at the facility, if the facility is normally attended for at least four hours per day or, if not, at the nearest field office. The Plan must be available to the Regional Administrator for review during normal working hours (40 CFR 112.3(e)). In addition, a facility owner or operator is required to maintain (and update) Plan-specific records as outlined under §112.7(e), §112.8(c)(6), and §112.12(c)(6). A facility owner or operator is also required to maintain records of events such as drainage of uncontaminated wastewater by bypassing facility treatment systems (§112.8(c)(3)(iv), §112.12(c)(3)(iv)). Plan maintenance and recordkeeping activities are estimated to involve almost entirely technical personnel time, although a small amount of clerical personnel time may also be required for these activities.

Per-facility burden hour estimates are based primarily on the information from a PE firm. These estimates were developed for production and storage facilities of various sizes, and for clerical, technical/engineering, and management hours. The burden included new Plan preparation (site work, regulatory review, review of existing procedures, formulating new procedures, and preparing the Plan); Plan modification (site work, regulatory review, review of existing

procedures, formulating new or changed procedures or recommendations, and preparing the amendment); formal review (site work, regulatory review, review of existing procedures, and preparing the review report); submittal of information after a discharge; and recordkeeping requirements (maintaining the Plan, and maintaining records of inspections and of equipment maintenance).

5.1.2.6 Estimated Paperwork-Related Activity Burden

EPA relied on the unit cost inventory analysis for the estimates of paperwork-related activity burden. Exhibit 5-1 through Exhibit 5-8 present cost estimates for recordkeeping and reporting activities for production and non-production facilities separately, as unit costs for the two types of facilities vary significantly. For new facilities, Exhibit 5-1 and Exhibit 5-2 present the estimated activity burden for individual compliance items in the baseline using in-house labor estimates; Exhibit 5-3 and Exhibit 5-4 present the estimated burden for individual items using the assumption that Professional Engineers will be used to satisfy the requirements. For existing facilities, these costs are presented in Exhibit 5-5 through Exhibit 5-8. In all cases, EPA assumed that drafting work using in-house labor would incur the same hourly costs as clerical work completed by facility personnel.

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Exhibit 5-1
2002 Baseline Activity Plan Preparation and Maintenance (*In-House* Labor, New *Production* Facility)

Type of Facility[1]	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[2]	Travel and Other Expenses	PE Certification Cost[3]	Labor Cost	Total Cost[4]
	$61/hour	$52/hour	$75/hour	$27/hour	$70/hour					
Preparation of New Plan[5]										
Category I	1	16	8	2	--	27	--	$748	$1,550	$2,300
Category II	3	32	15	4	--	54	--	$1,500	$3,100	$4,500
Category III	5	64	30	8	--	107	--	$2,990	$6,200	$9,190
Category IV	8	96	45	12	--	161	--	$4,490	$9,300	$13,800
Recordkeeping and Oil Discharge Reporting[6]										
Category I	1	1	--	--	--	2	$314	--	$115	$429
Category II	1	1	--	--	--	2	$314	--	$115	$429
Category III	1	1	--	--	--	2	$316	--	$115	$431
Category IV	1	1	--	--	--	2	$321	--	$115	$436

1 See Chapter 4 for a definition of the facility types.

2 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

3 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

4 Due to rounding, total costs may not be an exact sum of the component costs listed.

5 A one-time cost. This item includes the cost of assessing areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; preparing a facility diagram; preparing a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organizing parts of the SPCC Plan to be used in reporting a discharge and during an emergency (if the facility has not submitted a Facility Response Plan).

6 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). Additional costs for all facilities include a one-time expenditure of $300 for purchasing a file cabinet and setting up the office. Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

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Exhibit 5-2
2002 Baseline Activity Plan Preparation and Maintenance (*In-House* Labor, New *Storage* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$61/hour	$52/hour	$75/hour	$27/hour	$70/hour					
Preparation of New Plan[4]										
Category I	2	30	12	4	--	48	--	$1,500	$2,740	$4,230
Category II	4	60	24	8	--	96	--	$2,990	$5,480	$8,470
Category III	7	90	30	12	--	139	--	$4,490	$7,830	$12,500
Category IV	12	135	40	20	--	207	--	$6,730	$11,500	$18,200
Recordkeeping and Oil Discharge Reporting[5]										
Category I	1	3	--	--	--	4	$314	--	$222	$536
Category II	1	3	--	--	--	4	$314	--	$222	$536
Category III	1	1	--	--	--	2	$516	--	$115	$631
Category IV	1	1	--	--	--	2	$521	--	$115	$636

1 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

2 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

3 Due to rounding, total costs may not be an exact sum of the component costs listed.

4 A one-time cost. This item includes the cost of assessing areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; preparing a facility diagram; preparing a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organizing parts of the SPCC Plan to be used in reporting a discharge and during an emergency (if the facility has not submitted a Facility Response Plan).

5 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). Additional costs for all facilities include a one-time expenditure of $300 for purchasing a file cabinet and setting up the office. In addition, all Category III and IV facilities incur a one-time expenditure of $200 for purchasing database software. Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

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Exhibit 5-3
2002 Baseline Activity Plan Preparation and Maintenance (*Professional* Labor, New *Production* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$150/hour	$120/hour	$75/hour	$55/hour	$70/hour					
Preparation of New Plan[4]										
Category I	1	16	8	2	--	27	--	$748	$2,780	$3,530
Category II	3	32	15	4	--	54	--	$1,500	$5,560	$7,060
Category III	5	64	30	8	--	107	--	$2,990	$11,100	$14,100
Category IV	8	96	45	12	--	161	--	$4,490	$16,700	$21,200
Recordkeeping and Oil Discharge Reporting[5]										
Category I	1	1	--	--	--	2	$314	--	$115	$429
Category II	1	1	--	--	--	2	$314	--	$115	$429
Category III	1	1	--	--	--	2	$316	--	$115	$431
Category IV	1	1	--	--	--	2	$321	--	$115	$436

1 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

2 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

3 Due to rounding, total costs may not be an exact sum of the component costs listed.

4 A one-time cost. This item includes the cost of assessing areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; preparing a facility diagram; preparing a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organizing parts of the SPCC Plan to be used in reporting a discharge and during an emergency (if the facility has not submitted a Facility Response Plan).

5 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). Additional costs for all facilities include a one-time expenditure of $300 for purchasing a file cabinet and setting up the office. Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

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Exhibit 5-4
2002 Baseline Activity Plan Preparation and Maintenance (*Professional* Labor, New *Storage* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$150/hour	$120/hour	$75/hour	$55/hour	$70/hour					
Preparation of New Plan[4]										
Category I	2	30	12	4	--	48	--	$1,500	$5,020	$6,520
Category II	4	60	24	8	--	96	--	$3,290	$10,000	$13,000
Category III	7	90	30	12	--	139	--	$4,490	$14,800	$19,000
Category IV	12	135	40	20	--	207	--	$6,730	$22,100	$28,800
Recordkeeping and Oil Discharge Reporting[5]										
Category I	1	3	--	--	--	4	$314	--	$222	$536
Category II	1	3	--	--	--	4	$314	--	$222	$536
Category III	1	1	--	--	--	2	$516	--	$115	$631
Category IV	1	1	--	--	--	2	$521	--	$115	$636

1 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

2 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

3 Due to rounding, total costs may not be an exact sum of the component costs listed.

4 A one-time cost. This item includes the cost of assessing areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; preparing a facility diagram; preparing a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organizing parts of the SPCC Plan to be used in reporting a discharge and during an emergency (if the facility has not submitted a Facility Response Plan).

5 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). Additional costs for all facilities include a one-time expenditure of $300 for purchasing a file cabinet and setting up the office. Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

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Exhibit 5-5
2002 Baseline Activity Plan Preparation and Maintenance (*In-House* Labor, Existing *Production* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$61/hour	$52/hour	$75/hour	$27/hour	$70/hour					
Plan Amendment[4]										
Category I	1.25	7.5	--	1	--	10	--	$1,010	$506	$1,520
Category II	2.5	15	--	2	--	20	--	$2,010	$1,010	$3,020
Category III	5	30	--	4	--	39	--	$4,030	$2,020	$6,050
Category IV	8	45	--	6	--	59	--	$6,040	$3,030	$9,070
Five-Year Review[5]										
Category I	0.5	7.5	--	0.5	--	9	--	--	$446	$446
Category II	1	15	--	1	--	17	--	--	$892	$892
Category III	2	30	--	2	--	34	--	--	$1,790	$1,790
Category IV	3	45	--	3	--	51	--	--	$2,680	$2,680
Recordkeeping and Oil Discharge Reporting[6]										
Category I	1	5	--	--	--	6	$14	--	$329	$343
Category II	1	5	--	--	--	6	$14	--	$329	$343
Category III	1	5	--	--	--	6	$16	--	$329	$345
Category IV	1	5	--	--	--	6	$21	--	$329	$350

1 Estimates represent the average of a small range of possible labor burden hours and costs. For example, an estimate for amending a Plan for a Category I facility could vary from $1,360 to $2,160, depending on the scale of changes required by the amendment.

2 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

3 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

4 Due to rounding, total costs may not be an exact sum of the component costs listed.

5 A review of the SPCC Plan every five years is required by 40 CFR 112.5(b). Changes are also required when technical amendments are made; and we estimate that 10% of facilities make technical changes every year; in addition, 3% of facilities make changes each year based on 5-year review. Thus, the annual cost burden reflects an estimate that 13% of facilities will incur these changes annually. Source: SCS Engineers; 2002 SPCC ICR.

6 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). In addition, all facilities require four hours of technical labor for recordkeeping annually. (Source: site visits to production facilities: see Appendix A.)

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Exhibit 5-6
2002 Baseline Activity Plan Preparation and Maintenance (*In-House* Labor, Existing *Storage* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$61/hour	$52/hour	$75/hour	$27/hour	$70/hour					
Plan Amendment[4]										
Category I	3	15	--	2	--	20	--	$2,010	$1,010	$3,020
Category II	5	30	--	4	--	39	--	$4,030	$2,020	$6,050
Category III	7.5	45	--	6	--	59	--	$6,040	$3,030	$9,070
Category IV	11.5	67.5	--	9	--	88	--	$9,140	$4,570	$18,300
Five-Year Review[5]										
Category I	2	15	--	2	--	19	--	--	$981	$981
Category II	2	30	--	2	--	34	--	--	$1,790	$1,790
Category III	3	45	--	3	--	51	--	--	$2,680	$2,680
Category IV	5	68	--	4.5	--	77	--	--	$4,040	$4,040
Recordkeeping and Oil Discharge Reporting[6]										
Category I	1	3.5	--	--	--	4.5	$14	--	$249	$263
Category II	1	4	--	--	--	5	$14	--	$276	$290
Category III	1	6	--	--	--	7	$16	--	$383	$399
Category IV	1	10	--	--	--	11	$21	--	$571	$592

1 Estimates represent the average of a small range of possible labor burden hours and costs. For example, an estimate for amending a Plan for a Category I facility could vary from $2,520 to $3,930, depending on the scale of changes required by the amendment.

2 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

3 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

4 Due to rounding, total costs may not be an exact sum of the component costs listed.

5 A review of the SPCC Plan every five years is required by 40 CFR 112.5(b). Changes are also required when technical amendments are made; and EPA estimated that 10% of facilities make technical changes every year; in addition, 3% of facilities make changes each year based on 5-year review. Thus, the annual cost burden reflects an estimate that 13% of facilities will incur these changes annually. Source: SCS Engineers/2002 SPCC ICR.

6 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). In addition, all facilities require four hours of technical labor for recordkeeping annually. (Source: site visits to production facilities: see Appendix A.)

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Exhibit 5-7
2002 Baseline Activity Plan Preparation and Maintenance (*Professional* Labor, Existing *Production* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$150/hour	$120/hour	$75/hour	$55/hour	$70/hour					
Plan Amendment[4]										
Category I	1.25	7.5	--	1	--	10	$200	$1,010	$1,140	$2,350
Category II	2.5	15	--	2	--	20	$200	$1,910	$1,790	$3,900
Category III	5	30	--	4	--	39	$200	$4,030	$4,570	$8,800
Category IV	8	45	--	6	--	59	$200	$6,040	$13,700	$19,900
Five-Year Review[5]										
Category I	0.5	7.5	--	0.5	--	9	$200	--	$1,000	$1,200
Category II	1	15	--	1	--	17	$200	--	$2,010	$2,210
Category III	2	30	--	2	--	34	$200	--	$4,010	$4,210
Category IV	3	45	--	3	--	51	$200	--	$6,020	$6,220
Recordkeeping and Oil Discharge Reporting[6]										
Category I	1	5	--	--	--	6	$14	--	$329	$343
Category II	1	5	--	--	--	6	$14	--	$329	$343
Category III	1	5	--	--	--	6	$16	--	$329	$345
Category IV	1	5	--	--	--	6	$21	--	$329	$350

1 Estimates represent the average of a small range of possible labor burden hours and costs. For example, an estimate for amending a Plan for a Category I facility could vary from $2,010 to $3,090, depending on the scale of changes required by the amendment.

2 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

3 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

4 Due to rounding, total costs may not be an exact sum of the component costs listed.

5 A review of the SPCC Plan every five years is required by 40 CFR 112.5(b). Changes are also required when technical amendments are made; and EPA estimated that 10% of facilities make technical changes every year; in addition, 3% of facilities make changes each year based on 5-year review. Thus, the annual cost burden reflects an estimate that 13% of facilities will incur these changes annually. Source: SCS Engineers/2002 SPCC ICR.

6 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). In addition, all facilities require four hours of technical labor for recordkeeping annually. (Source: site visits to production facilities: see Appendix A.)

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Exhibit 5-8
2002 Baseline Activity Plan Preparation and Maintenance (*Professional* Labor, Existing *Storage* Facility)

Type of Facility	Burden Hours						Burden Cost (2007$)			
	Managerial	Technical	Drafter	Clerical	Contractor	Labor Hours[1]	Travel and Other Expenses	PE Certification Cost[2]	Labor Cost	Total Cost[3]
	$150/hour	$120/hour	$75/hour	$55/hour	$70/hour					
Plan Amendment[4]										
Category I	3	15	--	2	--	20	$200	$2,010	$1,790	$4,000
Category II	5	30	--	4	--	39	$200	$4,030	$4,570	$8,800
Category III	7.5	45	--	6	--	59	$200	$6,040	$6,860	$13,100
Category IV	11.5	67.5	--	9	--	88	$200	$9,140	$10,300	$19,600
Five-Year Review[5]										
Category I	2	15	--	2	--	19	$200	--	$2,210	$2,410
Category II	2	30	--	2	--	34	$200	--	$4,010	$4,210
Category III	3	45	--	3	--	51	$200	--	$6,020	$6,220
Category IV	5	68	--	4.5	--	77	$200	--	$9,080	$9,280
Recordkeeping and Oil Discharge Reporting[6]										
Category I	1	3.5	--	--	--	4.5	$14	--	$249	$263
Category II	1	4	--	--	--	5	$14	--	$276	$290
Category III	1	6	--	--	--	7	$16	--	$383	$399
Category IV	1	10	--	--	--	11	$21	--	$571	$592

1 Estimates represent the average of a small range of possible labor burden hours and costs. For example, an estimate for amending a Plan for a Category I facility could vary from $3,620 to $5,780, depending on the scale of changes required by the amendment.

2 Due to rounding, total labor hours may not be an exact sum of the labor hours listed.

3 PE costs represent the cost of hiring an outside engineer for certification of the Plan.

4 Due to rounding, total costs may not be an exact sum of the component costs listed.

5 A review of the SPCC Plan every five years is required by 40 CFR 112.5(b). Changes are also required when technical amendments are made; and EPA estimated that 10% of facilities make technical changes every year; in addition, 3% of facilities make changes each year based on 5-year review. Thus, the annual cost burden reflects an estimate that 13% of facilities will incur these changes annually. Source: SCS Engineers/2002 SPCC ICR.

6 The compliance burden for oil discharge reporting activities includes mailing costs ($14 for Category I & II facilities, $16 for Category III facilities, and $21 for Category IV facilities) and one hour of both managerial and technical labor (for all categories of facilities). These costs are expected to affect only 0.15% of facilities annually (see Section 5.1.1.3). In addition, all facilities require four hours of technical labor for recordkeeping annually. (Source: site visits to production facilities: see Appendix A.)

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5.2 Capital and Operation and Maintenance (O&M) Activities Costs

Below are descriptions of capital and operation and maintenance activities followed by a discussion of their estimated costs.

5.2.1 Capital and O&M Activities

5.2.1.1 Secondary Containment Requirements

Various sections of the rule require secondary containment to prevent discharges of oil to navigable waters or adjoining shorelines. Sections 112.8(c)(2) and 112.12(c)(2) require secondary containment for the entire capacity of the largest single bulk storage container and sufficient freeboard to contain precipitation. Section 112.7(c) requires secondary containment at a transfer area (other than a loading/unloading rack). The SPCC rule also requires secondary containment for oil-filled electrical equipment (§112.7(c)). Other secondary containment provisions apply to mobile or portable containers (§§112.8(c)(11) and 112.12(c)(11)). For storage facilities, §112.7(h) requires containment of at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility at a loading or unloading rack, and §112.7(c) requires secondary containment for piping. For production facilities, the SPCC rule requires secondary containment for heater-treaters (§112.9(c)(2)); secondary containment for produced water containers; and secondary containment for piping (within tank battery, outside tank battery, and for intra-facility gathering lines) (§112.7(c)).

5.2.1.2 Cost Estimates for Secondary Containment

Unit costs of providing secondary containment were also estimated using EPA's unit cost inventory analysis. The cost of constructing a secondary containment structure is a one-time capital expenditure that EPA assumed owners and operators of new facilities would incur in the first year. Some burden is associated with maintenance of secondary containment such as debris removal. EPA did not include a cost estimate for this type of maintenance activity, as the Agency assumed that the cost for these activities is embedded in the overall facility maintenance costs and is not significant. Exhibit 5-9 presents itemized capital costs of the key secondary containment measures for new facilities that are likely to be affected by the final amendments. Secondary containment construction is a one-time cost incurred by a new facility in the first year of its operation, so this cost is not incurred by existing facilities.

EPA assumed that all production facilities would claim impracticability rather than incur costs of secondary containment for flowlines and gathering lines because of the high costs of installing these structures.

Exhibit 5-9
2002 Baseline Capital Costs of Secondary Containment (New Facilities)[1]

Type of Facility		Cost (2007$)[2]									
		Bulk Storage Containers	Loading Racks	Mobile/ Portable Storage Containers	Spill Kits	Piping[3]	Transfer Areas	Flowlines[4]	Intra-Facility Gathering Lines	Oil-Filled Equipment	Total[5]
Storage	Category I	$10,500	N/A	$2,020	$850	$1,060	$6,700	N/A	N/A	$4,500	$25,700
	Category II	$21,500	$6,140								$42,700
	Category III	$95,400	$12,300		$1,700	$6,050					$129,000
	Category IV	$227,200	$18,400		$2,550	$8,860					$270,000
Production	Category I	$10,500	N/A	N/A	$550	$3,900	$6,700	$1,010	$833	$1,500	$25,000
	Category II	$19,700						$2,020	$2,500		$36,800
	Category III	$53,700				$44,800		$4,030			$114,000
	Category IV	$282,000				$46,800		$6,060	$15,000		$359,000

1 Applies to new facilities only, because existing facilities have already installed appropriate secondary containment.
2 Ranges of cost estimates depend on method/type of construction and on size of containment required. In addition, impracticability determination cost varies according to whether a facility hires a professional engineering firm or uses in-house labor.
3 Category III and IV facilities choose to determine that secondary containment for some of their piping is impracticable.
4 All production facilities choose to determine that secondary containment for flowlines is impracticable.
5 Totals may not sum correctly due to rounding.

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All of the estimates presented in Exhibit 5-9 except for Piping, Flowlines, Oil-Filled Equipment, and Intra-Facility Gathering Lines (at Category I, II, and III facilities) are the average of a range of estimates developed by EPA. Exhibit 5-10 presents ranges for the baseline cost of secondary containment for bulk storage containers. EPA received inputs on cost estimates for secondary containment from Richard Franklin of EPA Region 6, who estimates that an earthen berm around a single container or a heater-treater costs approximately $900 to $1,000.[60] EPA's estimates that have been used in this analysis are based on a containment structure around a tank battery, which is likely to cost more than that for a single container. Further, for facilities with smaller storage capacities, the unit cost inventory reports an estimate of $1,300 for a sized secondary containment structure, which is close to the estimate provided by Richard Franklin. The estimates presented in this RIA reflect the cost of concrete sized containment structures that are likely to be used around tank batteries. In the cost impact analysis, EPA used an average value between the cost of earthen and concrete structures, assuming that approximately 50 percent of the facilities use either kind of material.

The estimated ranges for providing secondary containment for other equipment and the contributing factors are as follows:

- Loading racks: ranges from $570 (using asphalt curbing) to $11,700 (using concrete berms) per loading area.
- Mobile or portable storage containers: ranges from $270 (using asphalt curbing) to $3,775 (using concrete berms) per facility.
- Spill kits: $100 to $1,000. Storage facilities require one spill kit per loading area, in addition to a drain cover ($100 to $500).
- A transfer area: ranges from $4,530 to $8,570, depending on the size and type (manual/automatic) of doorway spill barrier installed.
- Intra-facility gathering lines at Category IV facilities: ranges from $10,000 to $20,000, depending on the length of the lines.

[60] Personal communication with Richard Franklin, Federal On-Scene Coordinator for EPA Region 6. 2007.

Exhibit 5-10
2002 Baseline Cost Range for Secondary Containment for Bulk Storage Containers (New Facilities)[1]

Type of Facility		Cost (2007$)[2]	
		Earthen Berms	Concrete Berms
Storage	Category I	$1,320 - $3,300	$3,300 - $19,800
	Category II	$4,650 - $7,320	$23,000 - $38,300
	Category III	$10,100 - $39,400	$40,200 - $181,000
	Category IV	$65,700 - $85,000	$308,000 - $389,000
Production	Category I	$1,320 - $3,300	$3,270 - $19,800
	Category II	$4,320 - $6,000	$23,000 - $35,000
	Category III	$10,100 - $21,200	$40,200 - $97,200
	Category IV	$85,000 - $106,000	$389,000 - $480,000

1 Applies to new facilities only, because existing facilities are assumed to have already installed appropriate secondary containment.

2 Ranges of cost estimates depend on method/type of construction and on size of containment required. In addition, impracticability determination cost varies according to whether a facility hires a professional engineering firm or uses in-house labor.

5.2.1.3 Inspections and Testing Requirements

Sections 112.8(c)(6) and 112.12(c)(6) require the integrity testing of bulk storage containers at storage facilities on a regular schedule and whenever material repairs are done. Under the SPCC rule, the integrity testing requirement does not apply to production facilities. Section 112.7(d) requires that if the installation of secondary containment is not practicable, the owner or operator must, among other measures, conduct periodic integrity tests for bulk storage containers and periodic integrity and leak testing of associated valves and piping. In addition to integrity testing requirements, the following inspection types are required by the SPCC rule:

- *Storage facilities:* All of the following compliance activities must be conducted monthly: inspect the lowermost drain and all outlets (if a loading rack is present at the facility) (§112.7(h)(3)); evaluating field-constructed containers for risk of brittle fracture (§112.7(i)); inspect pumps, ejectors, dikes, and containers for oil discharge (§§112.8(b)(1) and 112.12(b)(1)); monitor the steam return and exhaust lines for contamination (§§112.8(c)(7) and 112.12(c)(7)); test liquid level sensing devices (§§112.8(c)(8)(v) and 112.12(c)(8)(v)); inspect piping for deterioration and corrosion (§§112.8(d)(1) and 112.12(d)(1)); inspect all aboveground valves, piping and appurtenances (§§112.8(d)(4) and 112.12(d)(4)); and observe effluent treatment facilities frequently enough to detect possible system upsets (§112.8(c)(9)).

- *Production facilities:* All of the following compliance activities must be conducted monthly: inspect the lowermost drain and all outlets (if a loading rack is present at the facility) (§112.7(h)(3)); inspect oil traps sumps and skimmers for oil that may have come from a discharge and removing accumulated oil (§112.9(b)(2)); periodically visually inspect each containment for oil including the foundation and support area on or above the surface of the ground (§112.9(c)(3)); inspect saltwater

disposal facilities (§112.9(d)(2)); inspect diked areas (§112.9(b)(1)); inspect all aboveground valves and piping associated with transfer operations (§112.9(d)(1)).

5.2.1.4 Cost Estimates for Inspections and Testing

EPA estimated the cost of conducting external integrity testing per event at approximately $500 to $1,000 for Category I storage facilities, $2,000 to $4,000 for Category II facilities, $4,000 to $8,000 for Category III facilities, and $8,000 to $40,000 for Category IV facilities (Exhibit 5-10).[61] These estimates were based on a unit cost of external integrity testing for all types of facilities of $500 to $1,000 per tank from EPA's unit cost inventory analysis.[62] EPA also estimated the cost of hydrostatic testing per event at approximately $500 to $2,500 for Category I storage facilities, $2,000 to $10,000 for Category II facilities, $4,000 to $20,000 for Category III facilities, and $8,000 to $40,000 for Category IV facilities (Exhibit 5-11). These estimates were based on a unit cost of $500 to $2,500 per tank. The cost of performing integrity testing could vary significantly depending on the container type, capacity, type of oil, and other site-specific factors. EPA assumed integrity testing of these containers would be conducted once every 12 years.[63]

The 2002 SPCC rule allows the use of environmentally equivalent measures in lieu of inspection and integrity testing, consistent with good engineering practice. Such measures may have lower operational costs. For example, for shop-built containers with a shell capacity of 30,000 gallons or under, an environmentally equivalent measure might be to combine appropriate visual inspection with elevation of the container such that all sides are visible and corrosion is minimized. As a result, EPA's analysis may overestimate the cost of integrity testing incurred by an owner or operator of an average facility.

[61] EPA assumed that the number of tanks per typical facility would be 1, 4, 8, and 16 for Category I, II, II, and IV facilities, respectively.

[62] The estimate was based on cost estimates provided by SCS Engineers in February 2007.

[63] This assumption is based on inputs from facility visits that suggest that facilities typically conduct integrity testing every 10-15 years. EPA used the midpoint of this range.

Exhibit 5-11
Baseline 2002 Facility-Level Integrity Testing Costs (New & Existing Storage Facilities)[1]

Type of Facility	Annual Equivalents, Integrity Testing Costs (2007$)						
	Aboveground Storage Tanks	Buried Storage Tanks	Buried Piping[2]		Field-Constructed Containers	Total[3]	
			New Facilities	Existing Facilities		New Facilities	Existing Facilities
Category I	$125	$375	N/A	N/A	N/A	$500	$500
Category II	$500		$57	$80		$932	$955
Category III	$1,000		$114	$179	$238	$1,490	$1,500
Category IV	$2,000					$2,490	$2,550

1 EPA assumed that most integrity tests would be conducted once every 12 years, and that field-constructed containers would be tested every 20 years. Unit costs range from $500 to $2,500 per tank for hydrostatic testing and $500 to $1,000 for external testing. EPA assumed that the number of tanks per typical facility would be 1, 4, 8, and 16 for Category I, II, II, and IV facilities, respectively. This assumption was based on estimates obtained from SCS Engineers as well as state oil tank databases. EPA also assumed that Category I facilities would have no buried piping and that Category I and II facilities would have no field-constructed containers, based on estimates from SCS Engineers.

2 Estimates actually represent the average a range of values for testing buried piping, depending on the length of piping. For Category II facilities, this cost could range from $38 to $76 for new facilities and from $47 to $113 for existing facilities. For Category III facilities, this cost could range from $76 to $152 for new facilities and from $113 to $245 for existing facilities.

3 Totals may not sum correctly due to rounding.

In addition to integrity testing requirements for storage tanks, the SPCC rule requires owners or operators of regulated storage facilities to conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement. EPA assumed that Category I storage facilities would not have any buried piping; Category II facilities would have 50 feet of buried piping per facility; and Category III & IV facilities would each have 500 feet of buried piping per facility.[64] EPA estimated that the labor burden associated with conducting integrity and leak testing for buried piping would be higher for existing facilities than for new facilities. EPA assumed that the estimated costs of integrity testing for buried piping, per event, would be $0, $57, and $114 for new Category I, Category II, and Category III & IV facilities, respectively. For existing facilities, EPA estimated these costs at $0, $80, and $179, respectively. EPA assumed these tests would be conducted once every 12 years (Exhibit 5-11).

The SPCC rule also stipulates leak-testing requirements for completely buried metallic storage tanks at storage facilities. EPA assumed Category I facilities would have no completely buried storage tanks, and Category II, III, & IV facilities would each have a 1,000 gallon buried tank and a 10,000 gallon buried tank. EPA estimated the cost for Category II, III, & IV facilities to be $4,500 per testing event. As with other integrity testing requirements, EPA assumed leak testing of buried storage tanks would be conducted once every 12 years (Exhibit 5-11).

Finally, the SPCC rule requires the brittle-fracture evaluation of field-constructed storage containers at storage facilities. EPA assumed that only Category III and IV facilities will have field-constructed containers, due to their size. EPA estimated the cost of brittle-fracture

64 These assumptions are based on inputs from SCS engineers for an illustrative facility. The actual number of feet of buried piping at different facilities is likely to vary.

evaluation for 20,000-gallon containers at $4,750 per event, and assumed that this procedure will be conducted once every 20 years (Exhibit 5-11).

Other than integrity testing costs, all the testing and inspection costs are incurred monthly, by both new and existing facilities.[65] For storage facilities, the monthly inspection and testing costs include estimates for inspecting the lowermost drain and all outlets; inspecting pumps, ejectors, dikes, and containers for oil discharge; monitoring the steam return and exhaust lines for contamination; testing liquid level sensing devices; inspecting piping for deterioration and corrosion; and inspecting all aboveground valves, piping and appurtenances. For production facilities, the monthly inspection and testing costs include inspecting the lowermost drain and all outlets; inspecting oil traps, sumps, and skimmers; periodically visually inspecting each containment for oil; inspecting saltwater disposal facilities; inspecting diked areas; and inspecting all aboveground valves and piping associated with transfer operations. The cost estimates associated with monthly inspections and testing are presented in Exhibit 5-12.

Exhibit 5-12
Baseline 2002 Monthly Inspection and Testing Costs (New & Existing Facilities)[1]

Type of Facility		Cost (2007$)	
		Monthly Cost	Annual Equivalent Cost
Storage	Category I	$255	$3,060
	Category II	$515	$6,780
	Category III	$1,560	$18,700
	Category IV	$2,800	$33,600
Production	Category I	$161	$1,930
	Category II	$322	$3,860
	Category III	$643	$7,720
	Category IV	$965	$11,600

[1] Please see Section 5.2.1.4 for a description of required monthly inspections and testing procedures.

The costs presented above for monthly inspection and testing costs for storage facilities incorporate the average of a range of estimates for testing liquid level sensing devices; the number of liquid level sensing devices depends upon the number of tanks at a facility, and the testing costs associated with those ranges are shown in Exhibit 5-13.

[65] In reality, there could be a variation in what facilities do to comply with SPCC requirements, but EPA's site visits and inputs from SCS Engineers suggest that these inspections would be done monthly. Another issue is the extent to which facilities might be undergoing inspections and testing because of industry standards. In which case, these costs would not accrue to SPCC. However, as mentioned in Chapter 3, EPA does not account for industry standards because of the lack of data on the extent to which facilities adopt industry standards.

Exhibit 5-13
Baseline 2002 Liquid Level Sensing Device Testing Costs (New & Existing Storage Facilities)

Type of Facility		Cost (2007$)	
		Monthly Cost	Annual Equivalent Cost
Storage	Category I	$54	$643
	Category II	$107 - $214	$1,290 - $2,570
	Category III	$322 - $858	$3,860 - $10,300
	Category IV	$1,290 - $1,720	$15,400 - $20,600

5.2.1.5 Other Capital and O&M Activities

EPA estimated costs associated with other major compliance activities. These costs consist of one-time initial costs of purchasing and installing equipment (incurred only by new facilities) as well as costs of ongoing maintenance, upkeep, and training (incurred by both new and existing facilities). These compliance activities include:

- *Anti-Corrosive Measures.* These activities apply only to storage facilities, as the requirement is not applicable to production facilities. They include providing coatings or cathodic protection to protect partially buried tanks from corrosion (§§112.8(c)(4) and 112.12(c)(4) and §§112.8(c)(5) and 112.12(c)(5)); providing coatings or cathodic protection to protect buried piping from corrosion (§§112.8(d)(1) and 112.12(d)(1); and designing pipe supports to minimize abrasion and corrosion and allow for expansion and contraction (§§112.8(d)(3) and 112.12(d)(3)).

- *Drainage Measures.* These measures include providing drainage systems for associated tank truck loading/unloading areas or loading racks if a loading rack is present at the facility (§112.7(h)(1)). For storage facilities, compliance activities also include restraining drainage from diked storage areas and designing facility drainage systems from undiked areas with a potential for discharge (§§112.8(b)(2) and 112.12(b)(2) and §§112.8(b)(3) and 112.12(b)(3), respectively).

- *Security Measures.* These activities apply only to storage facilities, as the requirement is not applicable to production facilities. They include fully fencing the facility or just oil storage/transfer areas (§112.7(g)(1)); providing adequate security measures for valves (§112.7(g)(2)); locking the starter control for each oil pump at a site accessible only to authorized personnel (§112.7(g)(3)); complying with security requirements for piping (e.g. securely cap piping connections) (§112.7(g)(4)); and providing facility lighting to help discover discharges and prevent vandalism (§112.7(g)(5)).

- *Training.* Section 112.7(f)(1) requires oil-handling personnel to be trained in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general

facility operations; and the contents of the facility SPCC Plan. Section 112.7(f)(2) requires each facility to designate a person accountable for discharge prevention. Section 112.7(f)(3) requires owners and operators to schedule and conduct discharge prevention briefings for facility personnel to ensure adequate understanding of the SPCC Plan.

- *Other Measures.* For storage facilities, these measures include installing liquid level sensing devices (§§112.8(c)(8) and 112.12(c)(8)); equipping the final discharge of ditches inside the facility with a diversion system (§§112.8(b)(4) and §112.12(b)(4)); warning all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations (§§112.8(d)(5) and 112.12(d)(5)); and providing two pumps if the facility has drainage waters treated in more than one treatment unit continuously (§§112.8(b)(5) and 112.12(b)(5)). Production facilities are required to have a program of flowline maintenance to prevent discharges from each flowline (§112.9(d)(3)).

5.2.1.6 Cost Estimates for Other Capital and O&M Activities

This section presents cost estimates for other capital and O&M compliance activities affected by the final amendments. The requirements vary between storage and production facilities.

Exhibit 5-14 presents the estimated cost of providing anti-corrosive measures at a typical storage facility. These are one-time capital costs that EPA assumed would be incurred in the first year of operations. Therefore, only new facilities incur these costs.

Exhibit 5-14
2002 Baseline Capital Costs of Anti-Corrosive Measures (New Storage Facilities)[1]

Type of Facility	Cost (2007$)			
	Partially or Fully Buried Tanks[2]	Buried Piping[3]	Pipe Supports[4]	Total[5]
Category I	$5,460	N/A	$690	$6,150
Category II		$1,320		$7,470
Category III		$6,010	$14,375	$25,800
Category IV			$21,600	$33,100

1 The requirement is not applicable to production facilities.

2 Provide coatings for one 1,000 and one 10,000-gallon tank, both either partially or fully buried. $5,460 is the average cost; protection would cost $3,640 for partially buried tanks, and double this ($7,280) for fully buried tanks.

3 Provide coatings. Depending on the length of piping, cost ranges from $297 to $908 for Category II; and from $908 to $2,270 for Category III and IV. In addition, facilities could utilize the American Petroleum Institute (API) 570 inspection program ($1,630 for Category II and $4,040 for Category III and IV) or install double wall fiberglass fuel piping ($2,110 and $11,100, respectively) as environmental equivalence. Cost presented is the mean of the low and high estimate for compliance with this measure, overall.

4 Design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction. Cost ranges from $5 to $225 per pipe support (needed every 8 feet).

5 Totals may not sum correctly due to rounding.

Exhibit 5-15 presents the estimated cost of providing drainage measures at a typical facility.

Exhibit 5-15
2002 Baseline Capital Costs of Drainage Measures (New Facilities[1])

Type of Facility		Cost (2007$)[2]			
		Loading Rack[3]	Diked Storage Areas[4]	Production/ Separation Area[5]	Total[6]
Storage	Category I	N/A	$5,240	N/A	$5,240
	Category II	$4,160			$9,400
	Category III		$10,500		$14,600
	Category IV		$15,700		$19,900
Production	Category I	N/A	N/A	$232	$232
	Category II				
	Category III			$464	$464
	Category IV			$695	$695

1 Applies to new facilities only, because existing facilities have already installed appropriate drainage measures.
2 Range of cost estimates determined by facility's decision to hire a professional engineering firm or use in-house labor and by choice of drainage system.
3 Facilities are required to use a quick drainage system for loading/unloading areas where drainage does not flow into a catchment basin or treatment facility. Production facilities and Category I non-production facilities are assumed not to have a loading rack.
4 Facilities are required to use valves of manual, open-and-closed design, for the drainage of diked storage areas. This cost, per drainage area, ranges from $480 for a manual valve up to $10,000 for a hydrophobic/oleophilic drain shutoff system.
5 Production facilities are required to design production/separation area drainage to flow into drainage ditches. Drains are required to be closed and sealed at all times except when draining rainwater.
6 Totals may not sum correctly due to rounding.

Security costs for new storage facilities are summarized in Exhibit 5-16. As per the SPCC requirement, these costs do not apply to production facilities. These are one-time capital costs that EPA assumed would be incurred in the first year of operations. Therefore, only new facilities incur these costs. EPA estimated capital security costs to be same for Category I and Category II facilities, which must meet certain baseline capital requirements. EPA estimated security costs to be substantially greater for Category III and Category IV facilities, which are significantly larger in size and complexity.

Exhibit 5-16
Baseline 2002 Security Costs (New Storage Facilities)

Type of Facility	Cost (2007$)				
	Facility Fencing[1]	Facility Lighting	Security Measures for Valves	Security Measures for Piping[2]	Total Security Cost[3]
Category I	$4,290	$2,240	$410	$154	$7,100
Category II	$4,900				$7,710
Category III	$17,800	$22,400	$1,360	$680	$42,200
Category IV	$27,300	$33,600	$2,040	$922	$63,900

1 Estimates are for fencing only oil storage/transfer areas.
2 Security measures for piping could also be incurred by existing facilities; other security measures only apply to new facilities.
3 Totals may not sum correctly due to rounding.

Exhibit 5-17 details costs associated with training facility workers. These costs are ongoing costs and incurred by both new and existing facilities. The costs vary depending on whether the training activities are conducted by in-house personnel or by a professional engineering firm.

Exhibit 5-17
Baseline 2002 Annual Training Costs (New & Existing Facilities)[1]

Type of Facility		Cost (2007$)			
		Training for Facility Personnel	Discharge Prevention Briefings	Train Person Responsible for Discharge Prevention	Total Training Cost[2]
Storage and Production	Category I	$1,110	$717	$107	$1,930
	Category II	$2,160	$1,390		$3,650
	Category III				
	Category IV				

1 The costs presented are an average of the cost incurred by using in-house personnel to conduct training or hiring a professional engineering firm.
2 Totals may not sum correctly due to rounding.

Exhibit 5-18 presents the compliance costs required for storage facilities not elsewhere presented.

Exhibit 5-18
Baseline 2002 Other Costs (New Storage Facilities)

Type of Facility	Cost (2007$)			
	Install Liquid Level Sensing Devices[1]	Equip with Diversion System[2]	Vehicle Warning[3]	Provide Two Pumps[4]
Category I	$12,000	$1,240	$2,600	$191
Category II				
Category III	$24,000	$2,420	$5,420	
Category IV	$36,000	$6,100	$8,110	

1 Depending on the type of liquid level sensing device installed, the cost per loading area can range from $2,400 (for a magnetorestrictive fuel monitoring system for inventory purposes) to $21,600 (for a Scully Signal system). Costs presented here are an average.
2 Equip the final discharge of ditches inside the facility with a diversion system (§§112.8(b)(4) and §112.12(b)(4)).
3 Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations (§§112.8(d)(5) and 112.12(d)(5)). Ranges from a minimum of $200 per storage area for warning signs to a maximum of $5,000 for bollards at Category I and II facilities, or up to $7,380 for guard rails at Category III and IV facilities. Costs presented are an average.
4 Provide two pumps if the facility has drainage waters treated in more than one treatment unit continuously (§§112.8(b)(5) and 112.12(b)(5)).

Exhibit 5-19 and Exhibit 5-20 present the estimated total cost of compliance with SPCC requirements for generic storage and production facilities, by storage capacity size category.

Exhibit 5-19
Baseline 2002 Costs for All Compliance Measures (New Facilities)

Facility Type		Cost (2007$)									
		Plan Preparation and Maintenance[1]	Secondary Containment[2]	Integrity Testing[3]	Monthly Inspections[4]	Anti-Corrosive[5]	Drainage[6]	Security[7]	Training[8]	Other[9]	Total[10]
Storage	Category I	$7,080	$25,660	$500	$3,060	$6,150	$5,240	$7,100	$1,930	$16,000	$73,100
	Category II	$13,800	$42,700	$932	$6,180	$7,470	$9,400	$7,710	$3,650		$108,000
	Category III	$19,800	$129,000	$1,490	$18,700	$25,800	$14,600	$42,200		$32,000	$287,000
	Category IV	$28,900	$270,000	$2,490	$33,600	$33,100	$19,900	$63,900		$50,400	$507,000
Production	Category I	$4,590	$25,024	N/A	$1,930	N/A	$232	N/A	$1,930	$3,930	$37,600
	Category II	$8,870	$36,800		$3,860				$3,650	$5,000	$58,400
	Category III	$17,400	$113,762		$7,720		$464				$148,000
	Category IV	$26,000	$359,123		$11,600		$695			$9,830	$411,000

1 For more details, refer to Exhibit 5-1 through Exhibit 5-8.
2 For more details, refer to Exhibit 5-9 and Exhibit 5-10.
3 For more details, refer to Exhibit 5-11.
4 For more details, refer to Exhibit 5-12 and Exhibit 5-13.
5 For more details, refer to Exhibit 5-14.
6 For more details, refer to Exhibit 5-15.
7 For more details, refer to Exhibit 5-16.
8 For more details, refer to Exhibit 5-17.
9 For more details on other measures for storage facilities, refer to Exhibit 5-18. For production facilities, this cost reflects the cost of a flowline maintenance program.
10 Totals may not sum correctly due to rounding.

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Exhibit 5-20
Baseline 2002 Costs for All Measures (Existing Facilities)

Facility Type		Cost (2007$)									
		Plan Preparation and Maintenance[1]	Secondary Containment[2]	Integrity Testing[3]	Monthly Inspections[4]	Anti-Corrosive[5]	Drainage[6]	Security[7]	Training[8]	Other[9]	Total[10]
Storage	Category I	$929	$0	$500	$3,060	$0	$0	$154	$1,930	$0	$6,570
	Category II	$1,700		$955	$6,180				$3,650		$12,600
	Category III	$2,570		$1,550	$18,700			$680			$27,200
	Category IV	$3,920		$2,550	$33,600			$922			$44,700
Production	Category I	$453	$0	N/A	$1,930	N/A	$0	N/A	$1,930	$751	$5,210
	Category II	$691			$3,860				$3,650	$1,820	$10,300
	Category III	$1,170			$7,720						$14,900
	Category IV	$1,640			$11,600					$6,650	$24,400

1 For more details, refer to Exhibit 5-1 through Exhibit 5-8.
2 For more details, refer to Exhibit 5-9 and Exhibit 5-10.
3 For more details, refer to Exhibit 5-11.
4 For more details, refer to Exhibit 5-12 and Exhibit 5-13.
5 For more details, refer to Exhibit 5-14.
6 For more details, refer to Exhibit 5-15.
7 For more details, refer to Exhibit 5-16.
8 For more details, refer to Exhibit 5-17.
9 For more details on other measures for storage facilities, refer to Exhibit 5-18. For production facilities, this cost reflects the cost of a flowline maintenance program.
10 Totals may not sum correctly due to rounding.

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5.3 Final Alternative Requirements for Tier I Qualified Facilities

In its amendments to the SPCC rule, EPA is providing additional flexibility for facilities with capacity less than or equal to 10,000 gallons and no containers greater than 5,000 gallons or, in the alternate option, for facilities with aggregate storage capacity less than 5,000 gallons. A qualified facility would be a facility subject to the SPCC rule that, as described in §112.3(g), meets the storage capacity threshold and discharge history criteria. For qualified facilities in either option, EPA is amending §112.6 to describe the requirements that a regulated facility must meet in order to comply with the SPCC rule. This option allows an owner/operator to fill out an SPCC Plan template to serve as his or her SPCC Plan. New activities introduced by the revision include the following:

- Assessing aboveground storage tanks for potential discharge on a regular basis or whenever changes are made.
- Providing each container with a system or documented procedure to prevent overfills.
- Developing a flowline maintenance program to prevent discharges from each flowline (applies to production facilities only).
- Filling out the SPCC Plan template.
- Developing a program of integrity testing and inspections of bulk storage containers.

EPA estimated the number of burden hours for each requirement by contacting nine PEs and asking them a series of questions regarding potential costs associated with complying with the new requirements.[66] EPA chose to contact PEs because of their expertise with the SPCC requirements within a wide range of industry sectors. EPA calculated a simple mean of the reported values to estimate the technical burden hours necessary to complete each task. Based on the requirements, only technical personnel are expected to perform the work associated with the required activities. EPA estimated the cost for performing each of the activities by multiplying burden hours by the hourly wage rate for the facility's technical personnel. Exhibit 5-21 presents the list of activities for qualified facilities, and associated labor burden and estimated costs.

[66] The contacted individuals were: Catherine Skurow, PE at CAS Engineering Services Inc.; Brian Morrill, PE at GZA GeoEnvironmental Inc.; Karen Townsend, PE at Woodard and Curran; Mary Hess, PE at Anvil Corporation; Pat Barsanti, PE at SHN Consulting Engineers and Geologists; John Cwiklewski, PE at Honda of America Manufacturing Inc.; Randy Tomic, PE at Growmark Inc.; William Noel, PE at STS Consultants; and Steven Gruhn, PE at Hart Growser.

Exhibit 5-21
Estimated Costs to Tier I Qualified Facilities Introduced by the Final Amendment

Template SPCC Plan Elements	Total Hours[1]	Cost ($/Year) ($52/hr)
Assess Potential for Discharge	1.07	$57.2
Provide Systems or Procedures for Preventing Overfills	0.86	$46.0
Develop Flowline Maintenance Program[2]	8.00	$429
Develop Integrity Testing Program	0.86	$46.0
Fill out SPCC Plan Template	0.09	$4.7
Total Cost - Storage Facility (98.9% of qualified facilities)	**2.87**	**$154**
Total Cost - Production Facility (1.1% of qualified facilities)	**10.90**	**$583**
Total Cost – Weighted Average		**$157**

[1] All hours are for technical personnel.
[2] Applies to production facilities only.

5.4 State Overlap

Each state has its own regulations regarding the storage, handling, and containment of oil. In some cases, the effort required by these state regulations may be similar to or the same as what is required by the SPCC rule (e.g., Alaska, California, Colorado, Delaware, Georgia, Hawaii). Without taking into account similar requirements imposed by state regulations, the cost of compliance and cost savings associated with the regulatory changes could be overestimated.

The economic analysis of the 2002 SPCC rule attempted to account for overlap between the state requirements and that rule. The analysis revealed that 19 states had prevention planning requirements pursuant to state law. In certain cases, state regulations closely track or incorporate by reference federal SPCC requirements. In other cases, the degree of overlap is less complete but is still substantial. Based on a comparison of state regulations with a list of major SPCC planning requirements, EPA divided the 19 states into three overlap groups (complete, substantial, or partial), depending on the degree of overlap between the federal and state requirements. Based on the findings from the 19 states, EPA developed a nationwide estimate for the degree of overlap between federal and state requirements. Exhibit 5-22 presents the estimated percentage reduction in total burden attributed to overlap in requirements between the SPCC rule and state regulations.

Exhibit 5-22
Estimated Percentage Reduction in Total Burden due to State Overlap

Degree of Overlap	Categories I and II	Category III	Category IV	Total
Complete Overlap	4.4%	11.2%	15.1%	5.9%
Substantial Overlap	3.1%	7.8%	10.8%	4.2%
Partial Overlap	2.1%	5.3%	7.6%	2.8%
Total	**9.6%**	**24.2%**	**33.4%**	**13.0%**

Source: Economic Analysis for the 2002 SPCC rule

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As part of the regulatory analysis for the 2008 final SPCC amendments, EPA studied the overlap of state regulations to determine whether an adjustment of the estimate would more accurately account for recent changes in state requirements and/or refine the previously generated estimates. As a result of this review, the Agency concluded that there was not compelling evidence to adjust the overlap estimate between the SPCC rule and existing state regulations. When assessing cost savings resulted from the reduced SPCC requirements, EPA takes into account the estimated degree of overlap to avoid double counting. The reduced burden due to state overlap was estimated by applying the percentages presented in Exhibit 5-22 to the total burden associated with each paperwork compliance activity.

5.5 Annualizing Estimated Changes in Compliance Costs

Changes in compliance costs presented in subsequent chapters (Chapter 6) are estimated in annualized net present values over a 10-year period. First, EPA calculated the net present value of a projected stream of future cost savings in 2010 using the 3 percent and 7 percent discount rates.[67] EPA defined the 10-year period of analysis as 2010 through 2019. The net present value of a projected stream of cost savings is calculated by multiplying the estimated savings in each year by a time-dependent weight, dt, and adding all of the weighted values as follows:

Net Present Value

$$NPV = NB_0 + d_1NB_1 + d_2NB_2 + \ldots + d_nNB_n$$

where,

NB_t is the net benefits that accrue at the end of period, t, and the discounting weights are given by:

$$d_t = 1/(1+r)^t$$

where r is the discount rate, and n is the last year of the analysis.

After the present value of costs is calculated using the NPV formula above, this present value is then annualized according to the following formula:

[67] These discount rate values reflect guidance from the Office of Management and Budget regulatory analysis guidance document, Circular A-4. OMB, September 17, 2003, OMB Circular A-4, p. 33-34. Available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

Annualized Cost Saving

$$AC = PVC \times \frac{r \times (1+r)^n}{(1+r)^n - 1}$$

where,

AC = annualized cost accrued at the end of each of *n* periods

PVC = present value of costs

r = the discount rate per period

n = the analysis period.

Note that the annualized cost is the amount one would have to pay at the end of each period to add up to the same cost in present value terms as the stream of costs being annualized.[68]

[68] U.S. EPA, September 2000, "Analysis of Social Discounting," Chapter 6, *Guidelines for Preparing Economic Analyses*.

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Chapter 6

Compliance Costs and Savings by Rule Component

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6 Compliance Costs and Savings by Rule Component

The following sections present the estimated cost savings for each of the key final amendments and the alternative options considered by the Agency, including the alternative option of no action. EPA calculated cost savings only for cases that are expected to result in non-negligible cost savings[69]; for the other final amendments or options that do not have a cost impact, there is a discussion of the reasons EPA expects that the option would not result in a cost impact.

6.1 Hot-mix Asphalt

Hot-mix asphalt (HMA) is a mixture of asphalt cement and aggregate material (e.g., stone, sand or gravel), which is formed into final paving products for use on roads and parking lots. All types of asphalt, including hot-mix asphalt, are petroleum oil products. As a result, a facility with hot-mix asphalt may currently be regulated under the SPCC rule, if applicability criteria are met (e.g., storage capacity thresholds and potential for a discharge into navigable waters or adjoining shorelines), and secondary containment and other SPCC requirements would apply to the hot-mix asphalt containers.

EPA is revising the rule to exempt HMA from SPCC rule applicability so that the capacity of storage containers solely containing HMA is not counted toward the facility's oil storage capacity calculation. EPA is taking this action based on the fact that this material is unlikely to flow as a result of the entrained aggregate, such that there would be very few circumstances in which a discharge of HMA would have the potential to reach navigable waters or adjoining shorelines. EPA would continue to regulate asphalt cement, asphalt emulsions, and cutbacks that are not hot-mix asphalt. However, hot-mix asphalt manufacturers and other facilities that use, store, distribute, or otherwise handle hot-mix asphalt may still be subject to SPCC requirements due to their storage capacity of other types of oils.

6.1.1 Universe of Affected Facilities

Facilities within two NAICS industry sectors are expected to store hot-mix asphalt (see Exhibit 6-1). Facilities in the "Asphalt Paving Mixture and Block Manufacturing" and "Asphalt Shingle and Coating Materials Manufacturing" sectors primarily handle hot-mix asphalt.

Exhibit 6-1
Industry Categories with Hot-mix Asphalt Storage

NAICS Sector	NAICS Name	HMA as Output	HMA as Input	Number of Facilities	Percent of Total
324121	Asphalt Paving Mixture and Block Manufacturing	X		3,350	93%
324122	Asphalt Shingle and Coating Materials Manufacturing	X		242	7%
Total				3,590	100%

[69] Appendix J in Volume II provides the step-by-step cost calculations for each of the issues that result in a cost impact.

The estimate was based on queries performed on EPA's Envirofacts database, which contains data on permits held by asphalt facilities under the Clean Air Act. The estimation was part of a 2005 analysis characterizing the applicability of the SPCC rule to the asphalt industry. To verify the obtained estimates, EPA researched readily available data sources. As a result, EPA estimated a universe of approximately 3,590 active asphalt plants that store hot-mix asphalt in the United States, based on data obtained from the Emission Factor Documentation for asphalt plants.[70] This finding was consistent with the previously estimated number of asphalt facilities by EPA. Facilities in the "Asphalt Paving Mixture and Block Manufacturing" sector represent the largest fraction of all asphalt facilities (93 percent).

6.1.1.1 Distribution of Facilities by SPCC Size Category

Since the cost impact of the change on the affected facilities is likely to vary by the facility capacity storage, the Agency examined a sample of SPCC-regulated facilities to obtain information regarding the storage capacity distribution of asphalt facilities. EPA analyzed information from the eight state databases (Florida, Kansas, Maryland, Minnesota, New York, Oklahoma, Virginia, and Wisconsin) that were used to estimate the SPCC universe of regulated facilities as part of the regulatory impact analysis for the 2008 final amendments to the SPCC rule. EPA estimated the number of regulated asphalt facilities by capacity category for each of the three affected industry groups. The total number of affected facilities in the analyzed sample was 60. A key assumption employed (and used in the SPCC universe estimation process) is that those eight states are representative of the national universe of SPCC-regulated facilities. Given this assumption, the estimated size distribution is applicable to all regulated asphalt facilities. Exhibit 6-2 presents the distribution of asphalt facilities by storage capacity category. Most asphalt facilities (52 percent) fall under Category II, with the total storage capacity of 10,001 to 42,000 gallons. A total of 70 percent of all asphalt facilities have oil storage capacity of 42,000 gallons or less (Category I and Category II combined).

Since the determination of a reasonable expectation to discharge oil in quantities that may be harmful to navigable waters or adjoining shorelines is based on location (§112.1(b)), rather than the size of the facility, the Agency assumed that the distribution of size categories was similar across the facilities where the asphalt containers posed an imminent threat to navigable waters or adjoining shorelines.

Exhibit 6-2
Distribution of Asphalt Facilities by Capacity Category
(10-year Average)

Size Category	Number of Facilities	Percentage
Category I	709	18.3%
Category II	2,000	51.7%
Category III	903	23.3%
Category IV	258	6.7%
Total	**3,870**	**100%**

[70] RTI International, February 2004, "Hot-mix Asphalt Plants," Section 11.1, Emission Factor Documentation for AP-42, Final Report.

Exhibit 6-3 presents the total projected number of new and existing asphalt facilities from 2010 through 2019. The projected average annual number of new asphalt facilities is 69, and the number of existing asphalt facilities is 3,800. EPA projected the number of new and existing asphalt facilities over the 10-year analysis period using the estimated number of SPCC-regulated asphalt facilities and industry-specific growth rates.[71]

Exhibit 6-3
Projected Number of New and Existing Asphalt Facilities

	Number of Facilities Affected by the Preferred Option										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing Facilities	**3,700**	**3,720**	**3,740**	**3,770**	**3,790**	**3,810**	**3,830**	**3,860**	**3,880**	**3,900**	**3,800**
Category I	678	682	686	690	695	699	703	707	711	715	697
Category II	1,910	1,920	1,930	1,950	1,960	1,970	1,980	1,990	2,000	2,020	1,960
Category III	863	868	874	879	884	889	895	900	905	911	887
Category IV	247	248	250	251	253	254	256	257	259	260	253
New Facilities	**67**	**67**	**68**	**68**	**69**	**69**	**69**	**70**	**70**	**71**	**69**
Category I	12	12	12	13	13	13	13	13	13	13	13
Category II	35	35	35	35	35	36	36	36	36	37	36
Category III	16	16	16	16	16	16	16	16	16	17	16
Category IV	4	4	5	5	5	5	5	5	5	5	5

It is important to note that even though the final amendment exempts hot-mix asphalt containers from the SPCC requirements, facilities would still be subject to SPCC requirements if they store other types of oil. To estimate the effect of the final amendment on asphalt facilities, the Agency took the following steps:

- Analyzed three SPCC Plans obtained from EPA regions and data presented in air permits and on HMA equipment sales Web pages to estimate a fraction of the total oil storage capacity at a facility that accounts for HMA storage.[72] At both temporary and stationary plants, HMA accounted for approximately 34 percent of total storage, on average. The Agency assumed that this estimate is applicable to HMA facilities of all sizes.

- Assessed facility's potential movement across size categories based on reduced storage capacities caused by exempt HMA containers.[73] As a result, EPA estimated

[71] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

[72] Vulcan Asphalt, January 2005, SPCC Plan, Cordova, AL; Narragansett Improvement Company, May 2005, SPCC Plan, Providence, RI; Floyd Crim & Sons, November 2005, SPCC Plan, Asphalt plant, Manilla, IN. On-line information for the following facilities: Cedarrapids Bath Plant, Tetz Asphalt Plant, Pike Industries, Dufferin Construction.

[73] EPA considered a flat distribution of SPCC-regulated HMA facilities within each size category (e.g., in Category II, there would be the same number of HMA facilities with total storage of 10,000, 26,000, and 42,000 gallons).

that 30 percent of Category I facilities would drop out of the SPCC universe, 30 percent of Category II facilities would move one size category down and become Category I, 30 percent of Category III facilities would move one size category down and become Category II, and 60 percent of Category IV facilities would move one size category down and become Category III.

Exhibit 6-4 presents the estimated fraction of HMA facilities that would move across size categories as a result of the final amendment.

Exhibit 6-4
Percentage of HMA Facilities Expected to Move Across Size Categories

Size Category	Percentage of Facilities Exempt from SPCC	Percentage of Facilities that Move Down One Size Category
Category I	30%	-
Category II	-	30%
Category III	-	30%
Category IV	-	60%

Exhibit 6-5 presents the projected number of new and existing facilities affected by this amendment over the analysis period.

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Exhibit 6-5
Projected Number of New and Existing Facilities Affected by the Preferred Option of Exempting HMA Containers

Category	Number of Affected Facilities										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing[1]											
Category I	204	205	206	207	208	210	211	212	213	215	209
Category II	574	577	580	584	587	591	594	598	601	605	589
Category III	259	261	262	264	265	267	268	270	272	273	266
Category IV	148	149	150	151	152	152	153	154	155	156	152
New[2]											
Category I	7	7	7	7	8	8	8	8	8	8	8
Category II	21	21	21	21	21	21	21	22	22	22	21
Category III	9	9	9	10	10	10	10	10	10	10	10
Category IV	3	3	3	3	3	3	3	3	3	3	3

[1] The numbers are not rounded to three significant figures to show the variation of the estimates over the analysis period.
[2] The number of new affected facilities does not vary significantly across years.

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6.1.2 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA calculated the baseline cost of compliance for HMA facilities using the projected number of new and existing HMA facilities and the corresponding per-facility cost of compliance estimates before the final amendments (Exhibit 6-6). The per-facility compliance cost estimates (see Exhibit 6-7) are based on specific assumptions developed based on a review of five SPCC Plans, such as the number of tanks per facility by size category, the total capacity, and other facility characteristics, such as length of piping see Exhibit 6-8). EPA recognizes that there is wide variability in the characteristics of facilities across the United States. The facility-level costs, however, are calculated for illustrative purposes.

Exhibit 6-6
Annual Cost Impact of Exempting Hot-mix Asphalt (2007$)[1]

Size Category	Facility-level Cost Savings[2]		Cost Savings from Exempt Containers[3]	
	Existing[4]	New[4]	Existing	New
Category I	$6,030	$60,900	$653	$653
Category II	$10,900	$83,200	$2,070	$2,070
Category III	$23,800	$254,000	$6,860	$6,860
Category IV	$38,700	$463,000	$17,000	$17,000

1 The facility-level cost of compliance with the SPCC rule for a new facility is based on specific assumptions on the number of tanks, the total capacity and other facility characteristics. These costs are meant to be illustrative and not representative of average cost at a facility. The cost estimates do not take into account the adjustment for state overlap.

2 Cost savings for facilities that would be no longer subject to the SPCC rule.

3 Cost savings for facilities that stay within their size category.

4 Existing facilities would save on the recurring cost of compliance with the SPCC rule, while new facilities would save on the one-time capital costs and the recurring cost.

Exhibit 6-7
Annual Compliance Cost Estimate for Hot-mix Asphalt Facilities (2007$)[1]

Size Category	Facility-level Cost[2]	
	Existing	New
Category I	$6,030	$60,900
Category II	$10,900	$83,200
Category III	$23,800	$254,000
Category IV	$38,700	$463,000

1 The facility-level cost of compliance with the SPCC rule for a new facility is based on specific assumptions on the number of tanks, the total capacity and other facility characteristics. These costs are meant to be illustrative and not representative of average cost at a facility. The cost estimates do not take into account the adjustment for state overlap.

2 Existing facilities incur the recurring cost of compliance with the SPCC rule, while new facilities incur one-time capital costs and the recurring cost.

It is important to note that since certain SPCC requirements may be similar in nature to those imposed by state regulations, and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to

the SPCC rule. Since regulations vary widely across states and industries, there is no single adjustment factor that could be developed to address this issue for the universe of regulated facilities. However, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. As a result, the estimated compliance costs are likely to present an overestimate of the costs attributed to the SPCC rule. For details of the state overlap analysis, refer to Section 5.4 of this report.

Exhibit 6-8
Assumptions Used for Estimating Hot-mix Asphalt Facility Compliance Cost

Cost Item	Size Category							
	Category I		Category II		Category III		Category IV	
Labor Burden	Labor burden of certifying an existing SPCC Plan:							
	PE	6 hours	PE	12 hours	PE	24 hours	PE	36 hours
	Clerical worker	0.5 hour	Clerical worker	1 hour	Clerical worker	2 hours	Clerical worker	3 hours
Loading Racks	None		None		None		None	
AST Number & Size	(1) 1,000-gallon tank OR (1) 10,000-gallon tank		(1) 1,000-gallon tank + (1) 10,000-gallon tank OR (1) 1,000-gallon tank + (3) 10,000-gallon tanks		(3) 20,000-gallon tanks in a single containment area OR Area 1: (2) 25,000-gallon tanks + (3) 50,000-gallon tanks; Area 2: (3) 100,000-gallon tanks		4 containment areas, each with (3) 100,000-gallon tanks OR Area 1: (4) 25,000-gallon tanks + (2) 50,000-gallon tanks Area 2: (4) 50,000-gallon tanks + (1) 100,000-gallon tank Area 3: (5) 100,000-gallon tanks	
Total AST Capacity	1,000 – 10,000 gallons		11,000 – 31,000 gallons		60,000 – 500,000 gallons		1,000,000 – 1,200,000 gallons	
Partially Buried Tanks	None		None		None		None	
Total Tank Capacity	1,000 – 10,000 gallons		11,000 – 31,000 gallons		60,000 – 500,000 gallons		1,000,000 – 1,200,000 gallons	
AST Integrity Testing	Hydrostatic testing		Hydrostatic testing		Hydrostatic testing		Hydrostatic testing	
Underground Piping	None		50 - 200 feet 4" pipe		200 - 500 feet 4" pipe		200 - 500 feet 4" pipe	

EPA estimated that the baseline cost of compliance before the final amendments to the SPCC rule is $53.5 million and $53.4 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-9 presents the total annual compliance cost estimates for HMA facilities each year.

Exhibit 6-9
Projected Baseline Annual Compliance Cost for Facilities with Hot-mix Asphalt Containers (2007$ Millions)

	Compliance Costs											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$52.2	$52.5	$52.8	$53.1	$53.4	$53.7	$54.0	$54.4	$54.7	$55.0	**$536**	**$53.6**
3% Discounted	$50.6	$49.4	$48.3	$47.2	$46.1	$45.0	$43.9	$42.9	$41.9	$40.9	**$456**	**$53.5**
7% Discounted	$48.7	$45.8	$43.1	$40.5	$38.1	$35.8	$33.6	$31.6	$29.7	$28.0	**$375**	**$53.4**

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Compliance Cost Savings

EPA assumed that cost savings from the final amendment to exempt hot-mix asphalt containers from SPCC requirements would consist of the following:

- Cost savings for facilities moving down a capacity category that would imply lower cost of compliance and for facilities that would be no longer subject to SPCC requirements that would imply no cost of compliance (see Facility-level Cost Savings in Exhibit 6-6).
- Cost savings for facilities that do not move down a size category but incur lower costs from not having the hot-mix asphalt containers to comply with SPCC requirements (see Cost Savings from Exempt Containers in Exhibit 6-6).

The estimates for facility-level cost savings (see Exhibit 6-6) are based on specific assumptions developed from a review of five SPCC Plans, such as the number of tanks per facility by size category, the total capacity, and other facility characteristics, such as length of piping (see Exhibit 6-8). The cost savings estimates from exempt containers are based on the assumption of a reduced capacity by 34 percent due to removal of HMA tanks. EPA recognizes that there is wide variability in the characteristics of facilities across the United States. The facility-level costs, however, are calculated for illustrative purposes.

EPA calculated the total compliance cost savings for asphalt facilities using the projected number of new and existing asphalt facilities that would be affected by the amendments and their corresponding per-facility cost savings estimates, which are summarized in the equation below (see Appendix K in Volume II for more details on the calculation):

Calculation of Total Cost Savings

$$\text{Total Cost Savings} = \sum_{k=1}^{3}\sum_{j=1}^{2}\sum_{i=I}^{IV} NFac_{ijk} * NCostSaving_{ijk} * Overlap_i$$

where i = I, II, III, IV represents Category I, j = 1, 2 represents whether a facility is existing or new, and k = 1, 2, 3 represents if the facility is no longer subject to SPCC, moved down a size category, or stayed in its size category.

$NFac_{ijk}$ = the projected number of asphalt facilities in size category i, type j, after the proposed amendments with savings of type k (see Exhibit 6-5). EPA assumes that after the proposed amendment, 30 percent of the facilities in Category I would no longer be subject to the SPCC rule; 30 percent of the facilities in Category II would move to Category I; 30 percent of the facilities in Category III would move to Category II; and 60 percent of facilities in Category IV would move to Category III (see Exhibit 6-4).

$NCostSaving_{ijk}$ = Facility-level cost savings in size category i, type j, and with savings of type k (see Exhibit 6-6).

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22).

Using the equation above, EPA estimated that the final amendment to the SPCC rule would reduce compliance costs by $8.37 million and $8.36 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-10 presents the total annual cost savings for HMA facilities each year.

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Exhibit 6-10
Projected Annual Compliance Cost Savings from Exempting Hot-Mix Asphalt Containers (2007$ Millions)[1]

	Compliance Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$8.17	$8.21	$8.26	$8.31	$8.36	$8.41	$8.46	$8.51	$8.56	$8.61	**$83.9**	**$8.39**
3% Discounted	$7.93	$7.74	$7.56	$7.38	$7.21	$7.04	$6.88	$6.72	$6.56	$6.41	**$71.4**	**$8.37**
7% Discounted	$7.63	$7.17	$6.74	$6.34	$5.96	$5.60	$5.27	$4.95	$4.66	$4.38	**$58.7**	**$8.36**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.1.3 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

In addition, EPA considered the option of exempting both hot-mix asphalt and asphalt cement containers from the requirements of the SPCC rule. However, EPA did not select this option. EPA believes that due to the operational conditions under which asphalt cement is used and stored, asphalt cement does pose a threat to navigable waters or adjoining shorelines. Although asphalt cement is semi-solid or solid at ambient temperature and pressure, it is generally stored at elevated temperatures. Hot asphalt cement is liquid—similar to other semi-solid oils, such as paraffin wax and heavy bunker fuels—and is therefore capable of flowing. All of these oils are regulated under the SPCC rule to prevent discharges to navigable waters or adjoining shorelines.

EPA believes that the threat asphalt cement poses to navigable waters or adjoining shorelines can be effectively addressed by implementing the procedures and measures required under the SPCC regulation. The current SPCC regulation provides flexibility to asphalt facility owners and operators to account for site- and product-specific characteristics in implementing measures to prevent oil discharges in a cost-effective manner. Although the cost savings from exempting asphalt cement containers would be significant to asphalt facilities, it may not justify the potential threat. Therefore, the Agency chose not to select this option.

6.1.4 Universe of Affected Facilities

Facilities within two NAICS industry sectors are expected to store asphalt cement (see Exhibit 6-1).[74] Facilities in the "Asphalt Paving Mixture and Block Manufacturing" and "Asphalt Shingle and Coating Materials Manufacturing" sectors store asphalt cement. EPA estimated a universe of approximately 3,590 active asphalt plants that store asphalt cement in the United States, based on data obtained from the Emission Factor Documentation for asphalt plants.[75] Facilities in the "Asphalt Paving Mixture and Block Manufacturing" sector represent the largest fraction of all asphalt facilities (93 percent). As described in Section 0, the projected average annual number of new asphalt cement facilities is 69 and the number of existing asphalt cement facilities is 3,800. Exhibit 6-12 presents the projected number of new and existing asphalt facilities from 2010 through 2019. Exhibit 6-2 presents the distribution of asphalt facilities by size category.

It is important to note that even though the final amendment exempts asphalt cement containers from the SPCC requirements, facilities would still be subject to SPCC requirements if they store other types of oil. To estimate the effect of the alternative option on asphalt facilities, the Agency took the following steps:

[74] Since hot-mix asphalt is a mixture of asphalt cement and aggregate material (e.g., stone, sand or gravel), the same set of industries that handle HMA is expected to handle asphalt cement.

[75] RTI International, February 2004, "Hot-mix Asphalt Plants," Section 11.1, Emission Factor Documentation for AP-42, Final Report.

- Analyzed three SPCC Plans obtained from EPA regions and data presented in air permits and on asphalt equipment sales Web pages to estimate a fraction of the total oil storage capacity at a facility that accounts for asphalt cement storage.[76] At both temporary and stationary plants, asphalt cement accounted for approximately 85 percent of total storage, on average.[77] The Agency assumed that this estimate is applicable to asphalt cement facilities of all sizes.

- Assessed the facility's potential movement across size categories based on reduced storage capacities caused by exempt asphalt cement containers.[78] As a result, EPA estimated that 66 percent of Category I facilities would drop out of the SPCC universe, 100 percent of Category II facilities would move one size category down and become Category I, 66 percent of Category III facilities would move one size category down and become Category II, and 100 percent of Category IV facilities would move one size category down and become Category III.

Exhibit 6-11 presents the estimated fraction of asphalt cement facilities that would move across size categories as a result of the alternative option.

Exhibit 6-11
Percentage of Asphalt Cement Facilities Expected to Move Across Size Categories

Size Category	Percentage of Facilities Exempt from SPCC	Percentage of Facilities that Move Down One Size Category
Category I	66%	-
Category II	-	100%
Category III	-	66%
Category IV	-	100%

Exhibit 6-12 presents the projected number of new and existing facilities that would be affected by this alternative option over the analysis period.

[76] Vulcan Asphalt, January 2005, SPCC Plan, Cordova, AL; Narragansett Improvement Company, May 2005, SPCC Plan, Providence, RI; Floyd Crim & Sons, SPCC Plan, Asphalt plant, Manilla, IN.

[77] Under the alternative option of exempting asphalt cement, EPA also exempts HMA. Thus, the estimated fraction accounts for storage of both asphalt cement and HMA.

[78] EPA considered a flat distribution of SPCC-regulated HMA facilities within each size category (e.g., in Category II, there would be the same number of HMA facilities with total storage of 10,000, 26,000, and 42,000 gallons).

Exhibit 6-12
Projected Number of New and Existing Facilities Affected by the Alternative Option of Exempting Asphalt Cement Containers

Category	Number of Affected Facilities										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing[1]	3,700	3,720	3,740	3,770	3,790	3,810	3,830	3,860	3,880	3,900	3,800
Category I	678	682	686	690	695	699	703	707	711	715	697
Category II	1,910	1,920	1,930	1,950	1,960	1,970	1,980	1,990	2,000	2,020	1,960
Category III	863	868	874	879	884	889	895	900	905	911	887
Category IV	247	248	250	251	253	254	256	257	259	260	253
New[2]	67	67	68	68	69	69	69	70	70	71	69
Category I	12	12	12	13	13	13	13	13	13	13	13
Category II	35	35	35	35	35	36	36	36	36	37	36
Category III	16	16	16	16	16	16	16	16	16	17	16
Category IV	4	4	5	5	5	5	5	5	5	5	5

[1] The numbers are not rounded to three significant figures to show the variation of the estimates over the analysis period.
[2] The number of new affected facilities does not vary significantly across years.

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6.1.5 Estimated Cost Savings

EPA assumed that cost savings from the alternative option to exempt asphalt cement containers from SPCC requirements would consist of the following:

- Cost savings for facilities moving down a capacity category, which would imply lower cost of compliance, and for facilities that would be no longer subject to SPCC requirements, which would imply no cost of compliance (see Facility-level Cost in Exhibit 6-6).
- Cost savings for facilities that would not move down a size category but incur lower costs from not having the asphalt cement containers to comply with SPCC requirements (see Cost Savings from Exempt Containers in Exhibit 6-6).

The estimates for facility-level cost savings (see Exhibit 6-6) are based on specific assumptions developed from a review of five SPCC Plans, such as the number of tanks per facility by size category, the total capacity, and other facility characteristics, such as the type of secondary containment used (see Exhibit 6-8). The cost savings estimates from exempt containers are based on the assumption of a reduced capacity by 85 percent due to removal of asphalt cement tanks. EPA recognizes that there is wide variability in the characteristics of facilities across the United States.

EPA calculated the total compliance cost savings for asphalt facilities from the alternative option using the projected number of new and existing asphalt facilities that would be affected by the final amendment and their corresponding per-facility cost savings estimates, which are summarized in the equation below (see Appendix K in Volume II for more details on the calculation):

EPA estimated that the alternative option to exempt asphalt cement containers would reduce compliance costs by $17.9 million and $17.9 million per year, discounted at 3 percent and 7 percent, respectively.[79] Exhibit 6-13 presents the total annual cost savings for asphalt facilities each year. However, EPA did not select this option.

[79] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

Exhibit 6-13
Projected Annual Compliance Cost Savings from the Alternative Option of Exempting Hot-mix Asphalt and Asphalt Cement Containers (2007$ Millions)[1]

	Compliance Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized[2]**
Not Discounted	$17.4	$17.5	$17.7	$17.8	$17.9	$18.0	$18.1	$18.2	$18.3	$18.4	**$179**	**$17.9**
3% Discounted	$16.9	$16.5	$16.2	$15.8	$15.4	$15.0	$14.7	$14.4	$14.0	$13.7	**$153**	**$17.9**
7% Discounted	$16.3	$15.3	$14.4	$13.5	$12.7	$12.0	$11.3	$10.6	$9.95	$9.35	**$125**	**$17.9**

1 See Appendix K in Volume II for more details on the calculation of cost savings.
2 Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

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6.2 Farms

The agricultural sector is unique among SPCC-regulated sectors because farm facilities typically store relatively small quantities of oil (approximately 95 percent of the regulated facilities have 10,000 gallons or less of oil storage capacity), are geographically spread out, are end users of oil as opposed to selling or distributing oil, and often include a private residence in addition to commercial operations. In consideration of these differences and the concerns raised by the agricultural community, EPA is amending the SPCC rule to further differentiate certain requirements that apply to farms:

- Exempt pesticide application equipment and related mix containers from SPCC applicability
- Clarify in the rule preamble that the SPCC definition of mobile refuelers includes fuel nurse tanks used on farms.

These amendments are in addition to other amendments EPA is making through this action, which, although they address a broader set of SPCC-regulated facilities, have a particularly significant impact on farms. These other amendments include the following: exempting residential heating oil tanks; providing additional compliance options for certain qualified facilities that have no containers with capacities greater than 5,000 gallons; exemption from loading/unloading rack requirements; providing additional flexibility for complying with security requirements; providing additional flexibility for integrity testing requirements; reducing the requirements for the facility diagram; and additional clarifications to the rule (e.g. the definition of facility).

This section outlines the estimated impacts of the final amendments on the agricultural sector.

6.2.1 Background

One of the major concerns of the agriculture industry is that farming operations do not fit the SPCC regulatory definition of a “facility” and are unique in terms of their geographical scale, configuration, land ownership structure, and types of activities performed. Industry representatives have noted that farm configurations vary significantly across the country, or from facility to facility, and that a single farm may be composed of multiple non-contiguous parcels that are separated by roads or other physical features. Given these singularities, the agricultural industry has questioned the concept of a “facility” as it applies to farm operations. While in other sectors oil storage may be concentrated within a discrete area of a facility, a survey of farmers conducted by the U.S. Department of Agriculture (USDA) showed that nearly half of the survey respondents had multiple fuel storage on their farms—an average of six sites per farm.[80] For farms with more than one fuel storage site, the average distance of satellite sites was 4.1 miles from the main farm site. Furthermore, since farm facilities often have relatively small quantities of oil overall, each satellite storage site may only have a few small tanks.

[80] U.S. Department of Agriculture, March 2005, “Fuel/Oil Storage and Delivery for Farmers and Cooperatives,” Survey.

Farms are also unique in that they are not only a place of business, but also often include the personal residence of the farm owner or operator. This raises questions whether these home heating oil tanks should be counted as part of the farm facility, even though EPA generally did not intend to regulate residential uses of oil. Additionally, because many farmers reside on site, the facility may be manned full-time. Other SPCC-regulated facilities with similar oil storage capacity are often only attended during regular business hours.

Finally, farmers may rent certain land parcels to other operators even while they cultivate other parcels. The cultivation pattern, operator, and location of oil storage tanks may vary between seasons. The changing relationship between the owner, the operator, and the land complicates determining who has responsibility for preparing and implementing an SPCC Plan at a given site.

6.2.2 Universe of Affected Facilities

In the regulatory impact analysis of the 2006 rule amendments,[81] EPA estimated that 152,000 farms are subject to the SPCC rule. EPA further estimated that approximately 95 percent of these farms have between 1,320 and 10,000 gallons of oil. To develop these estimates, EPA used publicly available data that cover the entire universe of farms. While the data are comprehensive, they are not detailed to the level of individual farms. EPA therefore had to make assumptions about the quantity of fuel corresponding to fuel expenditures, and the fraction of the fuel purchased that is stored prior to use.

6.2.3 Baseline Compliance Cost and Cost Savings

The estimated compliance cost savings for the farm sector from the rule amendments are discussed separately for each of the final amendments separately in the subsections below.

6.2.3.1 Pesticide Application Equipment and Related Mix Containers Exemption

EPA is exempting from the SPCC rule all pesticide application equipment and related mix containers. This equipment is used to mix, store, and apply pesticides whose formulation may include petroleum- or vegetable-based oils, and which could therefore otherwise be subject to SPCC requirements. This exemption applies to all pesticide application equipment and certain related mix containers, regardless of ownership or where used, because the application of pesticides through the use of this equipment is the same at any location. Under this amendment, containers (55 gallons or greater in capacity) storing oil prior to blending it with the pesticide or used to store any pesticides after they have been mixed with oil, are considered bulk storage containers and continue to be regulated as such under the SPCC rule.

This amendment would potentially benefit farms and other facilities that use pesticide formulations where adjuvant oil or crop oil is added to the mix formulation and have pesticide application equipment with a storage capacity of 55 gallons or greater, by reducing the compliance costs that would otherwise be associated with this equipment.

[81] U.S. EPA, November 2006, "Regulatory Impact Analysis for the Final Revisions to the Oil Pollution Prevention Regulations (40 CFR Part 112)."

EPA could not obtain detailed data on the number of farms and facilities of other industries where such equipment is used and the capacity of this equipment. However, some reports provided information on the possible use of this equipment on farms in the United States. The Virginia Cooperative Extension conducted an economic analysis of pesticide application equipment which concludes that for farms less than 500 acres, the per-acre cost of using a custom applicator is lower than purchasing pesticide application equipment.[82] This suggests that farms smaller than 400 acres would not have pesticide application equipment on site. Further, the report concludes that 300-gallon capacity on pesticide application equipment would be the cost-minimizing choice for farms of 500-1,000 acres. Another report has similar analysis for 2,000 and 3,000-acre farms and concludes that 750 gallon capacity container on pesticide application equipment would be cost minimizing for a 2,000 acre farm, and 1,200 gallon capacity equipment would be cost minimizing for a 3,000 acre farm.[83]

These studies are based on regional data, and their findings may not necessarily apply to all farms in the United States, especially because the cost effectiveness of purchasing this equipment would depend on the number of plantings, which is likely to vary by crop and region. However, these are the only available data that EPA had to estimate the possible capacity of pesticide application equipment at farms in the United States. In the absence of data that are representative of the United States, EPA relied on these studies and estimated that the average capacity of pesticide application equipment is 400 gallons at farms between 500 and 1,000 acres, 625 gallons at farms between 1,000 and 2,000 acres and 1,200 gallons at farms greater than 2,000 acres. These estimates are based on a simplifying assumption that all farms mix oil with pesticide.

Since the data on the average capacity of pesticide application equipment were based on farm size, the next step involved estimating the distribution of farm size by oil storage capacity. EPA used data from the Census of Agriculture to obtain the farm size distribution by farm production expenses on oil. Using these data, EPA estimates that 23 percent of farms in Category I are between 500 and 1,000 acres, 22 percent are between 1,000 and 2,000 acres, and 18 percent are greater than 2,000 acres. For farms in Categories II, III, and IV, 11 percent of farms are between 200 and 1,000 acres, 19 percent of farms are between 1,000 and 2,000 acres, and 45 percent of farms are greater than 2,000 acres. This implies that 64 percent of farms in Category I and 75 percent of farms in Category II, III, and IV have pesticide application equipment and would be affected by the final amendment to exempt this equipment. Exhibit 6-14 presents the projected number of new and existing farms affected by this amendment over the analysis period.

[82] Virginia Cooperative Extension, 2001, "Economic Analysis of Pesticide Application Equipment," Farm Business Management Update. Available at: http://www.ext.vt.edu/news/periodicals/fmu/2001-10/economicanalysis.html.

[83] Lessiter, Mike, 2007, "Purchasing a Sprayer - Demystifying the Payback," Farm Equipment. Available at: http://www.lesspub.com/cgi-bin/site.pl?332&ceNews_newsID=2750.

Exhibit 6-14
Projected Total Number of New and Existing Farms Affected by the Preferred Option of Exempting Pesticide Application Equipment

Category	Number of Farms Affected by the Preferred Option										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing Farms	95,600	95,200	94,700	94,300	93,900	93,500	93,100	92,700	92,300	91,800	**93,700**
Category I	89,900	89,500	89,100	88,700	88,300	87,900	87,500	87,100	86,800	86,400	**88,100**
Category II	5,190	5,170	5,140	5,120	5,100	5,080	5,050	5,030	5,010	4,990	**5,090**
Category III & IV	502	500	498	496	493	491	490	487	483	482	**492**
New Farms	850	847	843	839	835	832	828	824	821	817	**834**
Category I	799	796	793	789	786	782	779	775	772	768	**784**
Category II	46	46	46	46	45	45	45	45	45	44	**45**
Category III & IV	4	4	4	4	4	4	4	4	4	4	**4**

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Cost savings to farms from exempting pesticide application equipment would be from not having to comply with the SPCC requirements for this equipment. Therefore, the cost savings would be equal to the baseline cost of compliance with this requirement. Since the pesticide application equipment is portable, there would be no savings from secondary containment requirement, but farms would save from not having to perform periodic integrity testing of the equipment. Exhibit 6-15 presents the cost savings to farms by size category. Since the average size of a pesticide application ranges between 400 gallons and 1,200 gallons, EPA estimates that the integrity testing cost for these equipment units would be the same.

Exhibit 6-15
Annual Farm-level Baseline Cost of Compliance and Cost Impact of Exempting Pesticide Application Equipment (2007$)[1]

Size Category	Farm-level Cost (New and Existing)
	Annual Integrity Testing Cost[2]
Category I	$42
Category II	$42
Category III	$42

1 The cost savings would be equal to the baseline cost of compliance with the pesticide application equipment requirement.
2 Based on integrity testing cost of $500 per tank every 12 years.

The total cost savings (and the baseline cost of compliance) from the final amendments were calculated by multiplying the farm-level cost with the total number of farms affected by this amendment as summarized in the equation below.

Using the equation below, EPA estimated that the final amendment would reduce compliance costs by $3.56 million and $3.57 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-16). Since this amendment would exempt all pesticide application equipment and related mix containers, regardless of ownership or type of facility on which the equipment and containers are used, facilities from other industry categories (in addition to farms) may also incur cost savings. It is important to note that EPA did not have adequate data to quantify these savings. Therefore, this estimate represents a lower bound of the potential savings from the final amendment.

Calculation of Total Cost Savings

$$\text{Net Cost Savings} = \sum_{j=1}^{2}\sum_{i=I}^{IV} NFac_{ij} * NCostSaving_{ij} * Overlap_i$$

Where i = I, II, III, and IV represents the size category, and j = 1,2 represents the new or existing farms.

$NFac_{ij}$ = the projected number of affected farms in size category i of type j (see Exhibit 6-15).

$NCostSaving_{ij}$ = per-farm cost savings for size category i of type j. (see Exhibit 6-15).

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22).

Exhibit 6-16
Projected Annual Compliance Cost Savings from Exempting Pesticide Application Equipment (2007$ Millions)[1]

	Compliance Cost Savings [2]											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$3.63	$3.61	$3.60	$3.58	$3.57	$3.55	$3.54	$3.52	$3.50	$3.49	**$35.6**	**$3.56**
3% Discounted	$3.52	$3.41	$3.29	$3.18	$3.08	$2.97	$2.87	$2.78	$2.69	$2.60	**$30.4**	**$3.56**
7% Discounted	$3.39	$3.16	$2.94	$2.73	$2.54	$2.37	$2.20	$2.05	$1.91	$1.77	**$25.1**	**$3.57**

1 The baseline cost of compliance is the same as the compliance cost savings.
2 See Appendix K in Volume II for more details on the calculation of cost savings.

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6.2.3.2 Clarification of the Definition of Mobile Refuelers

In the October 2007 proposed rule, EPA clarified that the definition of mobile refueler, as promulgated in the December 2006 amendments to the SPCC rule (71 FR 77266, December 26, 2006), includes a nurse tank, which is a mobile/portable container used at farms to store and transport fuel for transfers to or from farm equipment (such as tractors and combines) to other bulk storage containers (such as containers used to provide fuel to wellhead/relift pumps) at the farm. A nurse tank is often mounted on a trailer for transport around the farm; thus, EPA believes that this function is consistent with that of a mobile refueler. A nurse tank, like other types of mobile refuelers, is exempt from the sized secondary containment requirements at §§112.8(c)(2) and 112.12(c)(2), but is still subject to the general secondary containment requirements at §112.7(c).

Because this is strictly a clarification regarding existing provisions for this class of equipment, and does not change the regulatory requirements, the amendment is not anticipated to have an economic impact on regulated farms. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

6.2.3.3 Aggregate Cost Savings for Farms

In addition to the farm-specific amendments discussed above, EPA is also making other amendments to the SPCC rule that, although they apply to the SPCC-regulated universe as a whole, would represent significant cost savings for the farm sector in particular. Farms will benefit from the new requirements for Tier I qualified facilities, amendments to the security, integrity testing, and facility diagram requirements; amendments to the definition of "loading/unloading rack"; and the exemption for single-family residential heating oil containers, in addition to the exemption of pesticide application equipment. The total annualized cost savings to farm owners and operators from these amendments in aggregate are estimated at $13.3 million and $13.3 million at the 3 percent and 7 percent discount rate, respectively. [84] The aggregated cost savings for farms are presented in Exhibit 6-17.

[84] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

Exhibit 6-17
Estimated Aggregate Annual Cost Savings for Farms from Multiple Rule Components (2007$ Millions)

Option	%	Total Cost Savings for Farms											
		Year											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	10- Year Present Value	Annualized
		1	2	3	4	5	6	7	8	9	10		
Tier I Qualified Facilities													
	0%	$4.57	$4.55	$4.53	$4.51	$4.49	$4.47	$4.45	$4.43	$4.41	$4.39	**$44.8**	**$4.48**
	3%	$4.44	$4.29	$4.15	$4.01	$3.88	$3.75	$3.62	$3.50	$3.38	$3.27	**$38.3**	**$4.49**
	7%	$4.27	$3.98	$3.70	$3.44	$3.20	$2.98	$2.77	$2.58	$2.40	$2.23	**$31.6**	**$4.49**
Security													
High Estimate (100% of Facilities Affected)													
	0%	$1.51	$1.50	$1.50	$1.49	$1.48	$1.48	$1.47	$1.46	$1.46	$1.45	**$14.8**	**$1.48**
	3%	$1.46	$1.42	$1.37	$1.32	$1.28	$1.24	$1.20	$1.16	$1.12	$1.08	**$12.6**	**$1.48**
	7%	$1.41	$1.31	$1.22	$1.14	$1.06	$0.98	$0.92	$0.85	$0.79	$0.74	**$10.4**	**$1.48**
Midpoint Estimate (75% of Facilities Affected)													
	0%	$1.13	$1.13	$1.12	$1.12	$1.11	$1.11	$1.10	$1.10	$1.09	$1.09	**$11.1**	**$1.11**
	3%	$1.10	$1.06	$1.03	$0.992	$0.959	$0.927	$0.896	$0.866	$0.837	$0.810	**$9.48**	**$1.11**
	7%	$1.06	$0.985	$0.916	$0.852	$0.793	$0.737	$0.687	$0.639	$0.594	$0.553	**$7.81**	**$1.11**
Low Estimate (50% of Facilities Affected)													
	0%	$0.754	$0.752	$0.748	$0.745	$0.741	$0.738	$0.735	$0.732	$0.728	$0.725	**$7.40**	**$0.740**
	3%	$0.732	$0.708	$0.685	$0.662	$0.639	$0.618	$0.598	$0.578	$0.558	$0.540	**$6.32**	**$0.741**
	7%	$0.705	$0.656	$0.611	$0.568	$0.529	$0.492	$0.458	$0.426	$0.396	$0.369	**$5.21**	**$0.742**
Integrity Testing													
	0%	$1.47	$1.47	$1.46	$1.45	$1.45	$1.44	$1.44	$1.43	$1.42	$1.42	**$14.4**	**$1.44**
	3%	$1.43	$1.38	$1.34	$1.29	$1.25	$1.21	$1.17	$1.13	$1.09	$1.05	**$12.3**	**$1.45**
	7%	$1.38	$1.28	$1.19	$1.11	$1.03	$0.96	$0.89	$0.83	$0.77	$0.72	**$10.2**	**$1.45**
Facility Diagram													
	0%	$0.182	$0.181	$0.180	$0.179	$0.178	$0.178	$0.177	$0.176	$0.175	$0.175	**$1.78**	**$0.178**
	3%	$0.176	$0.171	$0.165	$0.159	$0.154	$0.149	$0.144	$0.139	$0.134	$0.130	**$1.52**	**$0.178**
	7%	$0.170	$0.158	$0.147	$0.137	$0.127	$0.118	$0.110	$0.103	$0.095	$0.089	**$1.25**	**$0.179**

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Exhibit 6-17
Estimated Aggregate Annual Cost Savings for Farms from Multiple Rule Components (2007$ Millions)

Option	%	Total Cost Savings for Farms											
		Year											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	10- Year Present Value	Annualized
		1	2	3	4	5	6	7	8	9	10		
Residential Oil													
	0%	$2.36	$2.35	$2.34	$2.33	$2.31	$2.30	$2.29	$2.28	$2.27	$2.26	**$23.1**	**$2.31**
	3%	$2.29	$2.21	$2.14	$2.07	$2.00	$1.93	$1.87	$1.80	$1.74	$1.68	**$19.7**	**$2.31**
	7%	$2.20	$2.05	$1.91	$1.77	$1.65	$1.54	$1.43	$1.33	$1.24	$1.15	**$16.3**	**$2.32**
Pesticide Application Equipment													
	0%	$3.63	$3.61	$3.60	$3.58	$3.57	$3.55	$3.54	$3.52	$3.50	$3.49	**$35.6**	**$3.56**
	3%	$3.53	$3.41	$3.29	$3.18	$3.08	$2.97	$2.87	$2.78	$2.69	$2.60	**$30.4**	**$3.56**
	7%	$3.39	$3.16	$2.94	$2.73	$2.54	$2.37	$2.20	$2.05	$1.91	$1.77	**$25.1**	**$3.57**
Loading Rack													
High Estimate (14% of Facilities Affected)													
	0%	$0.264	$0.263	$0.262	$0.260	$0.259	$0.258	$0.257	$0.256	$0.255	$0.254	**$2.59**	**$0.259**
	3%	$0.256	$0.248	$0.239	$0.231	$0.224	$0.216	$0.209	$0.202	$0.195	$0.189	**$2.21**	**$0.259**
	7%	$0.247	$0.229	$0.213	$0.199	$0.185	$0.172	$0.160	$0.149	$0.139	$0.129	**$1.82**	**$0.259**
Midpoint Estimate (8% of Facilities Affected)													
	0%	$0.155	$0.154	$0.153	$0.153	$0.152	$0.151	$0.150	$0.150	$0.149	$0.148	**$1.52**	**$0.152**
	3%	$0.150	$0.145	$0.140	$0.135	$0.131	$0.127	$0.122	$0.118	$0.114	$0.110	**$1.29**	**$0.152**
	7%	$0.144	$0.134	$0.125	$0.116	$0.108	$0.101	$0.094	$0.087	$0.081	$0.075	**$1.07**	**$0.152**
Low Estimate (2% of Facilities Affected)													
	0%	$0.0452	$0.0450	$0.0448	$0.0446	$0.0444	$0.0442	$0.0440	$0.0439	$0.0437	$0.0435	**$0.443**	**$0.0443**
	3%	$0.0439	$0.0424	$0.0410	$0.0397	$0.0383	$0.0371	$0.0358	$0.0346	$0.0335	$0.0323	**$0.379**	**$0.0444**
	7%	$0.0423	$0.0393	$0.0366	$0.0341	$0.0317	$0.0295	$0.0274	$0.0255	$0.0237	$0.0221	**$0.312**	**$0.0445**
Total													
	0%	**$13.5**	**$13.4**	**$13.4**	**$13.3**	**$13.3**	**$13.2**	**$13.1**	**$13.1**	**$13.0**	**$13.0**	**$132**	**$13.2**
	3%	**$13.1**	**$12.7**	**$12.2**	**$11.8**	**$11.4**	**$11.1**	**$10.7**	**$10.3**	**$10.0**	**$9.65**	**$113**	**$13.3**
	7%	**$12.6**	**$11.7**	**$10.9**	**$10.2**	**$9.46**	**$8.80**	**$8.19**	**$7.62**	**$7.09**	**$6.60**	**$93.2**	**$13.3**

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6.2.4 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

In addition, EPA considered the alternative to exempt farms that store oil below a certain oil storage capacity threshold, although the exact storage capacity was not specified. However, EPA did not select this option. Although oil storage is less at certain farms than at facilities in other SPCC-regulated sectors, some farms do have significant quantities of oil and storage tanks similar in function and design, and have the potential to discharge oil in quantities that may be harmful to navigable waters or adjoining shorelines. The cost savings from this alternative would be the total cost of compliance with the SPCC rule per farm multiplied by the total number of SPCC-regulated farms. However, EPA developed an illustrative estimate of the total cost of compliance with the SPCC rule, based on the reports of farm visits. This cost gives an indication of the potential cost savings from exempting farms. Since the estimate is based on limited trip reports, it does not capture the wide variability in farms across the United States.

6.2.5 Universe of Affected Facilities

EPA estimates that the number of farms affected by the alternative option would depend on the specific capacity threshold. Both new and existing farms would be affected, although the cost savings for new farms would be from both capital and recurring costs, while the cost savings for the existing farms would be only from the recurring costs, assuming that there is complete compliance with the 2002 SPCC rule. Exhibit 6-18 presents the projected number of new and existing farms that could be affected by this alternative option from 2010 through 2019. The projected average annual number of new farms is 1,300, and the number of existing farms is 146,000. EPA projected the number of new and existing farms over the 10-year analysis period using the estimated number of SPCC-regulated farms and farm-specific growth rates.[85]

[85] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

Exhibit 6-18
Projected Total Number of New and Existing Farms Affected by the Alternative Option of Exempting Farms below a Certain Capacity

Category	Number of Farms Affected by the Alternative Option										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing Farms	149,000	148,000	148,000	147,000	146,000	146,000	145,000	144,000	144,000	143,000	**146,000**
Category I	141,000	141,000	140,000	140,000	139,000	138,000	138,000	137,000	137,000	136,000	**139,000**
Category II	6,900	6,870	6,840	6,810	6,780	6,750	6,720	6,690	6,660	6,630	**6,770**
Category III & IV	668	665	662	659	656	653	650	648	644	642	**655**
New Farms	1,330	1,320	1,310	1,310	1,300	1,300	1,290	1,280	1,280	1,270	**1,300**
Category I	1,260	1,250	1,250	1,240	1,240	1,230	1,230	1,220	1,210	1,210	**1,230**
Category II	61	61	61	61	60	60	60	60	59	59	**60**
Category III & IV	6	6	6	6	6	6	6	6	6	6	**6**

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6.2.6 Estimated Cost Savings

As an alternative, EPA considered exempting farms that stored oil below a certain storage capacity threshold from the SPCC requirements, but determined that sufficient data to support such an exemption exclusive to farms do not currently exist. While farming operations may be unique, the storages tanks found at farms are similar in function and design as those found at other types of facilities, and therefore have a similar potential for a discharge. Thus, an effort to substantiate an exemption for a subset of affected farms below a certain threshold would be difficult. As a result, EPA chose not to propose this option. The baseline cost of compliance before the alternative option would be the cost that new and existing farms face in complying with the SPCC requirements. New farms would save on both the capital and recurring cost of compliance, while the existing farms would save on the recurring cost of compliance with the regulations (assuming that all existing farms are currently 100 percent compliant).

Cost savings for a farm that is exempt from SPCC requirements would be equal to its baseline cost of compliance and will depend on whether the farm is new or already existing. In Exhibit 6-19, the range of estimates for cost of compliance for new farms represents the different types of secondary containment: concrete (high cost estimate), earthen berm (medium cost estimate) and creative methods that do not have any cost (low cost estimate). EPA assumed that 25 percent of the farms faced the low cost, 50 percent facilities faced the medium cost, and the remaining 25 percent of the farms faced the high cost estimate. The cost of compliance does not include the cost associated with partially buried storage containers, which EPA estimates are present at approximately 10 percent of all farms. Therefore, to estimate the total impact of the final rule, EPA added the cost of compliance measures for buried storage containers to the total per-farm compliance cost for 10 percent of the farms. Further, the costs are an average of in-house labor and professional labor. The farm-level cost of compliance with the 2002 SPCC rule is based on specific assumptions on the number of tanks at farms by size category, the total capacity, and other farm characteristics based on visits to select farms. Therefore, these costs are meant to be illustrative of the cost of compliance at the farm level.

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Exhibit 6-19
Annual Cost Impact from the Final Amendment to Definition of Facility (2007$)[1]

Size Category	Farm-level Cost Savings				
	Existing[2]	New			
		Secondary Containment			Partially Buried Tank[4]
		Low[3]	Medium[3]	High[3]	
Category I	$5,850	$56,900	$59,600	$63,400	$640
Category II	$9,630	$62,500	$67,500	$92,200	$640
Category III	$37,600	$131,000	$157,000	$206,000	$2,050

1 The farm-level cost of compliance with the SPCC rule for a new facility is based on specific assumptions on the number of tanks, the total capacity and other facility characteristics. These costs are meant to be illustrative and not representative of average cost at a facility. The estimates are the average of facility-level cost using in-house labor and outside labor. The detailed assumptions are presented in Exhibit L-8, Appendix L in Volume II. The cost estimates do not include the adjustment for state overlap.

2 Cost savings for existing farms that include only recurring cost of compliance.

3 Cost savings for new farms include the capital and recurring cost of compliance. The low (creative secondary containment), medium (earthen), and high (concrete) estimates reflect the type of secondary containment at bulk storage containers. EPA assumed that 25% of farms would have creative, 25% of farms would have concrete, and 50% of farms would have earthen secondary containment.

4 EPA assumed that 10% of the new farms would have partially buried tanks.

The total cost savings from the final amendments were calculated by multiplying the farm-level cost with the total number of farms affected by this amendment, as summarized in the equation below. Since the capacity threshold is not specified, the cost savings are presented for the four size categories.

Net Cost Savings
=

$$\sum_{j=1}^{2}\sum_{i=I}^{IV} NFac_{ij} * (NCostSLow_{ij} * 0.25 + NCostSMed_{ij} * 0.5 + NCostSHigh_{ij} * 0.25 + Buried_{ij} * 0.1) * Overlap_i$$

Where

i = I,II, III, and IV represent the size category, and j = 1,2 represent the new or existing farms.

$Nfac_{ij}$ = the projected number farms in size category i of type j (see Exhibit 6-18).

$NCost\ SLow_{ij}$ = the low estimate of per-farm cost savings for size category i of type j. EPA assumed that 25 percent of farms incurred this cost (see Exhibit 6-19).

$NCost\ SMed_{ij}$ = the low estimate of per-farm cost savings for size category i of type j. EPA assumed that 50 percent of farms incurred this cost (see Exhibit 6-19).

$NCost\ SHigh_{ij}$ = the low estimate of per farm cost savings for size category i of type j. EPA assumed that 25 percent of farms incurred this cost (see Exhibit 6-19).

$Buried_i$ = cost of partially buried tanks. EPA assumed that 10 percent of facilities have these tanks (see Exhibit 6-19).

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22).

EPA estimated that if farms below 10,000 gallons storage capacity (Category I) were exempt, it would reduce the compliance cost by $801 million and $802 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-20). However, EPA did not select this option.

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Exhibit 6-20
Projected Annual Compliance Cost Savings from the Alternative Option of Exempting Farms below a Certain Capacity, by Size Category (2007$ Millions)[1]

	Cost Savings[2]											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Category I												
Not Discounted	$817	$813	$809	$806	$802	$799	$795	$792	$788	$785	**$8,010**	**$801**
3% Discounted	$793	$766	$741	$716	$692	$669	$647	$625	$604	$584	**$6,840**	**$801**
7% Discounted	$763	$710	$661	$615	$572	$532	$495	$461	$429	$399	**$5,640**	**$802**
Category II												
Not Discounted	$64.1	$63.9	$63.6	$63.3	$63.0	$62.7	$62.5	$62.2	$61.9	$61.6	**$629**	**$62.9**
3% Discounted	$62.3	$60.2	$58.2	$56.2	$54.4	$52.5	$50.8	$49.1	$47.4	$45.9	**$537**	**$62.9**
7% Discounted	$59.9	$55.8	$51.9	$48.3	$44.9	$41.8	$38.9	$36.2	$33.7	$31.3	**$443**	**$63.0**
Category III & IV												
Not Discounted	$19.8	$19.7	$19.6	$19.5	$19.4	$19.3	$19.3	$19.2	$19.1	$19.0	**$194**	**$19.4**
3% Discounted	$19.2	$18.6	$17.9	$17.3	$16.8	$16.2	$15.7	$15.1	$14.6	$14.1	**$166**	**$19.4**
7% Discounted	$18.5	$17.2	$16.0	$14.9	$13.9	$12.9	$12.0	$11.2	$10.4	$9.66	**$136**	**$19.4**

1 The baseline cost of compliance is the same as the compliance cost savings.
2 See Appendix K in Volume II for more details on the calculation of cost savings.

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6.3 Residential Heating Oil

Many regulated facilities, including farms, may include the residence of the owner or operator within the geographical confines of the facility. EPA did not intend to regulate residential uses of oil (that is, those at non-commercial buildings) under the SPCC rule. Therefore, EPA is exempting residential heating oil containers at single family residences from the SPCC requirements. EPA is also modifying §112.1(d)(2) so that the capacity of single-family residential heating oil containers is not counted toward facility oil storage capacity.

The final rule removes from SPCC applicability containers (both aboveground and completely buried) located at a single-family residence that are used solely to store heating oil used to heat the residence. Under the final amendments, the owner or operator is not required to count any residential heating oil container as part of the facility's aggregate storage capacity for purpose of determining SPCC applicability, and no SPCC requirements would apply to the exempted containers. The SPCC requirements would continue to apply, however, to bulk storage containers for oil used to heat other non-residential buildings within a facility, because the exemption covers only residential heating oil containers.

6.3.1 Universe of Affected Facilities

All regulated facilities where the residences are co-located with businesses would be affected by this change.[86] Therefore, the industries that are likely to be affected by this change include farms, universities, and military bases. EPA did not have adequate data to determine the extent of residential oil storage at universities, and military bases, but had relatively comprehensive information for farms. EPA estimates that potentially all new and existing farms that store residential heating oil would be affected by this amendment. Further, the Agency expects that only family farms would have residences on the farms and calculated the percentage of family farms that are SPCC regulated. To estimate the number of farms affected by this amendment the Agency took the following steps:

- Estimated the total number of SPCC-regulated family farms using the 2005 Family Farm Report, which indicates that approximately 90 percent of the SPCC-regulated farms are family farms.[87]
- Estimated the percentage of SPCC-regulated family farms that use heating oil for heating purposes. To estimate this percentage, the Agency obtained data from DOE on the percentage of households that use heating oil used relative to propane by four regions in the United States: Northeast, Midwest, West, and South.[88] The data suggests that 80 percent of households in the Northeast, 28 percent in the Midwest, 19 percent in the West, and 12 percent in the South use residential oil. EPA applied the same percentage to SPCC-regulated farms in the four regions to estimate the

[86] Private residences themselves are not regulated by SPCC unless they are on business property.

[87] USDA, 2005, Table 3, "Farm Size and Tenure by Farm Size, 2003" in the 2005 Family Farm Report. EPA assumed that only the medium to very large family farms are SPCC regulated.

[88] DOE, 2001, Residential Energy Consumption Survey.

total number of SPCC-regulated farms that would be affected by this final amendment.

Exhibit 6-21 presents the projected number of new and existing farms that could be affected by this final amendment from 2010 through 2019. The projected average annual number of new farms is 328, and the number of existing farms is 36,900. EPA projected the number of new and existing farms over the 10-year analysis period using the estimated number of SPCC-regulated farms and farm-specific growth rates.[89]

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[89] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

Exhibit 6-21
Projected Total Number of New and Existing Farms Affected by the Residential Oil Exemption

Number of Farms Affected by the Preferred Option	Number of Farms Affected by the Preferred Option										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing Farms	37,600	37,500	37,300	37,100	37,000	36,800	36,600	36,500	36,300	36,200	**36,900**
Category I	35,900	35,700	35,600	35,400	35,300	35,100	34,900	34,800	34,600	34,500	**35,200**
Category II	1,590	1,580	1,570	1,560	1,560	1,550	1,540	1,540	1,530	1,520	**1,550**
Category III & IV	154	153	152	151	151	150	150	149	148	148	**150**
New Farms	335	333	332	330	329	327	326	324	323	322	**328**
Category I	319	318	316	315	314	312	311	309	308	307	**313**
Category II	14	14	14	14	14	14	14	14	14	14	**14**
Category III & IV	1	1	1	1	1	1	1	1	1	1	**1**

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6.3.2 Baseline Compliance Cost and Cost Savings

EPA is specifically exempting from SPCC applicability containers that are used to store oil for the sole purpose of heating a single-family residence (including a residence at a farm). Therefore the cost savings to farms would be the baseline cost of compliance with this requirement. Existing farms would save on the annual expenditure for meeting SPCC requirements for regulated tanks. New farms would save on the fixed costs that include the cost of secondary containment and installing liquid sensing device on the container. These cost savings depend on the capacity of the tank. To estimate the total capacity of a residential heating oil tank by size category, the Agency took the following steps:

- Estimated the average capacity of a residential heating oil tank. EPA relied on estimates from DOE that indicate that a typical residence either has a 275-gallon tank or a 550-gallon tank.[90] Further, EPA made a simplifying assumption that residences in Categories I and II have one 275-gallon tank each, and residences in Categories III and IV have a 550-gallon tank.
- Estimated the average number of residences by size category and calculated the average capacity of residential oil tanks by size category. EPA relied on the 2005 Family Farm Report and estimated that farms in Category I have 1.5 residences, farms in Category II have 1.6, farms in Category III have 1.7, and farms in Category IV have 1.9. Thus, given the assumption on the capacity of each heating oil tank, EPA estimates that the average capacity of residential oil tanks at farms in Categories I, II, and III is 413 gallons, 440 gallons, and 935 gallons, respectively.
- Estimated the average cost savings by size category given the average capacity of farms in each category.

Exhibit 6-22 provides the farm-specific cost savings for new and existing farms from the final amendments. EPA estimates that farms in Category I and Category II would save approximately $3,100, and farms in Category III would save approximately $3,760 annually from the final amendments.

[90] U.S. Department of Energy (DOE), Office of Economic, Electricity, and Natural Gas Analysis, Office of Policy. 2000. "The Role of Interruptible Natural Gas Customers in New England Heating Oil Markets: A Preliminary Examination of Events in January-February 2000." November 2000, Document Number DOE/PO-0063.

Exhibit 6-22
Annual Baseline Compliance Cost and Cost Savings to Farms from the Final Amendment to Exempt Residential Oil (2007$)[1]

Size Category	Residential Oil Tanks Capacity (gallons)[2]	Farm-level Cost				
		Existing	New			
		Integrity Testing[3]	Secondary Containment[4]	Liquid Sensing Device[5]	Integrity Testing[3]	Total
Category I	413	$42	$661	$2,400	$42	$3,100
Category II	440	$42	$661	$2,400	$42	$3,100
Category III, IV	935	$42	$1,320	$2,400	$42	$3,760

1 Rounded to three significant digits.
2 Assumes that farms in Categories I and II have 275-gallon tanks and farms in Category III have 550-gallon tanks, and the average number of residences is 1.5, 1.6, 1.7, and 1.9 for the four size categories, respectively.
3 Based on integrity testing cost of $500 per tank every 12 years.
4 The PE firm estimates the secondary containment cost for a 1,000-gallon tank to be $1,320. EPA assumed that the cost would be half for Categories I and II, which have less than half the capacity of a 1,000-gallon tank.
5 Cost for spill cover and drain kit.

It is important to note that since certain SPCC requirements may be similar in nature to those imposed by state regulations and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. Since regulations vary widely across states and industries, there is no single adjustment factor that could be developed to address this issue for the universe of regulated facilities. However, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. As a result, the estimated compliance costs are likely to present an overestimate of the costs attributed to the SPCC rule. For details of the state overlap analysis, refer to Section 5.4 of this report.

The total cost savings from the final amendments (and the baseline cost of compliance) were calculated by multiplying the farm-level cost with the total number of farms affected by this amendment, as summarized in the equation below.

Using the equation below, EPA estimated that the final amendment would reduce compliance costs by $2.31 million and $2.32 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-23). It is important to note that facilities from other industry categories may also incur cost savings but EPA did not have adequate data to quantify these savings. Therefore, this estimate represents a lower bound of the potential savings from the final amendment.

Calculation of Total Cost Savings

$$\text{Net Cost Savings} = \sum_{j=1}^{2}\sum_{i=I}^{IV} NFac_{ij} * NCostSaving_{ij} * Overlap_i$$

Where i = I, II, III and IV represent the size category and j = 1, 2 represent the new or existing farms.

$NFac_{ij}$ = the projected number of affected farms in size category i of type j (see Exhibit 6-21).

$NCostSaving_{ij}$ = per farm cost savings for size category i of type j. (see Exhibit 6-22).

$Overlap_i$ = 1- estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22).

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Exhibit 6-23
Projected Annual Compliance Cost Savings from the Final Amendment to Exempt Residential Heating Oil (2007$ Millions)[1]

	Compliance Cost Savings[2]											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$2.36	$2.35	$2.34	$2.32	$2.31	$2.30	$2.29	$2.28	$2.27	$2.26	**$23.1**	**$2.31**
3% Discounted	$2.29	$2.21	$2.14	$2.07	$2.00	$1.93	$1.87	$1.80	$1.74	$1.68	**$19.7**	**$2.31**
7% Discounted	$2.20	$2.05	$1.91	$1.77	$1.65	$1.54	$1.43	$1.33	$1.24	$1.15	**$16.3**	**$2.32**

1 Baseline compliance cost is the same as the cost savings.
2 See Appendix K in Volume II for more details on the calculation of cost savings.

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6.3.3 Alternative Options Considered

EPA initially considered providing an exemption only for residential heating oil containers located at farms, because farms commonly include, within the geographical confines of the facility, the residence of the farmer. Under this option, only heating oil containers associated with residences on farms would benefit from an exemption from the SPCC rule. However, EPA understands that a facility associated with another industry sector, such as a military base or university, or a small business run out of the owner's home, may also contain a residential heating oil container. The Agency determined that there was no rationale to support not expanding the exemption to all residential heating oil containers. Therefore, the Agency chose not to select this option.

Since EPA did not have adequate data to determine the extent of residential oil storage at facilities of other types such as universities, and military bases, and only estimated cost savings for farms, an estimated cost impact for the alternative option could be considered based on the information presented in the section for the preferred option.

6.4 Definition of "Facility"

6.4.1 Background

EPA is amending the definition of facility in three ways: (1) to clarify that this definition alone governs the applicability of 40 CFR part 112; (2) to clarify that containers can be separated or aggregated, based on various factors in defining "facility"—that is, the owner or operator has discretion in identifying which contiguous or non-contiguous buildings, properties, parcels, leases, structures, installations, pipes, or pipelines make up the facility; and (3) to add the qualifier "oil" before the term "waste treatment." EPA had defined both "facility" and "production facility" in 2002 and is clarifying that even for production facilities the definition of "facility" would govern the meaning of a facility for determining applicability of the SPCC. EPA is also amending the definition of facility to clarify that non-contiguous parcels may be considered separate facilities because the regulated community (especially farms, military bases, airports, and large universities) has raised concerns over how to aggregate buildings, structures, installations, equipment, piping, and other containers for the purpose of SPCC applicability. Since these changes only seek to provide clarification and do not change the existing regulatory requirements, they are not expected to result in any change in facility compliance costs. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

It is important to note that the baseline estimate for the number of SPCC-regulated facilities does not take into account a possible change in behavior of facility owners and operators with respect to redefining their facility boundaries when the facility is located on multiple non-contiguous parcels. EPA recognizes that the baseline estimate for the number of SPCC-regulated facilities and the baseline compliance cost are likely to represent an overestimate. The Agency potentially overestimates the regulated universe because facility owners and operators might have redefined their boundaries and divided the parcels in order to reduce

regulatory burden. This behavioral change would reduce the number of regulated facilities, leaving a certain number of facilities outside of the SPCC universe. Facilities in the following industries are expected to be most affected by this rule flexibility: farms, large oil production facilities, military bases, airports, and large universities.

6.5 Facility Diagram

EPA is amending the SPCC rule to provide additional flexibility to the requirement that the facility diagram include the location and contents of each container. EPA is also requiring that certain containers and piping, exempted from SPCC requirements in this action, be identified on the facility diagram and marked "as exempt." This includes intra-facility gathering lines subject to the requirements of 49 CFR part 192 or 195 as described in §112.1(d)(11); and any produced water container, as defined in §112.2, that meets the requirements at §112.9(c)(6)(i) as described in §112.1(d)(12). Under the final amendments, a facility owner or operator only has to mark the area on the diagram where mobile or portable containers are stored. The owner or operator can indicate the average number of containers and the anticipated contents and capacities of the mobile or portable containers maintained at the facility in the Plan if the total number of mobile or portable containers changes on a frequent basis.

This revision to the rule language would simplify the process for developing a facility diagram by allowing for a general description of the location and contents of numerous mobile or portable oil storage containers (e.g., drums and totes) rather than representing each container individually on the diagram. The amendment provides flexibility to the facility owner/operator or certifying PE to determine how best to represent mobile/portable containers on the facility diagram, such as by including a descriptive table or indicating primary storage areas.

6.5.1 Universe of Affected Facilities

Existing facilities would not be affected by this amendment since they would already have SPCC Plans in place. Potentially, all new facilities with mobile or portable containers and all new facilities with containers or piping exempt from this action would be affected by this amendment. However, the Agency expects that new facilities will not be affected by the requirement to mark the exempt containers and piping as the cost of doing this should not be different from including them in the Plan as required earlier. The Agency did not have information on the number of facilities with mobile portable containers, but assumed that all facilities would reasonably have mobile or portable containers. Exhibit 6-24 presents the projected number of new storage and production facilities affected by this amendment over the analysis period.

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Exhibit 6-24
Projected Number of New Facilities Affected by the Facility Diagram Amendment

	Number of New Storage Facilities										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
New Storage Facilities	8,960	9,170	9,390	9,630	9,880	10,200	10,400	10,800	11,100	11,500	**10,100**
New Production Facilities	8,420	6,290	9,050	9,400	9,770	8,950	12,200	7,950	9,120	10,900	**9,210**

6.5.2 Estimated Cost Savings

The cost savings to the facilities would result from a simpler facility diagram and providing a general list of the mobile and portable containers, rather than providing a description of each. The cost reduction would result in a lower labor burden to prepare and review a facility diagram. The cost reduction would also be greater for facilities with a larger number of mobile and portable containers. The Agency does not have data on the distribution of the number of mobile/portable containers at facilities of different types. However, it is reasonable to expect that the number of mobile or portable containers would be positively correlated with the total capacity of the facility: facilities in larger size categories would have larger number of mobile/portable containers. This suggests that the cost savings would be higher for larger facilities and lower for smaller facilities.

The Agency assumes that the amendment would result in approximately 80 percent reduction of the labor burden in preparing and reviewing the mobile/portable containers component of the facility diagram. Since the Agency did not have very accurate estimates on this reduction, the analysis would normally involve presenting results from a sensitivity analysis using high, medium, and low scenarios. However, since the magnitude of savings was expected to be very small, these differences in assumptions would not have resulted in very distinct ranges of estimates.

Based on input a PE firm, EPA assumed that the 10 percent of the cost related to preparing and reviewing facility diagram can be attributed to the mobile/portable containers component.[91] Thus, the cost savings were estimated to be 8 percent of the total labor burden cost of preparing, reviewing, and certifying the facility diagram. Exhibit 6-25 provides the facility-specific cost savings from the final amendments to the facility diagram.[92]

[91] EPA used estimates from SCS Engineers, which routinely prepares and reviews SPCC Plans for a wide range of industries in the 48 contiguous states of the United States.

[92] The estimate presented in this RIA is based on a formal facility diagram. It is likely that more complex facilities might need a formal diagram, while smaller facilities may prepare a sketch. EPA's research shows that engineering diagrams for most enterprises are rather expensive. Admittedly, some diagrams can be drawn on a piece of paper. This kind of diagram may be appropriate for very simple operations. For others, this type of diagram may have no value, and a more robust diagram is required. Patricia Fleming (EPA/ Office of Emergency Management) indicated that, in her experience as an inspector in Region 3, facilities submitted a range of diagrams, many of which were developed for other purposes; thus, the cost would not necessarily be attributable to SPCC.

Exhibit 6-25
Annual Cost Savings from Final Amendments to Facility Diagram Requirements (2007$)[1]

Facility Size	Facility-level Cost Savings	
	Storage Facilities	Production Facilities
Category I	$144	$94
Category II	$288	$188
Category III	$392	$377
Category IV	$547	$565

[1] Cost estimates are based on an 80 percent reduction in the labor burden for preparing, reviewing and certifying the mobile/portable container portion of the facility diagram.

Source: SCS Engineers.

EPA calculated the total compliance cost savings using the projected number of new production and storage facilities and their corresponding per-facility compliance cost savings estimates. EPA estimated that the final amendment to the 2002 SPCC final rule would reduce compliance costs by $3.35 million and $3.32 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-26 presents the total annual cost savings for each year.

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Exhibit 6-26
Projected Annual Compliance Cost Savings from Final Amendments to Facility Diagram Requirements (2007$ Millions)[1]

	Compliance Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$3.04	$2.69	$3.23	$3.33	$3.44	$3.34	$3.98	$3.26	$3.53	$3.91	**$33.7**	**$3.37**
3% Discounted	$2.95	$2.53	$2.95	$2.96	$2.97	$2.79	$3.23	$2.57	$2.70	$2.91	**$28.6**	**$3.35**
7% Discounted	$2.84	$2.35	$2.63	$2.54	$2.45	$2.22	$2.48	$1.90	$1.92	$1.99	**$23.3**	**$3.32**

1 See Appendix K in Volume II for more details on the calculation of cost savings.

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6.5.3 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

6.6 Loading/Unloading Rack

EPA is finalizing a definition for the term “loading/unloading rack,” which governs whether a facility is subject to §112.7(h). Under this amendment, the requirements described at §112.7(h) only apply to areas of a regulated facility where a loading/unloading rack, as defined in §112.2, is located.

EPA is clarifying the applicability of SPCC to loading/unloading racks associated with USTs. The preamble for this final rule states that "…because a loading/unloading rack, or other transfer area, associated with the UST is not typically part of the UST system, it is not subject to all of the technical requirements of 40 CFR part 280 or 281, and is therefore regulated under SPCC in the same manner as any other transfer equipment or transfer activity located at an otherwise regulated SPCC facility." However, the preamble for the 2002 SPCC rule erroneously included a conflicting statement regarding loading/unloading racks associated with USTs. Since EPA did not make any amendments to regulatory language for loading/unloading racks associated with USTs, there will not be any change in facility compliance costs.

EPA is excluding farms and onshore oil and gas production facilities from the loading/unloading rack requirements at §112.7(h). The provision currently excludes all offshore facilities. EPA understands that there are extremely few, if any, loading/unloading racks at oil production facilities. Similarly, EPA understands that the loading and unloading areas associated with oil production tank batteries and farms generally do not have the equipment that meets the definition of loading/unloading rack. In cases where a loading/unloading rack does exist at a farm or onshore oil production facility, the general secondary containment requirements in §112.7(c) would still apply, as it does for loading and unloading areas.

6.6.1 Universe of Affected Facilities

EPA determined that facilities within the following industry sectors are regulated by the loading racks requirement as per the 2002 final SPCC rule and as clarified in the May 2004 Federal Register Notice[93]: oil production facilities, AFVO facilities, military installations and farms. However, EPA is only excluding farms and onshore oil and gas production facilities from the requirements at §112.7(h), so facilities in other industries would not be affected by this final amendment. EPA estimated the number of new and existing farms and onshore oil and gas production facilities to calculate the cost savings and baseline cost of compliance. These estimates are presented in Exhibit 6-27.

The Agency assumed that up to one-third of all production facilities (33 percent) across all size categories would potentially be affected by the clarification to the rule and exclusion of

[93] 69 FR 29728, May 25, 2004.

production facilities. Although EPA did not have data or specific information to estimate the percentage of production facilities that would be affected by this amendment, the Agency expects that the number is not likely to be greater than 33 percent of all SPCC-regulated production facilities. In the absence of additional information, EPA considered a range of potentially affected facilities from 0 percent to 33 percent of the total number of production facilities.

EPA estimated that a minimum of 2 percent and maximum of 14 percent of regulated Category III and IV farms would be affected by this amendment because smaller farms tend not to have loading racks on site. For the low estimate, EPA assumed that 16 farms (2.4 percent of all SPCC-regulated Category III and IV farms) are likely to have a loading rack as per the baseline but would not be required to comply with the loading rack requirement after the final amendment. For the high estimate, EPA estimated that there are approximately 93 farms (14 percent of all SPCC-regulated Category III and IV farms) that have greater than $1 million in annual revenue stream and therefore are likely to have a loading rack as per the baseline but would not be required to comply with the loading rack requirements after the final amendment. Similar to the oil production sector, EPA considered a range of affected farms assuming that 2 percent to 14 percent of all regulated farms would be affected by the final amendment.

Exhibit 6-27 presents the projected number of new and existing facilities from 2010 through 2019 that would be affected by this clarification. The projected average annual number of new facilities was estimated at 0 to 3,070, and the number of existing facilities was estimated at 16 to 82,000, depending on the scenario.[94] EPA projected the number of affected facilities over the 10-year analysis period using the estimated number of SPCC-regulated farms and production facilities and industry-specific growth rates.[95]

[94] Scenarios account for the ranges of affected facilities as described earlier in this section.

[95] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

Exhibit 6-27
Projected Number of New and Existing Facilities Affected by Loading Rack Definition

	Number of New and Existing Facilities Affected										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Low Scenario[1]											
Production											
Existing	0	0	0	0	0	0	0	0	0	0	**0**
New	0	0	0	0	0	0	0	0	0	0	**0**
Farms											
Existing	16	16	16	16	16	16	16	16	16	15	**16**
New	0	0	0	0	0	0	0	0	0	0	**0**
Total											
Existing	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**15**	**16**
New	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Midpoint Scenario[2]											
Production											
Existing	34,400	35,800	36,900	38,400	40,000	41,600	43,100	45,100	46,400	48,000	**41,000**
New	1,400	1,050	1,510	1,570	1,630	1,490	2,040	1,320	1,520	1,820	**1,530**
Farms											
Existing	55	55	54	54	54	54	53	53	53	53	**54**
New	0	0	0	0	0	0	0	0	0	0	**0**
Total											
Existing	**34,500**	**35,900**	**36,900**	**38,500**	**40,000**	**41,600**	**43,100**	**45,200**	**46,500**	**48,000**	**41,000**
New	**1,400**	**1,050**	**1,510**	**1,570**	**1,630**	**1,490**	**2,040**	**1,330**	**1,520**	**1,820**	**1,540**
High Scenario[3]											
Production											
Existing	68,900	71,700	73,800	76,800	79,900	83,200	86,200	90,200	92,900	95,900	**82,000**
New	2,810	2,100	3,020	3,130	3,260	2,980	4,070	2,650	3,040	3,640	**3,070**
Farms											
Existing	94	93	93	92	92	91	91	91	90	90	**92**
New	1	1	1	1	1	1	1	1	1	1	**1**

Exhibit 6-27
Projected Number of New and Existing Facilities Affected by Loading Rack Definition

	Number of New and Existing Facilities Affected										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Total											
Existing	**69,000**	**71,800**	**73,900**	**76,900**	**80,000**	**83,300**	**86,300**	**90,300**	**93,000**	**96,000**	**82,000**
New	**2,810**	**2,100**	**3,020**	**3,130**	**3,260**	**2,980**	**4,070**	**2,650**	**3,040**	**3,640**	**3,070**

[1] The low scenario assumes that 0 percent of production facilities and 2 percent of medium and large farms would be affected.
[2] The midpoint scenario assumes that 17 percent of production facilities and 8 percent of medium and large farms would be affected.
[3] The high scenario assumes that 33 percent of production facilities and 14 percent of medium and large farms would be affected.

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6.6.2 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA estimated the baseline compliance cost for the loading rack requirements for the industries that are likely to be affected by the final amendments to the loading rack requirements. EPA estimates that existing facilities incur recurring costs of complying with the inspection requirement for the lowermost drain and outlets of vehicles at loading areas. The new facilities incur the following three costs: (1) sized secondary containment, (2) providing drainage systems for the tank truck loading/unloading areas or a loading rack, and (3) the recurring expense of the inspection requirement. Exhibit 6-28 presents the facility-level baseline cost of compliance for new and existing facilities.

Exhibit 6-28
Annual Baseline Cost of Compliance with Loading Rack Requirements (2007$)

Size Category	Facility-level Baseline Cost of Compliance	
	Existing Facilities	New Facilities
Production Facilities		
Category I	$161	$161
Category II	$965	$11,300
Category III	$1,930	$12,200
Category IV	$6,430	$16,700
Farms[1]		
Category I	N/A	N/A
Category II	N/A	N/A
Category III	$2,740	$19,200
Category IV	$5,420	$28,000

Source: SCS Engineers.
[1] Category I and II farms are not expected to have loading/unloading racks.

It is important to note that since certain SPCC requirements may be similar in nature to those imposed by state regulations and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. Since regulations vary widely across states and industries, there is no single adjustment factor that could be developed to address this issue for the universe of regulated facilities. However, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. As a result, the estimated compliance costs are likely to present an overestimate of the costs attributed to the SPCC rule. For details of the state overlap analysis, refer to Section 5.4 of this report.

EPA calculated the baseline cost of compliance with loading rack requirements using the projected number of new and existing facilities (Exhibit 6-27) and the corresponding per-facility

cost of compliance estimates before the final amendments (Exhibit 6-28). EPA estimated that the baseline cost of compliance with loading rack requirements is approximately $57.9 million and $57.3 million per year, discounted at 3 percent and 7 percent, respectively.[96] Exhibit 6-29 presents the estimated baseline compliance costs for facilities each year.

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[96] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

Exhibit 6-29
Total Projected Compliance Cost with Loading Rack Requirements (2007$ Millions)

	Compliance Costs										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Low Scenario[1]												
Not Discounted	$0.0466	$0.0464	$0.0462	$0.0460	$0.0458	$0.0456	$0.0454	$0.0452	$0.0450	$0.0448	**$0.457**	**$0.0457**
3% Discounted	$0.0453	$0.0438	$0.0423	$0.0409	$0.0395	$0.0382	$0.0369	$0.0357	$0.0345	$0.0333	**$0.390**	**$0.0458**
7% Discounted	$0.0436	$0.0406	$0.0377	$0.0351	$0.0327	$0.0304	$0.0283	$0.0263	$0.0245	$0.0228	**$0.322**	**$0.0458**
Midpoint Scenario[2]												
Not Discounted	$50.3	$48.2	$53.9	$56.1	$58.3	$58.7	$65.7	$60.7	$64.0	$68.6	**$585**	**$58.4**
3% Discounted	$48.8	$45.4	$49.3	$49.8	$50.3	$49.1	$53.4	$47.9	$49.1	$51.0	**$494**	**$57.9**
7% Discounted	$47.0	$42.1	$44.0	$42.8	$41.6	$39.1	$40.9	$35.3	$34.8	$34.9	**$402**	**$57.3**
High Scenario[3]												
Not Discounted	$101	$96.3	$108	$112	$117	$117	$131	$121	$128	$137	**$1,170**	**$117**
3% Discounted	$97.6	$90.8	$98.6	$99.6	$101	$98.2	$107	$95.8	$98.1	$102	**$989**	**$116**
7% Discounted	$93.9	$84.1	$88.0	$85.5	$83.1	$78.1	$81.8	$70.6	$69.6	$69.7	**$805**	**$115**

[1] The low scenario assumes that 0 percent of production facilities and 2 percent of medium and large farms would be affected.
[2] The midpoint scenario assumes that 17 percent of production facilities and 8 percent of medium and large farms would be affected.
[3] The high scenario assumes that 33 percent of production facilities and 14 percent of medium and large farms would be affected.

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Compliance Cost Savings

EPA estimates that existing facilities that were previously regulated by the loading rack requirements but would not be regulated under the final amendment would incur cost savings from not having to comply with the inspection requirement for the lowermost drain and outlets of the vehicle at loading areas. The new facilities would save on the following three elements: (1) the difference between installing sized and general secondary containment, (2) providing drainage systems for the tank truck loading/unloading areas or a loading rack, and (3) the recurring expense of the inspection requirement. Exhibit 6-30 presents the facility-level cost savings for new and existing facilities. EPA estimated that the cost of general secondary containment at loading racks is approximately 80 percent of the cost of sized containment. Therefore, the cost saving to facilities from requiring general secondary containment instead of sized containment is about 20 percent of the cost of sized containment.

Exhibit 6-30
Facility-level Cost Impact of Loading Rack Amendments (2007$)

Size Category	Facility-level Cost Savings	
	Existing Facilities	New Facilities
Production Facilities		
Category I	$161	$161
Category II	$965	$6,350
Category III	$1,930	$7,320
Category IV	$6,430	$11,800
Farms		
Category I	N/A	N/A
Category II	N/A	N/A
Category III	$2,740	$9,350
Category IV	$5,420	$13,300

Source: SCS Engineers.
[1] Category I and II farms are not expected to have loading/unloading racks.

EPA estimated the total cost savings from the final amendment by multiplying the facility-level cost savings with the total number of facilities affected by this amendment as summarized in the equation below. Using the equation below, EPA estimated that the final amendment to clarify the loading rack definition would reduce compliance costs by approximately $51.4 million and $50.8 million per year, discounted at 3 percent and 7 percent, respectively.[97] Exhibit 6-31 presents the estimated total annual cost savings for affected facilities each year.

[97] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

Calculation of Total Cost Savings

$$\text{Total Cost Savings} = \sum_{i=I}^{IV} \sum_{j=1}^{3} \sum_{k=1}^{3} NFac_{ijk} * NCostSaving_{ijk} * Overlap_i$$

Where *i* = I,II,III and IV are the facility size categories, *j* = low (1), medium (2), and high (3) estimates of facilities, and *k* = 1,2 are the industries affected by the proposed amendments: farms and oil production.

$NFac_{ijk}$ = the projected number of affected facilities for size category *i,* estimate *j,* and industry type *k* (see Exhibit 6-27)

$NCostSaving_{ijk}$ = the per-facility cost savings for size category *i,* estimate *j,* and industry type *k* (see Exhibit 6-30)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22)

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Exhibit 6-31
Total Projected Compliance Cost Savings from Loading Rack Definition (2007$ Millions)[1]

	Compliance Cost Savings										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Low Scenario[2]												
Not Discounted	$0.0452	$0.0450	$0.0448	$0.0446	$0.0444	$0.0442	$0.0440	$0.0439	$0.0437	$0.0435	**$0.443**	**$0.0443**
3% Discounted	$0.0439	$0.0424	$0.0410	$0.0397	$0.0383	$0.0371	$0.0358	$0.0346	$0.0335	$0.0323	**$0.379**	**$0.0444**
7% Discounted	$0.0423	$0.0393	$0.0366	$0.0341	$0.0317	$0.0295	$0.0274	$0.0255	$0.0237	$0.0221	**$0.312**	**$0.0445**
Midpoint Scenario[3]												
Not Discounted	$44.3	$43.7	$47.4	$49.3	$51.3	$52.3	$56.9	$55.0	$57.5	$60.8	**$519**	**$51.9**
3% Discounted	$43.0	$41.2	$43.4	$43.8	$44.3	$43.8	$46.3	$43.4	$44.1	$45.2	**$439**	**$51.4**
7% Discounted	$41.4	$38.2	$38.7	$37.6	$36.6	$34.8	$35.5	$32.0	$31.3	$30.9	**$357**	**$50.8**
High Scenario[4]												
Not Discounted	$88.5	$87.3	$94.8	$98.6	$103	$104	$114	$110	$115	$122	**$1,040**	**$104**
3% Discounted	$85.9	$82.3	$86.8	$87.6	$88.5	$87.5	$92.6	$86.8	$88.1	$90.4	**$877**	**$103**
7% Discounted	$82.7	$76.3	$77.4	$75.3	$73.2	$69.6	$70.9	$64.0	$62.5	$61.8	**$714**	**$102**

1 See Appendix K in Volume II for more details on the calculation of cost savings.
2 The low scenario assumes that 0 percent of production facilities and 2 percent of medium and large farms would be affected.
3 The midpoint scenario assumes that 17 percent of production facilities and 8 percent of medium and large farms would be affected.
4 The high scenario assumes that 33 percent of production facilities and 14 percent of medium and large farms would be affected.

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6.6.3 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

6.7 Tier I Qualified Facilities

6.7.1 Background

EPA is amending the SPCC rule to provide an option for owners and operators of certain qualified facilities with maximum individual aboveground oil container storage capacity of 5,000 gallons (defined as Tier I qualified facilities), to complete and implement a streamlined, self-certified SPCC Plan template in order to comply with the requirements of 40 CFR part 112. These Tier I qualified facilities are a subset of Tier II qualified facilities, which are those that meet these qualifying criteria: (1) aggregate aboveground storage capacity of 10,000 gallons or less; (2) no single discharge exceeding 1,000 U.S. gallons or no two discharges each exceeding 42 U.S. gallons within any 12-month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to 40 CFR part 112 if the facility has been in operation for less than three years (this criterion does not include discharges as described in §112.1(b) that are the result of natural disasters, acts of war, or terrorism).

EPA developed the template to cover, in a simple, user-friendly format, all requirements applicable to these facilities. Through this option, EPA is also eliminating certain requirements, such as the need for a facility diagram, and is streamlining other requirements. However, if the facility owner or operator chooses to use the template SPCC Plan for his/her facility SPCC Plan, he/she is not eligible to use “environmentally equivalent” deviations to required Plan elements, as allowed under §112.7(a)(2), or impracticability determinations with respect to any secondary containment requirements, as provided under §112.7(d).

The Agency assumed that owners and operators of existing facilities would not use this option because they are expected to have an SPCC Plan in place and preparing a template would present an additional expense for those facilities. Correspondingly, EPA assumed that owners and operators of all new qualified facilities with no aboveground containers with capacities greater than 5,000 gallons would take advantage of the reduced requirements and develop a template.

6.7.2 Universe of Affected Facilities

To estimate the number of Tier I facilities, EPA analyzed the data from state agencies that contain information on storage capacities of individual containers. The Agency estimated that 77 percent of the facilities with total storage capacity of 10,000 gallons or less have no storage containers greater than 5,000 gallons in volume and meet the additional qualifying criteria.[98]

[98] EPA estimated the fraction of facilities with total storage capacity of 10,000 gallons that have no aboveground storage containers greater than 5,000 gallons based on state databases used to estimate the SPCC universe.

Exhibit 6-32 presents the projected number of new Tier I qualified facilities from 2010 through 2019. The projected average annual number of new Tier I qualified facilities is 5,780. EPA projected the number of Tier I qualified facilities over the 10-year analysis period using the estimated number of SPCC-regulated facilities with no storage containers greater than 5,000 gallons in volume and industry-specific growth rates.

To estimate the number of Tier I qualified facilities, EPA analyzed the data from state agencies that contain information on storage capacities of individual containers. As a result of this analysis, the Agency estimated the fraction of facilities with the total storage capacity of 10,000 gallons or less that have no storage containers greater than 5,000 gallons in volume and meet the additional qualifying criteria.

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Exhibit 6-32
Projected Number of New Facilities Affected by the Final Amendment for Tier I Qualified Facilities

New Facilities	Number of New Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Facilities with less than 10,000 storage	6,780	6,630	7,100	7,280	7,460	7,510	8,080	7,710	8,040	8,470	**7,510**
Tier I Qualified Facilities (No Aboveground Containers Greater than 5,000 Gallons)	5,220	5,100	5,470	5,600	5,750	5,780	6,220	5,940	6,190	6,520	**5,780**

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The facility estimates presented in Exhibit 6-32 above represent the projected number of facilities that could potentially be "Tier I qualified facilities" based on the capacity of their largest container. Eligibility for the alternative rule requirements, however, also considers the facility's discharge history. According to the amended requirements, a qualified facility cannot have had a single discharge (as described in §112.1(b)) greater than 1,000 gallons or two discharges each greater than 42 gallons during any 12-month period in the past three years. Since only new facilities would be able to take advantage of the final action, EPA assumed that those facilities would have a discharge-free history and, thus, qualify for this option.

Facility owners or operators would have the choice of complying with the existing SPCC rule (as amended in 2006) or taking advantage of the alternative requirements for Tier I qualified facilities. EPA does not know how many facility owners and operators would choose the alternative option.[99] EPA assumed that facility owners and operators would likely choose the alternative requirements if their facility meets the qualifying criteria because it would be less costly than following the requirements that apply to all other facilities. Because the final rule also removes the secondary containment requirements for flowlines and gathering lines at production facilities, the requirement that the owners or operators of Tier I qualified facilities cannot determine secondary containment is impracticable would not result in increased cost for these facilities. Therefore, in this analysis, EPA assumed that owners and operators of all new facilities that meet the Tier I qualified facilities criteria would take advantage of the relief provided by the final amendment.

6.7.3 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA estimated the baseline compliance cost for new Tier I qualified facilities using the projected number of new Tier I qualified facilities and the corresponding per-facility cost of compliance estimates before the final amendment. Exhibit 6-34 itemizes the individual cost components Tier I qualified facilities could be required to fulfill based on the 2002 SPCC final rule.

EPA estimated the baseline compliance cost for new Tier I qualified facilities is $26.9 million and $26.7 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-33 presents the total annual baseline compliance cost for Tier I qualified facilities each year.

[99] The projected number of affected facilities under the SPCC requirements includes farms. Although EPA has extended the compliance dates for farms until it determines specific requirements for this industry, the Agency does not expect these requirements to be more stringent than the rule requirements for qualified facilities. Therefore, EPA expects farms to accrue as much cost savings as qualified facilities from other industries.

Exhibit 6-33
Total Projected Baseline Compliance Cost for New Tier I Qualified Facilities with No Containers Greater than 5,000 Gallons (2007$ Millions)

	Compliance Costs										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Not Discounted	$24.4	$23.9	$25.6	$26.2	$26.9	$27.0	$29.1	$27.8	$29.0	$30.5	**$270**	**$27.0**
3% Discounted	$23.7	$22.5	$23.4	$23.3	$23.2	$22.6	$23.7	$21.9	$22.2	$22.7	**$229**	**$26.9**
7% Discounted	$22.8	$20.8	$20.9	$20.0	$19.2	$18.0	$18.1	$16.2	$15.8	$15.5	**$187**	**$26.7**

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Exhibit 6-34
Annual Baseline Facility-level Compliance Costs for Tier I Qualified Facility

Compliance Requirements	2002 Baseline Annual Cost (before additional cost for template preparation)
New Facilities	
New Plan - 112.3(a)	$4,550
Oil Discharge Reporting - 112.4(c)	$0.19
Modification of Plan - 112.5(a)	$254
Recordkeeping	$371
Total	**$5,170**

Source: SCS Engineers (cost estimates for activities performed by an engineering firm) and RIA for the Final 2006 rule (cost estimates for activities performed by facility personnel, such as information submission in case of an oil discharge and recordkeeping).

Compliance Cost Savings

To assess the impact of the final amendment, EPA estimated the difference in compliance costs for Tier I qualified facilities between the current SPCC rule and the final amendment. Under the amendment, owners and operators of Tier I qualified facilities would have an overall reduction in the burden associated with preparing and modifying an SPCC Plan.

Based on the different compliance requirement options available to Tier I qualified facilities, EPA estimated that annual cost savings for new facilities would be $4,800. Exhibit 6-35 itemizes the individual cost savings that Tier I qualified facilities could incur resulting from the final reduced requirements. The costs savings do not account for the additional compliance activities associated with the template preparation that partially offset these savings. These costs are averaged over all qualified facilities, accounting for the probability that individual facilities would incur the cost. As a result, low probability costs (e.g., complying with §112.4(c)) distributed across many facilities yield only nominal per-facility costs.

Exhibit 6-35
Annual Compliance Costs and Potential Compliance Cost Savings per Tier I Qualified Facility (2007$)

Compliance Requirements	Final Amendment	Annual Cost Savings (before additional cost for template preparation)
		Final Amendment
New Facilities		
New Plan - 112.3(a)	$0.00	$4,550
Oil Discharge Reporting - 112.4(c)	$0.19	-
Modification of Plan - 112.5(a)	$0.00	$254
Recordkeeping	$371	-
Total	**$371**	**$4,800**

The key elements involved in preparing a template SPCC Plan include:

- Assessing aboveground storage tanks for potential discharge on a regular basis or whenever changes are made
- Providing each container with a system or documented procedure to prevent overfills; developing an integrity testing program
- Developing a flow-line maintenance program to prevent discharges from each flowline (applies to production facilities only)
- Filling out the SPCC Plan template.

Exhibit 6-36 presents the estimated number of hours, and associated cost, involved in meeting each of the key elements of the template SPCC Plan option.

Exhibit 6-36
Estimated Additional Costs to New Tier I Qualified Facilities Introduced by the Final Amendment

Template SPCC Plan Elements	Total Burden Hours ($52.2/hr)[1]	Cost ($/Year)[3]
Assess Potential for Discharge	1.07	$57.2
Provide Systems or Procedures for Preventing Overfills	0.86	$46.0
Develop Flowline Maintenance Program[2]	8.00	$429
Develop Integrity Testing Program	0.86	$46.0
Fill out SPCC Plan Template	0.09	$4.7
Total Cost - Storage Facility (98.9% of qualified facilities)	**2.87**	**$154**
Total Cost - Production Facility (1.1% of qualified facilities)	**10.9**	**$583**
Total Cost – Weighted Average		**$159**

[1] All hours are for technical personnel.
[2] Applies to production facilities only.
[3] Cost estimates do not include adjustment for state overlap.

EPA estimated that owners and operators of new Tier I qualified facilities would save $4,800, due to not having to prepare a full SPCC Plan, and would incur an additional cost of $159 when preparing and self-certifying their template SPCC Plan (included in Appendix G of the rule). As a result, Tier I qualified facilities would experience compliance cost savings of $4,640. Because the compliance costs associated with the template SPCC Plan alternative offset a portion of the compliance cost savings estimated for new Tier I qualified facilities in Exhibit 6-36, the overall net compliance cost savings for these facilities would be $4,640 per facility.

EPA calculated the total compliance cost savings for qualified facilities using the projected number of new Tier I qualified facilities and their corresponding per-facility compliance cost savings estimates. EPA calculated the total compliance cost savings for qualified facilities using the projected number of new Tier I qualified facilities and their corresponding per-facility compliance cost savings estimates, which are summarized in the equation below:

$$Total\ Net\ Cost\ Savings = Nfac * (NCost\ Saving - NcostIncrease) * Overlap_1$$

where,

NFac = the projected number of new affected Tier I qualified facilities (see Exhibit 6-32).

NCostSaving = Facility level cost savings for affected Tier I qualified facilities (see Exhibit 6-35).

NCostIncrease = Facility level cost increase for affected Tier I qualified facilities (see Exhibit 6-36).

$Overlap_I$ = 1- estimated percentage reduction in total burden due to state overlap for affected Tier I qualified facilities—Category I (see Exhibit 5-22).

EPA estimated that the final amendment to the 2002 SPCC final rule would reduce compliance costs by $24.1 million and $23.9 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-37 presents the total annual cost savings for Tier I qualified facilities each year.

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Exhibit 6-37
Total Projected Compliance Cost Savings for New Tier I Qualified Facilities with No Containers Greater than 5,000 Gallons (2007$ Millions)[1]

	Compliance Cost Savings										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Not Discounted	$21.9	$21.4	$23.0	$23.5	$24.1	$24.3	$26.1	$24.9	$26.0	$27.4	**$242.6**	**$24.3**
3% Discounted	$21.3	$20.2	$21.0	$20.9	$20.8	$20.3	$21.2	$19.7	$19.9	$20.4	**$205.7**	**$24.1**
7% Discounted	$20.5	$18.7	$18.7	$17.9	$17.2	$16.2	$16.3	$14.5	$14.1	$13.9	**$168.1**	**$23.9**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.7.4 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

In addition, EPA considered the option to provide the same relief as in the preferred option to owners and operators of Tier II qualified facilities with total oil storage capacities of 5,000 gallons or less: to complete and implement a streamlined, self-certified SPCC Plan template in order to comply with the requirements of 40 CFR part 112. However, EPA did not select this option. As with the preferred option, qualified facilities are those that meet the following qualifying criteria: facilities that have had no single discharge exceeding 1,000 U.S. gallons or no two discharges each exceeding 42 U.S. gallons within any 12-month period in the three years prior to the SPCC Plan self-certification date, or since becoming subject to 40 CFR part 112, if the facility has been in operation for less than three years (this criterion does not include discharges as described in §112.1(b) that are the result of natural disasters, acts of war, or terrorism).

The Agency assumed that existing facilities would not use this option because they are expected to have an SPCC Plan in place, and preparing a template would present an additional expense for those facilities. Correspondingly, EPA assumed that all new qualified facilities with total oil storage capacity of 5,000 gallons or less would take advantage of the reduced requirements and develop a template.

6.7.5 Universe of Affected Facilities

EPA estimated that approximately 4,180 new facilities with oil storage capacities of 5,000 gallons or less would be subject to SPCC in the first year of the amended rule. Over the next 10 years, approximately 4,700 new facilities with storage capacities of 5,000 gallons or less would be subject to SPCC each year on average.[100]

Exhibit 6-38 presents the projected number of new Tier I qualified facilities under the alternative option from 2010 through 2019. EPA projected the number of Tier I facilities under the alternative option using the estimated number of SPCC-regulated facilities with storage capacity of 5,000 gallons or less and industry-specific growth rates.

[100] See Chapter 4 on the SPCC universe for more information regarding how the industry estimates were calculated.

Exhibit 6-38
Projected Total Number of New Tier I Qualified Facilities with Total Storage Capacity of less than 5,000 Gallons (2007$ Millions)

New Facilities	Number of New Facilities Affected by the Alternative Option										
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	10-Year Average
Facilities with Total Storage Capacity of less than 5,000 Gallons	4,300	4,340	4,460	4,550	4,640	4,720	4,870	4,910	5,040	5,180	**4,700**

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The facility estimates presented in Exhibit 6-38 above represent the projected number of facilities that could be "Tier I qualified facilities" based on their storage capacity alone. As in the preferred option, eligibility for the alternative rule requirements, however, also considers the facility's discharge history. According to the amended requirements, a qualified facility cannot have had a single discharge (as described in §112.1(b)) greater than 1,000 gallons or two discharges each greater than 42 gallons during any 12-month period in the past three years. Since only new facilities would be able to take advantage of the proposed option, EPA assumed that those facilities would have a discharge-free history and thus, qualify for this option.

Facility owners or operators would have the choice of complying with the existing SPCC rule (as amended in 2006) or taking advantage of the alternative requirements for Tier I qualified facilities. EPA does not know how many facility owners and operators would choose the alternative option.[101] EPA assumed that facility owners and operators would likely choose the alternative requirements if their facility meets the qualifying criteria because it would be less costly than following the requirements that apply to all other facilities. In this analysis, EPA assumed that all new facilities that meet the Tier I qualified facilities criteria would take advantage of the relief provided by the final amendment.

6.7.6 Estimated Cost Savings

Compliance Cost Savings

The facility-level compliance cost savings for this alternative are the same as for the final option; the difference in cost comes from the number of Tier I qualified facilities. The net compliance cost savings for these facilities would be $4,640 per facility.

EPA calculated the total compliance cost savings for qualified facilities using the projected number of new Tier I qualified facilities and their corresponding per-facility compliance cost savings estimates, which is summarized in the equation below:

EPA estimated that this proposed option would reduce compliance costs by $19.6 million and $19.5 million per year, discounted at 3 percent and 7 percent, respectively. Exhibit 6-39 presents the total annual cost savings for Tier I qualified facilities each year. However, EPA did not select this option.

[101] The projected number of affected facilities under the SPCC requirements includes farms. Although EPA has extended the compliance dates for farms until it determines specific requirements for this industry, the Agency does not expect these requirements to be more stringent than the rule requirements for qualified facilities. Therefore, EPA expects farms to accrue as much cost savings as qualified facilities from other industries.

Exhibit 6-39
Total Projected Compliance Cost Savings for Tier I Qualified Facilities with Total Storage less than 5,000 Gallons under the Alternative Option (2007$ Millions)[1]

	Compliance Cost Savings										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Not Discounted	$18.1	$18.2	$18.7	$19.1	$19.5	$19.8	$20.5	$20.6	$21.1	$21.8	**$197**	**$19.7**
3% Discounted	$17.5	$17.2	$17.1	$17.0	$16.8	$16.6	$16.6	$16.3	$16.2	$16.2	**$168**	**$19.6**
7% Discounted	$16.9	$15.9	$15.3	$14.6	$13.9	$13.2	$12.7	$12.0	$11.5	$11.1	**$137**	**$19.5**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.8 General Secondary Containment

At a facility subject to the SPCC rule, all areas with the potential for a discharge are subject to the general secondary containment provision. These areas may have loading/unloading areas (also referred to as transfer areas), piping, and/or mobile refuelers, and may include other areas of a facility where oil is present. The general secondary containment provision requires that these areas be designed with appropriate containment and/or diversionary structures to prevent a discharge that may be harmful (a discharge as described in 40 CFR part 110 into or upon navigable waters of the United States or adjoining shorelines; see §112.1(b)).

EPA is amending the general secondary containment requirement in three ways: (1) by adding text regarding the method, design and capacity of secondary containment; (2) by specifically allowing both active and passive measures of secondary containment; and (3) by including additional examples of prevention systems. This revision clarifies the applicability of general secondary containment consistent with the explanation found in *SPCC Guidance for Regional Inspectors* (Volume 1, December 2005) regarding the method, design, and capacity of secondary containment. Since this amendment only provides a clarification and does not change the existing regulatory requirements, it is not expected to result in any change in facility compliance costs. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

6.9 General Secondary Containment for Non-Transportation-Related Tank Trucks

In the December 2006 amendments to the SPCC rule, EPA exempted mobile refuelers from the sized secondary containment requirements applicable to bulk storage containers. In recognition of the fact that non-transportation-related tanker trucks are similar to mobile refuelers, and may have the same difficulty in complying with the sized secondary containment requirements, EPA is extending the regulatory amendment provided to mobile refuelers in 2006 to non-transportation-related tank trucks at a facility subject to the SPCC rule. Such tank trucks include those used to store for short periods of time and transport fuel, crude oil, condensate, non-petroleum, or other oils for transfer to or from bulk storage containers (e.g., a truck used to refill oil-filled equipment at an electrical substation or a pump truck at an oil production facility). Under this approach, the general secondary containment requirements at §112.7(c) still applies. However, this exemption to sized secondary containment would not apply to a vehicle used primarily for the bulk storage of oil in a stationary location, in place of a fixed oil storage container.

Although certain facilities operate non-transportation-related tanker trucks storing oil for short periods of time, EPA does not have sufficient information to quantify the savings associated with the exemption of these trucks from sized secondary containment of §§112.8(c)(2) and 112.12(c)(2).

6.10 Security

EPA is amending the rule to allow facility owner/operators to tailor their security measures to the facility's specific characteristics and location, rather than comply with the current, more prescriptive set of requirements. This would provide a facility owner/operator with the flexibility to determine the most adequate security measures to protect the facility from vandalism and to assist in the discovery of oil discharges. For example, the final amendment relaxes the requirement to have fencing around the entire facility; to secure and control access to the oil handling, processing, and storage areas of a facility, an owner/operator may choose to install fencing around only these areas.

Because the security requirements, found at §112.7(g), are currently subject to environmental equivalence under §112.7(a)(2), a facility owner/operator currently has flexibility to provide tailored security measures, if he or she can demonstrate how the measures are environmentally equivalent to the required measures in §112.7(g). The final amendment reduces this hurdle of demonstrating environmental equivalence; facilities would save costs from not having to determine environmental equivalence.

6.10.1 Universe of Affected Facilities

The Agency estimated that all new storage facilities would potentially be affected by this change. Production facilities would not be affected by this amendment because the security requirements in §112.7(g) do not apply to these facilities. Since existing facilities would have already installed the security measures as per the 2002 rule amendments or demonstrated environmental equivalence for tailored security measures, they would not be affected by the rule. EPA does not have data to determine the exact number of facilities but expects that facilities in all industry categories would use the flexibility in tailoring the security measures. In the absence of data, EPA developed cost estimates for a low (50 percent), medium (75 percent), and high (100 percent) percentage of facilities (see Exhibit 6-40).

Exhibit 6-40
Projected Total Number of New Affected Storage Facilities

	Number of New Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Low Scenario (50 percent of facilities)	4,480	4,590	4,700	4,810	4,940	5,080	5,220	5,380	5,550	5,730	**5,050**
Medium Scenario (75 percent of facilities)	6,720	6,880	7,050	7,220	7,410	7,620	7,830	8,070	8,320	8,600	**7,570**
High Scenario (100 percent of facilities)	8,960	9,170	9,390	9,630	9,880	10,200	10,400	10,800	11,100	11,500	**10,100**

6.10.2 Baseline Compliance Cost and Cost Savings

EPA assumed that under the current rule, given the high cost of fencing, all facilities would use tailored security measures and demonstrate how these measures are environmentally equivalent to the required measures in §112.7(g).[102] Therefore, the cost savings to the facility would result from not having to determine environmental equivalence and will be equal to the baseline cost of compliance with the security requirements. EPA estimates that the cost savings per facility (and the baseline cost of compliance with security requirements) would range from $1,230 to $2,530, depending on facility size (see Exhibit 6-41).[103] The difference in cost estimates across the facility size categories is explained by the difference in labor hours to demonstrate environmental equivalence.

Exhibit 6-41
Cost of Demonstrating Environmental Equivalence (2007$)[1]

Facility Size	Facility-level Cost of Demonstrating Environmental Equivalence
	Storage Facilities
Category I	$1,230
Category II	$1,840
Category III	$1,840
Category IV	$2,530

[1] Cost estimates based on labor burden for explaining why secondary containment is impracticable. Cost estimates do not include adjustment for state overlap.

Source: SCS Engineers.

EPA calculated the total compliance cost savings using the projected number of new production and storage facilities and their corresponding per-facility compliance cost savings estimates, which is summarized in the equation below:

[102] EPA estimates the cost of fencing is approximately $1.9 per feet, which implies that fencing the whole facility versus just fencing storage areas can have a significant impact on the cost. (Source: SCS Engineers.)

[103] The estimate for providing environmental equivalence for security measures is based on a general estimate for environmental equivalence provided by SCS Engineers.

Calculation of Total Cost Savings

$$\text{Total Cost Savings}_j = \sum_i NFac_{ij} * NCostSaving_{ij} * Overlap_i$$

Where *i* = I,II,III, and IV are the facility size categories, and *j* = low, medium, and high estimates of facilities affected by the proposed amendments

$NFac_{ij}$ = the projected number of affected facilities for size category *i* (see Exhibit 6-40)

$NCostSaving_{ij}$ = the medium estimate for the per-facility cost savings for size category *i* (see Exhibit 6-41)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22)

Using the equation above, EPA estimated that the final amendment to the 2002 SPCC final rule would reduce compliance costs by $6.21 million and $6.16 million per year, discounted at 3 percent and 7 percent, respectively in the low scenario (50 percent); $9.32 million and $9.24 million per year, discounted at 3 percent and 7 percent, respectively in the midpoint scenario (75 percent) and $12.4 million and $12.3 million per year, discounted at 3 percent and 7 percent, respectively in the high scenario (100 percent).[104] Exhibit 6-42 presents the total annual cost savings for each year.

[104] Also equal to the baseline cost of compliance with security requirements.

Exhibit 6-42
Projected Annual Compliance Cost Savings from Final Amendments to Security Requirements (2007$ Millions)[1]

	Cost Savings[2]											
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	10- Year Present Value	Annualized
Low Scenario (50%)												
Not Discounted	$5.55	$5.68	$5.82	$5.97	$6.12	$6.29	$6.47	$6.67	$6.88	$7.10	**$62.6**	**$6.26**
3% Discounted	$5.39	$5.36	$5.33	$5.30	$5.28	$5.27	$5.26	$5.26	$5.27	$5.28	**$53.0**	**$6.21**
7% Discounted	$5.19	$4.96	$4.75	$4.55	$4.37	$4.19	$4.03	$3.88	$3.74	$3.61	**$43.3**	**$6.16**
Midpoint Scenario (75%)												
Not Discounted	$8.33	$8.52	$8.73	$8.95	$9.18	$9.44	$9.71	$10.0	$10.3	$10.7	**$93.8**	**$9.38**
3% Discounted	$8.09	$8.03	$7.99	$7.95	$7.92	$7.91	$7.89	$7.89	$7.91	$7.93	**$79.5**	**$9.32**
7% Discounted	$7.78	$7.45	$7.13	$6.83	$6.55	$6.29	$6.05	$5.82	$5.61	$5.42	**$64.9**	**$9.24**
High Scenario (100%)												
Not Discounted	$11.1	$11.4	$11.6	$11.9	$12.2	$12.6	$12.9	$13.3	$13.8	$14.2	**$125**	**$12.5**
3% Discounted	$10.8	$10.7	$10.7	$10.6	$10.6	$10.5	$10.5	$10.5	$10.5	$10.6	**$106**	**$12.4**
7% Discounted	$10.4	$9.93	$9.50	$9.10	$8.73	$8.39	$8.06	$7.76	$7.48	$7.22	**$86.6**	**$12.3**

[1] The baseline cost of compliance is the same as the cost savings.
[2] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.11 Integrity Testing

EPA is amending the integrity testing requirements at §§112.8(c)(6) and 112.12(c)(6) to provide flexibility in complying with the bulk storage container integrity testing requirements. Specifically, EPA is modifying the provision to allow an owner or operator to consult and rely on industry standards to determine the appropriate qualifications for tank inspectors/testing personnel and the type and frequency of integrity testing required for a particular container size and configuration. Thus, this action extends the streamlined bulk storage container integrity testing requirement that EPA provided to qualified facilities in the December 2006 SPCC rule amendments (71 FR 77266, December 26, 2006) to all facilities subject to the integrity testing provision.

6.11.1 Universe of Affected Facilities

Since the integrity-testing requirement applies only to storage facilities (and not production facilities), EPA estimates that all new storage facilities would be affected by this amendment. Only containers with storage capacity of less than 5,000 gallons that are portable or shop-built would be affected because industry standards for these containers are different from the SPCC requirements; therefore, containers of 5,000 gallons and larger would not be affected by the final change. For this cost estimate, EPA assumed that all existing facilities are currently using the STI SP-001 standard and performing only external inspections for small portable containers and shop-built tanks up to 5,000 gallons in capacity, instead of visual inspection plus a system of non-destructive shell testing such as hydrostatic testing, radiographic testing, ultrasonic testing, etc., as required under the integrity-testing requirement. Therefore, existing facilities would not be affected because they would have already certified the environmental equivalence of their inspection standards. Exhibit 6-43 presents the projected number of new facilities that would be affected by this final amendment from 2010 through 2019. The projected average annual number of new storage facilities is 10,100. EPA projected the number of new storage facilities over the 10-year analysis period using the estimated number of SPCC-regulated facilities and industry-specific growth rates.[105]

Exhibit 6-43
Projected Number of New Storage Facilities Affected by the Integrity Testing Amendment

	Number of New Storage Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
New Facilities	8,960	9,170	9,390	9,630	9,880	10,200	10,400	10,800	11,100	11,500	**10,100**

6.11.2 Baseline Cost of Compliance and Cost Savings

EPA assumed that all facilities would use the STI SP-001 standard and perform external inspections only for portable containers and for small shop-built tanks up to 5,000-gallons, instead of visual inspection, plus a form of non-destructive shell testing as required under the

[105] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

integrity-testing provision.[106] This implies that facilities would save the cost incurred for preparing an environmental equivalence statement and having a PE certify environmental equivalence statements in SPCC Plans, equal to the baseline cost of compliance with integrity testing requirements for small shop-built tanks. Since existing facilities would have already incurred this cost, only new facilities would have cost savings from this amendment. The Agency estimates that the cost savings per facility for all size categories for not having to claim environmental equivalence would be $1,230.

EPA calculated the total compliance cost savings (and the baseline cost of compliance) using the projected number of new facilities and their corresponding per-facility compliance cost savings estimates, which is summarized in the equation below:

Calculation of Total Cost Savings

$$\textit{Total Cost Savings} = \sum_{i=I}^{IV} NFac_i * NCostSaving * Overlap_i$$

Where i = I, II, III and IV are facility size categories

$NFac_i$ = the projected number of new non-production facilities affected by the amendment (see Exhibit 6-43)

NCostSaving = Facility level cost savings (see this section)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22)

Using the equation above, EPA estimated that the final amendment to the 2002 SPCC final rule would reduce compliance costs by $11.1 million and $11.1 million per year, discounted at 3 percent and 7 percent, respectively.[107] Exhibit 6-44 presents the total annual cost savings for the integrity testing amendments each year.

[106] EPA considered API 653, but because it does not provide differentiated requirements for small shop-built tanks, the STI SP-001 standard was used.

[107] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision. Also equal to the baseline cost of compliance for integrity testing.

Exhibit 6-44
Total Projected Compliance Cost Savings from Integrity Testing Amendment (2007$ Millions)[1,2]

	Compliance Cost Savings										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Not Discounted	$9.96	$10.2	$10.4	$10.7	$11.0	$11.3	$11.6	$12.0	$12.3	$12.7	**$112**	**$11.2**
3% Discounted	$9.67	$9.61	$9.56	$9.51	$9.48	$9.46	$9.44	$9.44	$9.46	$9.48	**$95.1**	**$11.1**
7% Discounted	$9.31	$8.90	$8.52	$8.17	$7.83	$7.52	$7.23	$6.96	$6.71	$6.48	**$77.6**	**$11.1**

1 Baseline compliance cost is the same as the cost savings.
2 See Appendix K in Volume II for more details on the calculation of cost savings.

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6.12 Animal Fats and Vegetable Oils

6.12.1 Background

EPA is amending the rule requirements by providing differentiated integrity testing requirements for facilities that handle certain types of animal fats and vegetable oils. EPA is providing the PE or an owner or operator self-certifying an SPCC Plan with the flexibility to use a visual inspection program for integrity testing that is appropriate for containers that store AFVOs that meet certain criteria. This flexibility applies to those bulk storage containers that are subject to the applicable sections of the Food and Drug Administration (FDA) regulation 21 CFR part 110, Current Good Manufacturing Practice in Manufacturing, Packing or Holding Human Food, and that meet the following additional criteria: (1) the containers are elevated; (2) the containers are made from austenitic stainless steel; (3) the containers have no external insulation; and (4) the containers are shop-built.

6.12.2 Universe of Affected Facilities

In the regulatory impact analysis (RIA) of the final rule amendments published on December 26, 2006, EPA estimated that 7,640 facilities produce or store AFVOs, comprising approximately 1 percent of the regulated universe. Of the 7,640 facilities that EPA estimates to be AFVO facilities, the Agency excluded the facilities that process food for pets or use vegetable oil in non-food production related activities. The remaining 7,390 are assumed to store food oils in addition to other non-food oils that are used for heating or manufacturing processes and therefore are affected by the final amendments. Further, all new facilities would also be affected by this change.

In addition to the requirement that the containers should store food oils, the final amendment also requires that the containers be shop-built, made of austenitic stainless steel, elevated with no external insulation, and be covered by 21 CFR part 110. The preferred option relies on the judgment of a PE to determine if the tank should be eligible for differentiated integrity testing requirements. To account for this, the Agency assumed that only a certain percentage of food oil storage tanks would be affected because of the final amendments. To simplify the analysis, EPA assumed that all food oil containers at a facility are subject to the same integrity testing requirements. The Agency contacted industry experts, who determined that 40 percent to 90 percent of containers at AFVO facilities are made of stainless steel.[108] Further, they noted that 21 CFR part 110 applies to many AFVO facilities. Therefore, based on professional judgment, the Agency assumed that 40 percent (low), 65 percent (medium), and 90 percent (high) of the 7,390 facilities would have food oil tanks that are eligible (see Exhibit 6-45).

[108] Personal communication with Don Zink, U.S. Food & Drug Administration, February 2007; and Gary Boley, InterSpec LLC (tank inspecting company), February 2004.

Exhibit 6-45
Projected Total Number of New and Existing AFVO Facilities Affected by the Final Amendment

	Number of AFVO Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Existing Facilities											
100%	7,790	7,820	7,860	7,890	7,930	7,960	8,000	8,030	8,070	8,100	**7,950**
90%	7,010	7,040	7,070	7,100	7,130	7,170	7,200	7,230	7,260	7,290	**7,150**
65%	5,060	5,090	5,110	5,130	5,150	5,180	5,200	5,220	5,240	5,270	**5,160**
40%	3,120	3,130	3,140	3,160	3,170	3,180	3,200	3,210	3,230	3,240	**3,180**
New Facilities											
100%	181	182	183	184	185	185	186	187	188	189	**185**
90%	163	164	165	165	166	167	168	168	169	170	**166**
65%	118	118	119	119	120	120	121	122	122	123	**120**
40%	72	73	73	74	74	74	75	75	75	75	**74**

6.12.3 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA calculated the baseline cost of compliance for integrity testing requirements at AFVO facilities using the projected number of new and existing AFVO facilities and the corresponding per-facility cost of compliance estimates for integrity testing before the final amendments. The estimates for facility-level compliance cost (see Exhibit 6-46) are based on specific assumptions developed from a review of SPCC Plans, such as the number of tanks per facility by size category, the total capacity, and other facility characteristics, such as the type of secondary containment used (see Appendix L in Volume II).

Exhibit 6-46
Estimated Baseline Facility-Level Integrity Testing by Facility Size Category (2007$)

Cost Item	Category I	Category II	Category III	Category IV
Integrity Testing[1]	$1,500	$6,000	$12,000	$24,000
Test Frequency[2]	Every 12 years			
Annual Baseline Cost of Compliance	**$125**	**$500**	**$1,000**	**$2,000**

[1] The cost estimate reflects hydrostatic testing, non-destructive shell thickness testing.
[2] Estimated as an average time period over which facility owner/operators conduct integrity testing.
Source: Facility visits; SCS Engineers.

The Agency estimates that the baseline cost of compliance for integrity testing requirements at AFVO facilities is $2.97 million and $2.96 million discounted at 3 percent and 7 percent, respectively (see Exhibit 6-47).

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Exhibit 6-47
Total Projected Baseline Compliance Cost for Integrity Testing Requirement at AFVO Facilities (2007$ Millions)

	Compliance Costs										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Not Discounted	$2.91	$2.93	$2.94	$2.95	$2.96	$2.98	$2.99	$3.00	$3.02	$3.03	**$29.7**	**$2.97**
3% Discounted	$2.83	$2.76	$2.69	$2.62	$2.56	$2.49	$2.43	$2.37	$2.31	$2.25	**$25.3**	**$2.97**
7% Discounted	$2.72	$2.56	$2.40	$2.25	$2.11	$1.98	$1.86	$1.75	$1.64	$1.54	**$20.8**	**$2.96**

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Compliance Cost Savings

EPA is differentiating the integrity testing requirements for facilities that handle food oils stored in containers that are corrosion free and are austenitic stainless steel tanks or tanks made with equally corrosion-resistant materials that are in good repair and have smooth, impervious, corrosion-free, easily cleanable food oil contact surfaces. In addition, the containers should be elevated to facilitate complete drainage of the container to prevent corrosion.

Although it is possible that a PE would require that the qualified AFVO firms conduct integrity testing but a less costly type, the Agency assumed that all facilities that meet the above criteria would, in effect, be eligible to conduct visual inspections for these containers. Further, EPA assumed that facilities would not incur any additional cost for visual inspection of these containers.[109]

However, AFVO facilities that produce or store food oils are likely to also store other non-food and petroleum oil. Facilities would have to comply with integrity testing requirements for the non-food oil containers. To assess the ratio of food oil storage to total oil storage capacity, the Agency relied on SPCC Plans obtained from AFVO facilities. Although these facilities are not representative of the entire AFVO universe, in the absence of other data, these Plans provide a range of possible values for the ratio of food oil to non-food oil at these facilities.[110]

The SPCC Plans suggest that on average, 93 percent of an AFVO facility's total storage is for AFVO. Therefore, EPA assumed that facilities eligible for these differentiated requirements for visual inspection would save 93 percent of their total cost of integrity testing. To make this assumption, EPA also assumed that the integrity testing costs are proportional to the storage capacity. Given the data from a PE firm, this seems to be a reasonable assumption on average. It should be noted that EPA also assumed that all the vegetable oil stored at a facility is food grade and is not waste oil; the SPCC Plans considered did not distinguish between the two grades.

Exhibit 6-48 lists the average cost of integrity testing of tanks by facility category.

[109] SCS Engineers indicated that daily visual inspections of tanks are assumed to incur negligible costs.

[110] SPCC Plans: Cargill, Inc., Lafayette, Indiana, December 2003, Revised September 2006. ConAgra Foods, Packaged Foods Company Inc., Sylvester, Georgia, December 2005. Seattle Biodiesel LLC Manufacturing Facility, Seattle, Washington, April 2006. Frito-Lay North America, Inc., Rancho Cucamonga Facility, Rancho Cucamonga, California, November 2006. Peter Cremer North America, LP, South Terminal, Cincinnati, Ohio, June 2006.

Exhibit 6-48
Estimated Facility-Level Integrity Testing by Facility Size Category (2007$)

Cost Item	Category I	Category II	Category III	Category IV
Integrity Testing[1]	$1,500	$6,000	$12,000	$24,000
Test Frequency[2]	Every 12 years			
Annual Cost Savings	**$125**	**$500**	**$1,000**	**$2,000**

[1] The cost estimate reflects hydrostatic testing, non-destructive shell thickness testing. Unit costs range from $500 to $2,500 per tank for hydrostatic testing. EPA assumed that the number of tanks per typical facility would be 1, 4, 8, and 16 for Category I, II, III, and IV facilities, respectively. This assumption was based on estimates obtained from SCS Engineers as well as state oil tank databases.

[2] Estimated as an average time period over which facility owner/operators conduct integrity testing.

Source: Facility visits; SCS Engineers.

EPA calculated the total compliance cost savings for AFVO facilities using the projected number of facilities affected by the final amendments and their corresponding per-facility compliance cost savings estimates, as summarized in the equation below:

Calculation of Total Cost Savings

$$Total\ Cost\ Savings = \sum_i \sum_j NFac_{ij} * NCostSaving_i * Overlap_i$$

Where i = I,II,III, and IV are the facility size categories, and j = low, medium, and high estimates of facilities affected by the proposed amendments

$NFac_i$ = the projected number of affected AFVO qualified facilities by size category (see Exhibit 6-45)

$NCostSaving_i$ = the per facility cost savings based on compliance options available to AFVO facilities storing food oils by size category (see Exhibit 6-48)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22)

The Agency estimates that the AFVO facilities would save $1.19 million and $1.19 million discounted at 3 percent and 7 percent discount rate, respectively (low estimate) to $2.67 million and $2.67 million, discounted at 3 percent and 7 percent discount rate, respectively (high estimate) from the final amendments (see Exhibit 6-49).[111]

[111] Estimates at 3 percent and 7 percent discount rates are the same at this level of precision.

Exhibit 6-49
Total Projected Compliance Cost Savings for AFVO Facilities from Final Amendments (2007$ Millions)[1]

	Compliance Cost Savings										10- Year Present Value	Annualized
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10		
Low Scenario (40%)												
Not Discounted	$1.17	$1.17	$1.18	$1.18	$1.19	$1.19	$1.20	$1.20	$1.21	$1.21	**$11.9**	**$1.19**
3% Discounted	$1.13	$1.10	$1.08	$1.05	$1.02	$0.998	$0.973	$0.948	$0.925	$0.902	**$10.1**	**$1.19**
7% Discounted	$1.09	$1.02	$0.960	$0.901	$0.846	$0.794	$0.745	$0.699	$0.656	$0.616	**$8.33**	**$1.19**
Midpoint Scenario (65%)												
Not Discounted	$1.89	$1.90	$1.91	$1.92	$1.93	$1.94	$1.94	$1.95	$1.96	$1.97	**$19.3**	**$1.93**
3% Discounted	$1.84	$1.79	$1.75	$1.70	$1.66	$1.62	$1.58	$1.54	$1.50	$1.47	**$16.5**	**$1.93**
7% Discounted	$1.77	$1.66	$1.56	$1.46	$1.37	$1.29	$1.21	$1.14	$1.07	$1.00	**$13.5**	**$1.93**
High Scenario (90%)												
Not Discounted	$2.62	$2.63	$2.65	$2.66	$2.67	$2.68	$2.69	$2.70	$2.72	$2.73	**$26.7**	**$2.67**
3% Discounted	$2.55	$2.48	$2.42	$2.36	$2.30	$2.24	$2.19	$2.13	$2.08	$2.03	**$22.8**	**$2.67**
7% Discounted	$2.45	$2.30	$2.16	$2.03	$1.90	$1.79	$1.68	$1.57	$1.48	$1.39	**$18.7**	**$2.67**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.12.4 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the AFVO facilities.

6.13 Oil and Gas Production Sector

6.13.1 Background

Since its original promulgation in 1973, the SPCC rule has included differentiated requirements for oil production facilities, which are provided in §112.9. Under this final rulemaking, EPA is finalizing specific modifications for oil production facilities. In particular, EPA is finalizing the following modifications: excluding oil production facilities from the loading/unloading rack requirements at §112.7(h); revising the definition of "production facility"; extending the timeframe by which the owner or operator of a new oil production facility must prepare and implement an SPCC Plan; providing an alternative option for flow-through process vessels at oil production facilities to comply with the general secondary containment requirement and additional oil spill prevention measures in lieu of sized secondary containment requirements; providing an exemption for certain intra-facility gathering lines from the SPCC requirements; providing an alternative option for flowlines and intra-facility gathering lines at oil production facilities for contingency planning in lieu of all secondary containment requirements, while establishing more prescriptive requirements for a flowline/intra-facility gathering line maintenance program; providing compliance alternatives for certain produced water containers and any associated piping and appurtenances downstream of the container that do not contain oil as certified by a PE; providing compliance alternatives to sized secondary containment for produced water storage containers that are not otherwise exempt; establishing alternative criteria for an oil production facility to be eligible to self-certify an SPCC Plan as a qualified facility; and clarifying the definition of "permanently closed" as it applies to an oil production facility.

6.13.2 Universe of Affected Facilities

EPA estimated that 215,000 oil and gas production facilities would be subject to the SPCC rule in 2010. The number of production facilities affected varies for each individual final rule amendment. Therefore, the universe of affected facilities is discussed separately for each of the amendments in the sections below.

6.13.3 Definition of "Production Facility"

EPA is modifying the definition of "production facility" to clarify which specific provisions of the rule may apply, consistent with the definition of "facility." Because the Agency is only providing clarity on the applicability of the rule, there would be no cost impact from the amended definition of "production facility."

6.13.4 Modifications to §112.9 for Drilling and Workover Facilities

To clarify that drilling and workover activities are not subject to the provisions at §112.9, EPA is amending the title of §112.9 to read "Spill Prevention, Control, and Countermeasure Plan

requirements for onshore oil production facilities (excluding drilling and workover facilities)." EPA is also amending the introductory sentence of the section accordingly. Because the Agency is only providing clarity on the applicability of the rule, there would be no cost impact from the specified exclusion of drilling and workover facilities.

6.13.5 SPCC Plan Preparation and Implementation

6.13.5.1 Background

EPA is amending §112.3(b) to extend the timeframe by which a production facility that becomes operational after July 1, 2009, must prepare and implement an SPCC Plan. Under the current rule, any facility that becomes operational after July 1, 2009 (a "new facility"), must prepare an SPCC Plan before beginning operations. However, production facilities have unique characteristics during the start-up period of their operations, which lead to variability in the amount and type of oil handled. This would imply that production facilities must continually amend Plans until operations stabilize, and have a licensed Professional Engineer (PE) certify each amendment. To alleviate this burden, EPA is giving a new production facility six months to prepare and implement an SPCC Plan.

6.13.5.2 Universe of Affected Facilities

EPA assumed that only 75 percent of production facilities would be affected by the rule change and would save the cost to amend the Plan and the PE certification cost. The remaining 25 percent of the facilities were assumed to be correct in their original predictions of the oil well's flow, and would therefore not need to amend the Plan.[112]

Exhibit 6-50 presents the projected number of new production facilities that would be affected by this final amendment from 2010 through 2019. The projected average annual number of new production facilities is 6,910. EPA projected the number of new production facilities over the 10-year analysis period using the estimated number of SPCC-regulated production facilities and industry-specific growth rates.[113]

Exhibit 6-50
Projected Total Number of New Production Facilities Affected by the Final Amendment to SPCC Plan Preparation and Implementation[1]

Oil Production Industry	Number of New Production Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Category I	807	603	868	901	937	858	1,170	763	875	1,050	883
Category II	4,350	3,250	4,680	4,860	5,050	4,630	6,310	4,110	4,720	5,640	4,760
Category III	1,140	854	1,230	1,280	1,330	1,220	1,660	1,080	1,240	1,480	1,250
Category IV	11	8	12	13	13	12	16	11	12	15	12
Total	**6,310**	**4,720**	**6,790**	**7,050**	**7,330**	**6,710**	**9,160**	**5,960**	**6,840**	**8,180**	**6,910**

[1] The number of affected new production facilities represents 75 percent of the total new production facilities.

[112] Personal communication with Richard Franklin of EPA Region 6, February 2006.

[113] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

6.13.5.3 Baseline Compliance Cost and Cost Savings

Baseline Cost of Compliance

The baseline compliance cost incurred by oil production facilities for preparing and implementing the SPCC Plan is the same the total cost of compliance with the SPCC rule. For 75 percent of the facilities, the baseline cost also includes the cost the oil production facilities might incur in having to amend the Plan and have it certified by a PE after operations have stabilized in the first year.

EPA calculated the baseline cost of compliance for production facilities using the projected number of new production facilities and the corresponding per-facility cost of compliance estimates before the final amendments. EPA estimated that the total cost of complying with the 2002 SPCC rule for a new production facility is $37,600 for facilities in size Category I, $58,400 for Category II, $148,000 for Category III, and $411,000 for Category IV (Exhibit 6-51). Exhibit 6-52 presents the assumptions for production facilities in Categories I, II, III, and IV.

Exhibit 6-51
Annual Cost of Compliance
with 2002 SPCC Rule Requirements (2007$)

Facility Size	Facility-level Compliance Cost[1]
	Average Cost
Category I	$37,600
Category II	$58,400
Category III	$148,000
Category IV	$411,000

[1] See Appendix L in Volume II for details on the assumptions for arriving at these costs.

Source: SCS Engineers.

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Exhibit 6-52
Assumptions on Production Facility Characteristics

Cost Item		Category I	Category II	Category III	Category IV	
Labor Burden of Certifying an Existing SPCC Plan[1]	PE	6 hours	12 hours	24 hours	36 hours	
	Clerical Worker	0.5 hour	1 hour	2 hours	3 hours	
Number of Tank Batteries[2]		1	1	1	4	8
Number of Tanks per Tank Battery[3]	Minimum Capacity	(1) 1,000-gallon tank	(1) 1,000-gallon tank and (1) 10,000-gallon tank	(3) 20,000-gallon tanks	(3) 100,000-gallon tanks	(3) 50,000-gallon tanks
	Maximum Capacity	(1) 10,000-gallon tank	(1) 1,000-gallon tank and (3) 10,000-gallon tanks	(3) 100,000-gallon tanks		
Total Tank Capacity[4]		1,000 – 10,000 gallons	11,000 – 31,000 gallons	60,000 – 300,000 gallons	1,200,000 gallons	

1 Assumes that facility uses in-house labor when a Professional Engineer is not required. A production facility will incur labor costs roughly proportional to the size of the facility. The labor hours needed to complete a task at a Category II, III, and IV size facility are assumed to be 2, 4, and 6 times the labor hours needed at a Category I size facility, respectively. Assumptions provided by SCS Engineers.

2 Estimates provided by SCS Engineers; assumption used to develop universe estimates.

3 Estimates provided by SCS Engineers.

4 Estimates provided by SCS Engineers, an engineering firm.

It is important to note that since certain SPCC requirements may be similar in nature to those imposed by state regulations and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. Since regulations vary widely across states and industries, there is no single adjustment factor that could be developed to address this issue for the universe of regulated facilities. However, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. As a result, the estimated compliance costs are likely to present a significant overestimate of the costs attributed to the SPCC rule. For details of the state overlap analysis, refer to Section 5.4 of this report.

About 75 percent of facilities face an additional cost of amending and certifying the Plans after the operations are stabilized (see Exhibit 6-53). While a facility owner/operator must have the Plan certified by a PE, the cost of amending the Plan depends on whether a facility uses in-house labor or hires outside Professional Engineers, where the latter is more expensive. On the one hand, a small facility is more likely to hire outside engineers because it may not have the in-house expertise to comply with the SPCC requirements. On the other hand, a small facility may not have the resources to hire outside engineers and may be in a better position to use in-house labor because the owner may be closely involved with all the operations. A similar two-sided argument can also be made for larger facilities. Therefore, EPA assumed that 50 percent of the facilities of all size categories use in-house labor and the remaining 50 percent use outside professional labor. The unit costs of amending and certifying the SPCC Plan also depend on

whether the technical amendment is minor or major. EPA calculated the cost savings for each facility using the average PE certification cost of a minor and major technical amendment.[114]

Exhibit 6-53
Annual Cost of Plan Amendment
for Production Facilities (2007$)

Facility Size	Facility-level Cost of Plan Amendment[1]
	Average Cost[3]
Category I	$1,830
Category II	$3,660
Category III	$7,320
Category IV	$11,000

1 Includes the cost of amending the Plan and the cost of having a PE certify the Plan. Numbers are rounded to the nearest ten.
2 Average of the cost for major and minor changes.
Source: SCS Engineers.

Based on the facility-level costs, EPA estimated that the baseline cost of compliance for oil production facilities is $563 million and $558 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-54).

[114] The PE cost estimates were based on the unit cost inventory developed with the help of SCS engineers, a PE firm.

Exhibit 6-54
Projected Annual Baseline Compliance Costs of 2002 SPCC Requirements for Production Facilities (2007$ Millions)

	Compliance Costs											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$518	$387	$558	$579	$602	$551	$752	$490	$562	$672	**$5,670**	**$567**
3% Discounted	$503	$365	$510	$514	$519	$462	$612	$386	$431	$500	**$4,800**	**$563**
7% Discounted	$484	$338	$455	$441	$429	$367	$469	$285	$306	$342	**$3,920**	**$558**

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Compliance Cost Savings

As a result of the final rule change, the main cost savings for a facility would result from not having to amend the Plan and have it certified by a PE after operations have stabilized. EPA assumed that there would be no cost savings related to Plan preparation and implementation because there would be no change in the cost in the first year. Facilities may find it economical to construct the containment structures at the time of construction, regardless of the implementation date.

The cost savings from this final amendment include the cost of amending the Plan and having the Plan certified by a PE. The Agency assumed that a production facility owner or operator would have a PE certify technical amendments to the facility's Plan once in the first six months of operation, for the changes made at the facility that materially affect its potential for a discharge. As discussed above, the unit costs of amending and certifying the SPCC Plan also depend on whether the technical amendment is minor or major. EPA calculated the cost savings for each facility using the average PE certification cost of a minor and major technical amendment.[115] The unit costs for amending and certifying the SPCC Plan are provided in Exhibit 6-55.

Exhibit 6-55
Annual Cost of Plan Amendment for Production Facilities (2007$)

Facility Size	Facility-level Cost of Plan Amendment[1]
	Average Cost[2]
Category I	$1,830
Category II	$3,660
Category III	$7,320
Category IV	$11,000

1 Includes the cost of amending the Plan and the cost of having a PE certify the Plan. Numbers are rounded to the nearest ten.
2 Average of the cost for major and minor changes.
Source: SCS Engineers.

The total cost savings from the final amendments were calculated by multiplying the facility-level cost by facility size category with the total number of new production facilities affected by this amendment in each facility category, as summarized in the equation below.

EPA determined that there was a certain degree of overlap between the relaxed requirements for production facilities introduced by the six-month delay amendment and the amendment for small production facilities with marginal wells. The six-month delay amendment allows facilities to delay Plan preparation and as a result, to avoid the associated PE certification of the amendments made to the Plan during the start-up period of the operation. The final amendment for small production facilities exempts owners and operators from the PE certification of the Plan and its amendments at any time of facility's operation. Therefore, both amendments allow facilities to avoid the PE certification of the SPCC Plan during the start-up period of the operation. As a result of this overlap, EPA accounted for the common cost savings in the

[115] The PE cost estimates were based on the unit cost inventory developed with the help of SCS engineers, a PE firm.

section for the six-month delay amendment and removed the double counting effect from the cost savings for the small production facilities.

EPA estimated that the final amendment to the SPCC rule would reduce compliance costs by $24.1 million and $23.8 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-56).

Calculation of Total Cost Savings

$$Total\ Cost\ Savings = \sum_i NFac_i * (NCostS_i) * Overlap_i$$

Where,

i = I, II, III, and IV are the facility size categories

$NFac_i$ = the projected number of new production facilities affected by size category (see Exhibit 6-50)

$NCostS_i$ = the annualized cost of amending and certifying SPCC (see Exhibit 6-55).

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22)

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Exhibit 6-56
Projected Annual Compliance Cost Savings from Final Amendment to SPCC Plan Preparation and Implementation (2007$ Millions)[1]

	Total Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$22.2	$16.6	$23.8	$24.7	$25.7	$23.6	$32.2	$20.9	$24.0	$28.7	**$242**	**$24.2**
3% Discounted	$21.5	$15.6	$21.8	$22.0	$22.2	$19.7	$26.2	$16.5	$18.4	$21.4	**$205**	**$24.1**
7% Discounted	$20.7	$14.5	$19.5	$18.9	$18.3	$15.7	$20.0	$12.2	$13.1	$14.6	**$167**	**$23.8**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.13.5.4 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

In addition, EPA considered an alternative option wherein owners and operators of new production facilities would be allowed one year after the start of operations to prepare and implement an SPCC Plan. However, EPA did not select this option because the majority of the facilities are likely to stabilize operations within the first six months of starting operations.

The Agency assumed that all new production facilities would be affected by the alternative to the final amendment to the extent that it delays the total cost of complying with the SPCC requirements by one year. In the first year, the facilities would save the annual cost of complying with SPCC requirements. Facilities would also be affected because their owners/operators would not have to certify any technical amendments made within the first year of operation. EPA assumed that only 75 percent of the new facilities would save from the cost of amending and certifying technical changes to the SPCC Plan. As discussed above, the remaining 25 percent of the facility owner/operators are expected to be correct in their original predictions of the oil well's flow and would therefore not need to make changes to their Plan.[116]

Exhibit 6-57 presents the projected number of new production facilities that would be affected by this alternative to the final amendment from 2010 through 2019. EPA projected the number of new production facilities over the 10-year analysis period using the estimated number of SPCC-regulated production facilities and industry-specific growth rates.[117]

Exhibit 6-57
Projected Total Number of New Production Facilities

Oil Production Industry	Number of New Facilities Affected by the Alternative Option										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Category I	1,080	804	1,160	1,200	1,250	1,140	1,560	1,020	1,170	1,400	**1,180**
Category II	5,800	4,330	6,240	6,480	6,730	6,170	8,420	5,480	6,290	7,520	**6,350**
Category III	1,520	1,140	1,640	1,700	1,770	1,620	2,210	1,440	1,650	1,980	**1,670**
Category IV	15	11	16	17	17	16	22	14	16	19	**16**
Total	**8,420**	**6,290**	**9,050**	**9,400**	**9,770**	**8,950**	**12,200**	**7,950**	**9,120**	**10,900**	**9,210**

6.13.5.5 Estimated Cost Savings

To arrive at the cost savings associated with this approach, EPA shifted all costs incurred by first-year facilities to the year after each facility comes into operation. Thus, the industry could experience increased costs in certain years, if more facilities had come into operation the preceding year. Exhibit 6-58 provides the baseline cost for each year, cost after implementation of the proposed amendment, and cost savings for each year of the analysis.

[116] Personal communication with Richard Franklin of Region 6, February 2007.

[117] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

EPA estimated that the considered amendment to the 2002 SPCC final rule would reduce compliance costs by $106 million and $114 million per year, discounted at 3 percent and 7 percent respectively (see Exhibit 6-59). However, EPA did not select this option.

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Exhibit 6-58
Projected Annual Compliance Cost Savings under the Alternative Option for Plan Preparation and Implementation
(2007$ Millions)

	Compliance Cost Savings										
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10-Year Present Value**
Baseline Cost											
Category I	$36.6	$27.4	$39.4	$40.9	$42.5	$39.0	$53.2	$34.6	$39.7	$47.5	**$401**
Category II	$307	$229	$330	$342	$356	$326	$445	$290	$332	$397	**$3,350**
Category III	$171	$128	$184	$191	$198	$182	$248	$162	$185	$222	**$1,870**
Category IV	$4.09	$3.05	$4.40	$4.56	$4.74	$4.35	$5.93	$3.86	$4.43	$5.30	**$44.7**
Total	**$518**	**$387**	**$558**	**$579**	**$602**	**$551**	**$752**	**$490**	**$562**	**$672**	**$5,670**
Cost after Proposed Amendment											
Category I	$0.0	$34.7	$25.9	$37.3	$38.7	$40.2	$36.9	$50.3	$32.7	$37.6	**$334**
Category II	$0.0	$285	$213	$307	$319	$331	$303	$414	$270	$309	**$2,750**
Category III	$0.0	$160	$119	$172	$178	$186	$170	$232	$151	$173	**$1,540**
Category IV	$0.0	$3.92	$2.93	$4.22	$4.38	$4.55	$4.17	$5.70	$3.71	$4.25	**$37.8**
Total	**$0**	**$484**	**$361**	**$520**	**$540**	**$561**	**$514**	**$702**	**$457**	**$524**	**$4,670**
Cost Savings											
Category I	$36.6	-$7.29	$13.5	$3.61	$3.82	-$1.27	$16.3	-$15.7	$6.97	$9.90	**$66.5**
Category II	$307	-$56.3	$117	$35.3	$37.2	-$5.1	$142	-$124.6	$62.8	$88.0	**$602**
Category III	$171	-$32.1	$65	$19.0	$20.0	-$3.7	$78	-$70.5	$34.4	$48.4	**$329**
Category IV	$4.09	-$0.870	$1.47	$0.343	$0.364	-$0.207	$1.76	-$1.83	$0.725	$1.045	**$6.88**
Total	**$518**	**-$97**	**$196**	**$58.3**	**$61.4**	**-$10.3**	**$238**	**-$213**	**$105**	**$147**	**$1,000**

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Exhibit 6-59
Projected Annual Compliance Cost Savings under the Alternative Option for Plan Preparation and Implementation (2007$ Millions)

	Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10-Year Present Value**	**Annualized**
Not Discounted	$518	-$97	$196	$58.3	$61.4	-$10.3	$238	-$213	$105	$147	**$1,010**	**$100**
3% Discounted	$503	-$91	$179	$51.8	$53.0	-$8.6	$193	-$168	$80.4	$110	**$903**	**$106**
7% Discounted	$484	-$84	$160	$44.4	$43.8	-$6.8	$148	-$124	$57.1	$74.9	**$798**	**$114**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.13.6 Flowlines and Intra-facility Gathering Lines

6.13.6.1 Background

EPA is finalizing a conditional exemption from secondary containment requirements under the SPCC rule for flowlines and intra-facility gathering lines. That is, in lieu of general secondary containment, an owner or operator may opt to prepare a contingency plan and written commitment of manpower, equipment, and materials. Additionally, EPA is finalizing specific requirements for a flowlines and intra-facility gathering lines maintenance program. EPA is also exempting intra-facility gathering lines that are subject to the regulatory requirements at 49 CFR parts 192 or 195 from the SPCC requirements.

The current SPCC rule requires secondary containment for all areas of a facility where there is a potential for a discharge, as described in §112.1(b). This requirement applies to flowlines and intra-facility gathering lines. However, if secondary containment is determined impracticable, facility owners/operators have the option to explain why it is not practicable and provide a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of discharged oil that may be harmful. Owners/operators are also required to provide an oil spill contingency plan prepared in accordance with 40 CFR part 109.

EPA recognizes that gathering lines are often outside of the Agency's jurisdiction because they "transport" oil outside of an oil production facility. Based on a 1971 Memorandum of Understanding (MOU) with the Department of Transportation (DOT), EPA has jurisdiction only over non-transportation-related facilities, which includes pipelines that transport oil within a facility. Any pipeline, including a gathering line, that transports oil between facilities or from a facility to a vessel, is considered transportation-related and is therefore outside the jurisdiction of EPA and not subject to the SPCC rule. However, the definition of "facility" as it applies to the SPCC rule is flexible, and some gathering lines may be within the boundaries of a non-transportation-related facility.

EPA assumed that all facilities currently determine impracticability because of the prohibitive cost of secondary containment around flowlines and intra-facility gathering lines. As a result of the final amendment, facility owners/operators would no longer need to explain why secondary containment is not practicable, but they would still need to prepare an oil spill contingency plan. Intra-facility gathering lines are those lines that connect tank batteries located inside the facility. Based on information from EPA regions, it is likely that each production facility has one tank battery. However, the definition of "facility" is flexible, and a facility owner/operator is able to include any number of tank batteries—and the intra-facility gathering lines that connect them—within the boundaries of the facility. Given the uncertainty of how frequently facility owners/operators would aggregate tank batteries, for the purposes of this analysis, EPA assumed one tank battery per production facility. This implies that the final rule clarifications would not result in any impact on intra-facility gathering lines and would only affect facility's flowlines.

EPA recognizes that a contingency plan provides environmental protection in response to a discharge, but in order to implement such a plan, a discharge detection mechanism is necessary. Furthermore, EPA believes that with the elimination of the requirement for secondary containment, a strong program of flowline or intra-facility gathering line maintenance would provide additional preventative measures for these pipelines and increase discharge detection ability. Therefore, EPA is adding specificity to the existing flowline maintenance program requirements and clarifying that the requirement applies to intra-facility gathering lines as well as flowlines at a production facility. The maintenance program provision would require that facilities visually inspect these pipelines, remove discharges, and take corrective action. This provision would continue to be subject to the "environmental equivalence" provision at §112.7(a)(2), meaning that a facility owner/operator can substitute alternative measures if he or she demonstrates that the alternate measures would achieve equivalent environmental protection.

To clarify the scope of the SPCC rule's applicability to gathering lines, the Agency is finalizing an amendment that would exempt the few "intra-facility" gathering lines that are subject to both EPA and DOT regulatory requirements. Some intra-facility gathering lines may be regulated by DOT because DOT may limit the boundary of a facility to the central tank battery, thereby including under regulation intra-facility gathering lines that are also regulated by EPA. EPA's exemption of DOT-regulated gathering lines from SPCC regulation is not likely to have any impact on compliance costs, because the gathering lines subject to DOT's authority under the "technical requirements" of 49 CFR parts 192 and 195 would be subject to similar requirements as under the SPCC rule.

6.13.6.2 Universe of Affected Facilities

Since EPA assumed that all facilities currently determine impracticability of secondary containment around flowlines and develop an oil spill contingency plan instead, existing facilities would already have a contingency plan in place. Therefore, only new production facilities would be affected by the final amendment. Exhibit 6-60 presents the projected number of new production facilities from 2010 through 2019. The projected average annual number of new production facilities is 9,210. The Agency projected the number of new production facilities over the 10-year analysis period using the estimated number of SPCC-regulated production facilities and industry-specific growth rates.[118]

Exhibit 6-60
Projected Number of New Production Facilities with Flowlines/Intra-Facility Gathering Lines[1]

Oil Production Industry	Number of New Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Category I	1,080	804	1,160	1,200	1,250	1,140	1,560	1,020	1,170	1,400	**1,180**
Category II	5,800	4,330	6,240	6,480	6,730	6,170	8,420	5,480	6,290	7,520	**6,350**
Category III	1,520	1,140	1,640	1,700	1,770	1,620	2,210	1,440	1,650	1,980	**1,670**

[118] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

Category IV	15	11	16	17	17	16	22	14	16	19	**16**
Total	**8,420**	**6,290**	**9,050**	**9,400**	**9,770**	**8,950**	**12,200**	**7,950**	**9,120**	**10,900**	**9,210**

[1] This exhibit is identical to Exhibit 6-63 – represents the total number of new production facilities.

6.13.6.3 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA calculated the baseline compliance cost incurred by new production facilities for complying with the flowlines and intra-facility gathering lines secondary containment requirements. EPA assumed that, in the baseline, all the facilities with flowlines or intra-facility gathering lines would choose impracticability determination, because it is less expensive than installing secondary containment. Therefore, the baseline cost of compliance was calculated by multiplying the projected number of new production facilities and the corresponding cost of impracticability determination (Exhibit 6-61).

Exhibit 6-61
Cost of Demonstrating Environmental Equivalence (2007$)[1]

Facility Size	Facility-level Cost of Demonstrating Environmental Equivalence
	Production Facilities
Category I	$154
Category II	$307
Category III	$615
Category IV	$922

[1] Cost estimates based on labor burden for explaining why secondary containment is impracticable. Cost estimates do not include adjustment for state overlap.

Source: SCS Engineers.

EPA estimated that the baseline cost of compliance with the flowlines and the intra-facility gathering lines secondary containment requirement is $2.69 million and $2.67 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-62).

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Exhibit 6-62
Projected Annual Cost of Compliance with Secondary Containment Requirements for Flowlines and Intra-Facility Gathering Lines (2007$ Millions)

	Compliance Costs											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$2.48	$1.85	$2.67	$2.77	$2.88	$2.64	$3.60	$2.34	$2.69	$3.22	**$27.1**	**$2.71**
3% Discounted	$2.41	$1.75	$2.44	$2.46	$2.48	$2.21	$2.93	$1.85	$2.06	$2.39	**$23.0**	**$2.69**
7% Discounted	$2.32	$1.62	$2.18	$2.11	$2.05	$1.76	$2.24	$1.36	$1.46	$1.63	**$18.7**	**$2.67**

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Compliance Cost Savings

EPA assumed that, in the baseline, all the facilities with flowlines would choose impracticability determination, because it is less expensive than installing secondary containment. Therefore, as a result of the final amendment, facility owners/operators would not benefit from cost savings on secondary containment. Instead, owners/operators would save from not having to determine impracticability. In order to determine impracticability, the current SPCC rule requires the facility owner or operator to (1) explain why it is impracticable, (2) develop a contingency plan, and (3) have a written commitment of resources in case of a discharge. Since the final amendment requires that a facility have a contingency plan and written commitment of resources, the facility would only save the cost of not needing to explain why secondary containment is impracticable.

In addition to exempting secondary containment for flowlines, the final amendments would provide prescriptive requirements for a flowline and gathering line maintenance program. The 1973 SPCC rule had prescriptive requirements for the flowline maintenance program, and the 2002 rule only required that the facility owners and operators have a maintenance program without a prescriptive requirement. However, a PE had to certify the maintenance program.

EPA expects that the maintenance program facility owners and operators currently have in place incorporates most of the prescriptive requirements finalized in this amendment. Since the current SPCC rule requires a maintenance program, EPA assumed that production facilities would choose the lower-cost option and would demonstrate that their program is environmentally equivalent to the prescriptive requirements of the final amendment, rather than adopt the new requirements. Thus, the facility owners and operators would incur a cost increase only for having to demonstrate environmental equivalence, as a result of the final amendments.

The Agency expects that the cost of demonstrating in the Plan how the current maintenance program is environmentally equivalent to the prescriptive requirements is likely to be similar to the cost of explaining why secondary containment is impracticable for flowlines and gathering lines. Therefore, on balance, facilities would not face any significant cost change because of this final amendment. It is important to note that some facilities may have maintenance programs that are more stringent than the prescriptive requirements. In those cases, facility owners and operators would go beyond the prescriptive measures outlined in the final amendment. In conclusion, the final amendment offers clarity on what constitutes a flowline maintenance program, while allowing flexibility to deviate if a PE certifies an alternative measure that is environmentally equivalent.

6.13.6.4 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on facilities.

In addition, the Agency considered an alternative option to allow the facilities to choose between a flowline maintenance program with a contingency plan (as in the final amendments) and providing a method of secondary containment for flowlines and intra-facility gathering lines. However, EPA did not select this option. Since EPA assumed that all facilities would determine

impracticability under the current SPCC requirements, no facilities would choose to provide secondary containment. Therefore, the cost savings from this alternative option would be the same as those from the final amendment.

6.13.7 Flow-through Process Vessels

Flow-through process vessels at a production facility typically include equipment such as horizontal or vertical separation vessels (e.g., free-water knockout, gun-barrel, heater-treater) that are used to separate the well fluid into its marketable or waste fractions (oil, gas, wastewater, and solids), and to treat the crude oil as needed for further storage and shipping. Under the current SPCC requirements, process vessels are required to have secondary containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation (§112.9(c)(2)). EPA is modifying the requirements at §112.9(c) to provide an alternative to the sized secondary containment requirements for flow-through process vessels at oil production facilities. This amendment removes the requirement to provide sized secondary containment for flow-through process vessels at oil production facilities without making an impracticability determination, and allows the facility owner or operator the option to comply with the alternate requirements in §112.9(c)(5) instead. However, because this equipment at a production facility typically operates unattended, EPA is also amending the rule to require the inspection of process vessel components including ancillary equipment, prompt removal of any oil accumulations, and corrective action should a discharge occur.

6.13.7.1 Universe of Affected Facilities

Because the Agency assumed full compliance with the current SPCC rule requirements, existing facilities would not be affected by this amendment; only new production facilities would be affected. The amendment has an eligibility clause, requiring facilities that have a single oil discharge to navigable waters or adjoining shorelines exceeding 1,000 gallons or two discharges to navigable waters or adjoining shorelines exceeding 42 gallons within a 12-month period to revert back to the sized containment requirement within six months of the discharge date. However, the discharge history from the process vessels suggests that the percentage of such facilities would be few. The Agency analyzed the National Response Center (NRC) data for the period of 2000 through 2005 and found only 120 discharge cases originating from process vessels, which is equivalent to approximately 20 discharges a year.[119] Even assuming that these discharges originated from 20 individual facilities and exceeded 1,000 gallons each, it would result in an insignificant percentage of the total number of oil production facilities (215,000). The final amendment also includes measures that are likely to further reduce the threat of an oil discharge from these vessels. Therefore, the Agency assumed that all new facilities would be exempt from the sized secondary containment requirements.

Exhibit 6-63 presents the projected number of new production facilities from 2010 through 2019. The projected average annual number of new production facilities is estimated to be 9,210. EPA

[119] National Response Center, June 2006. Available at: http://www.nrc.uscg.mil/download.html.

projected the number of new production facilities over the 10-year analysis period using the estimated number of SPCC-regulated production facilities and industry-specific growth rates.[120]

Exhibit 6-63
Projected Number of New Production Facilities[1]

Oil Production Industry	Number of New Facilities Affected by the Amendment										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
Category I	1,080	804	1,160	1,200	1,250	1,140	1,560	1,020	1,170	1,400	**1,180**
Category II	5,800	4,330	6,240	6,480	6,730	6,170	8,420	5,480	6,290	7,520	**6,350**
Category III	1,520	1,140	1,640	1,700	1,770	1,620	2,210	1,440	1,650	1,980	**1,670**
Category IV	15	11	16	17	17	16	22	14	16	19	**16**
Total	**8,420**	**6,290**	**9,050**	**9,400**	**9,770**	**8,950**	**12,200**	**7,950**	**9,120**	**10,900**	**9,210**

[1] This exhibit is identical to Exhibit 6-60 – represents the total number of new production facilities.

6.13.7.2 Baseline Compliance Cost and Cost Savings

Baseline Compliance Cost

EPA calculated the baseline compliance cost incurred by new production facilities for complying with the secondary containment requirements for flow-through process vessels. EPA assumed that all facilities would locate their separation and treatment containers within the tank battery with the possible exception of the heater-treater; EPA's site visits and the review of several SPCC Plans suggest that some facilities have at least one heater-treater outside the tank battery. Therefore, EPA assumed that the baseline cost of compliance would be the cost of providing sized secondary containment around one heater-treater outside the tank battery. The Agency estimated that the cost of sized containment (earthen berm) around a heater-treater is $4,000 for all size categories.[121]

The total baseline cost of compliance was calculated by multiplying this facility-level cost with the total number of production facilities affected by this amendment.

EPA estimated that the baseline cost of compliance with the flow-through process vessels requirements is $36.6 million and $36.2 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-64).

[120] For the methodology used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

[121] Personal communication with Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

Exhibit 6-64
Annual Baseline Compliance Cost of Secondary Containment at Flow-through Process Vessels Requirements
(2007$ Millions)

	Compliance Costs											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$33.7	$25.2	$36.2	$37.6	$39.1	$35.8	$48.9	$31.8	$36.5	$43.6	**$368**	**$36.8**
3% Discounted	$32.7	$23.7	$33.1	$33.4	$33.7	$30.0	$39.7	$25.1	$28.0	$32.5	**$312**	**$36.6**
7% Discounted	$31.5	$22.0	$29.6	$28.7	$27.9	$23.9	$30.4	$18.5	$19.9	$22.2	**$254**	**$36.2**

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Compliance Cost Saving

EPA assumed that all new production facilities would save on the cost of sized secondary containment, but would still incur the cost of general secondary containment. While providing relief from sized secondary containment, EPA is requiring that facilities inspect components, remove oil accumulations, and take corrective action. Under the current SPCC rule, facilities are already required to periodically inspect containers under §112.9(c)(3). The Agency believes that facilities would remove oil accumulations and take corrective action as part of their normal maintenance operations, and expects no effect on cost because of these additional requirements. Therefore, the cost savings to the facility would be the difference in the cost of sized secondary containment and general secondary containment.

Given the current SPCC requirements, facilities would save the cost of sized secondary containment only if the separation process vessels are located outside of the tank battery, which generally has one secondary containment dike or berm around all of the containers. If the vessels are inside the tank battery, the sized secondary containment that is required for oil stock tanks would likely provide sufficient containment for the process vessels. EPA assumed that all facilities would locate their separation and treatment containers within the tank battery with the possible exception of the heater-treater; EPA's site visits and the review of several SPCC Plans suggest that some facilities have at least one heater-treater outside of the tank battery. Therefore, the amendments present no compliance cost savings for secondary containment of separation process vessels.

The Agency assumed that the cost of general secondary containment is approximately 80 percent of the cost of sized secondary containment. This is based on the fact that, unlike sized secondary containment, which must be designed to hold the capacity of the largest container, general secondary containment should be sized only to contain the most likely discharge (which may be caused by overfill, etc.). The Agency estimated that the cost of sized secondary containment (earthen berm) around a heater-treater is $4,000 for all size categories.[122] The affected facilities would save the difference in cost between sized and general secondary containment (i.e., 20 percent of the total cost for sized secondary containment). Thus, the per-facility cost savings were estimated at $800.

The total cost savings from the final amendments were calculated by multiplying the facility-level cost with the total number of production facilities affected by this amendment, as summarized in the equation below.

Using the equation below, EPA estimated that the final amendment to exempt the facilities from sized secondary containment for flow-through process vessels would reduce compliance costs by $7.31 million and $7.24 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-65).

[122] Personal communication with Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

Calculation of Total Cost Savings

$$Total\ Cost\ Savings = \sum_{ij} NFac_i * NCostSaving_i * Overlap_i$$

where, i = I, II, III, and IV are the size categories.

$NFac_i$ = the projected number of production facilities in size category i (see Exhibit 6-63).

$NCostSaving_i$ = the per-facility cost savings for size category i (see Section 6.13.7.2).

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category i (see Exhibit 5-22).

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Exhibit 6-65
Projected Annual Compliance Cost Savings from Final Amendment to Flow-through Process Vessels Requirements
(2007$ Millions)[1]

	Compliance Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$6.73	$5.03	$7.24	$7.52	$7.81	$7.16	$9.77	$6.36	$7.30	$8.73	**$73.7**	**$7.37**
3% Discounted	$6.54	$4.74	$6.63	$6.68	$6.74	$6.00	$7.95	$5.02	$5.59	$6.49	**$62.4**	**$7.31**
7% Discounted	$6.29	$4.39	$5.91	$5.73	$5.57	$4.77	$6.09	$3.70	$3.97	$4.44	**$50.9**	**$7.24**

[1] See Appendix K in Volume II for more details on the calculation of cost savings.

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6.13.7.3 Alternative Options Considered

The Agency considered the alternative option of no action, which would have no cost impact on the facilities.

6.13.8 Marginal Oil Production Facilities

Some stakeholders, in their public comments on the October 2007 proposed SPCC amendments, expressed concern about the regulation of small oil production facilities under the SPCC rule, suggesting that the costs of the SPCC requirements are disproportionate to the threat that these small production facilities pose to the environment. EPA believes that discharges from small oil production facilities can pose a threat of an oil discharge to navigable waters or adjoining shorelines and that these facilities should remain subject to the SPCC rule. However, to address stakeholder concerns, EPA requested comment on several regulatory approaches in the 2007 SPCC proposed rule.

Under the EPA approach, an oil production facility would be eligible as a qualified facility if it meets the following criteria: (1) the oil production facility must have no injection wells at the facility and no more than four producing wells per single tank battery, or has one or more injection wells at the facility and no more than two producing wells per single tank battery; (2) all wells must be marginal wells, each producing 10 barrels or less of crude oil per day – that is, a tank battery at an oil production facility could not include any non-marginal wells under this option; and (3) the facility must not have had a single discharge as described in §112.1(b) exceeding 1,000 U.S. gallons or two discharges as described in §112.1(b) each exceeding 42 U.S. gallons within any 12-month period in the three years prior to Plan certification. A qualified oil production facility owner/operator would have the option to prepare a self-certified SPCC Plan rather than a Plan certified by a PE.

6.13.8.1 Universe of Affected Facilities

To assess the impact of this approach, EPA estimated the number of marginal well facilities that would have no injection wells at the facility and no more than four producing wells per single tank battery or would have one or more injection wells at the facility and no more than two producing wells per single tank battery. EPA did not have data readily available on the number of oil production facilities that have only marginal wells and on the number of such wells at each production facility. In order to estimate the number of production facilities consisting entirely of marginal wells, facility-level data on production rates are required. In oil-producing states, under state regulations, oil lease holders must report oil production rates to the state authority for each well and/or lease. This information is used by the states to estimate severance tax on oil production. Using this information, it would possible to estimate the average production per well for each lease, and potentially, the number of wells within each lease that produce above and below the marginal threshold. However, production data for most of the key states with some or many marginally producing wells are not readily available at the facility or individual well level. Instead, most states report oil production data for individual leases.

For the purposes of this analysis, EPA used one lease as an approximation of an oil production facility, as defined in the SPCC rule. Since multiple facilities could be located within the same lease, it is important to note that using a lease as a proxy of a facility is likely to introduce a downward bias in the estimate of the number of facilities affected by the EPA approach and consequently a downward bias in the cost savings resulting from the EPA approach.

The information gathered from the states and EPA regions suggests that the characteristics of a production facility differ widely across regions and even across states within regions. This suggests that the analysis should use region-specific estimates in order to arrive at the estimated number of affected facilities. Within each region, EPA used data on oil production for states that have the majority of the marginal wells in the region, and if data were not available for the state with the majority of marginal wells, EPA developed the estimates based on the states with available data. For example, EPA used the data for California to estimate the number of affected facilities in EPA Region 9 because California accounts for 99.9 percent of marginal wells in the region. The Agency used the most recent data available, for 2007.

As a result of this approach, EPA estimated the number of affected facilities in Regions 5, 6, 7, 8, and 9. The data from the Interstate Oil and Gas Compact Commission (IOGCC) on marginal wells and inputs from EPA regional staff both suggest that Regions 1, 2, 4, and 10 do not have significant number of marginal wells. Therefore, EPA estimated that facilities in this region would not be affected by the EPA approach. In Region 3, almost all marginal wells are located in Pennsylvania and West Virginia. Based on inputs from EPA regional staff, EPA estimated that in Pennsylvania all wells are marginal and that most oil production facilities with marginal wells have injection wells (which inject water or other fluids to enhance recovery).[123] As a result, EPA estimated that in 2007 a total of 79,848 oil production "facilities" had no injection wells and no more than four producing wells or had one or more injection wells and no more than two producing wells.

6.13.8.2 Distribution of Facilities by SPCC Size Category

EPA estimated the distribution of these facilities assuming the same size distribution as that for the entire universe of production facilities. It is important to note that the distribution of size categories is based on data for all types of facilities, not just marginal ones. As a result, the estimate of the size distribution would be skewed toward larger production facilities. This distribution is provided in Exhibit 6-66.

[123] "…If injection wells mean injection of water or other fluids to enhance recovery, then in PA [Pennsylvania] most oil production facilities with marginal wells will have injection wells." E-mail from Vincent Zenone, EPA Region 3, April 2008.

Exhibit 6-66
Distribution of Production Facilities across Size Categories[1]

Size Category	Capacity (Gallons)	Percentage of Facilities
Category I	1,320-10,000	13%
Category II	10,001-42,000	69%
Category III	42,001-1 million	18%
Category IV	>1mln	0.2%

[1] We assume that facilities of all storage capacities would be affected. Older facilities with larger containers on site are now producing at a lower rate and could be qualified for the small production facilities option (two marginal wells and no injection wells). While those facilities have smaller total storage volumes, they still have large shell capacities on site that would place them into Categories III and IV as well as Categories I and II.

Based on these data and industry-specific growth rates, EPA then projected the total number of affected new and existing production facilities over the 10-year analysis period (2010 through 2019) in each category size.[124] Exhibit 6-67 presents the projected number of new and existing production facilities that would be affected by this approach for marginal production facilities from 2010 through 2019. The projected average annual number of affected production facilities is 68,200. Note that facilities in size Category I do not incur any costs savings; they may already meet the criteria for qualified facilities finalized in December 2006 (71 FR 77266, December 26, 2006) since they contain less oil than the 10,000-gallon storage capacity threshold.

Exhibit 6-67
Projected Total Number of New and Existing Production Facilities Affected by the Final Option for Marginal Wells

	Number of Affected Facilities										10-Year Average
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10	
New Facilities											
Category I	0	0	0	0	0	0	0	0	0	0	**0**
Category II	2,522	1,864	2,713	2,816	2,927	2,669	3,684	2,356	2,713	3,260	**2,752**
Category III	663	490	713	740	769	702	968	619	713	857	**724**
Category IV	7	5	7	7	8	7	9	6	7	8	**7**
Total	**3,190**	**2,350**	**3,430**	**3,570**	**3,710**	**3,380**	**4,660**	**2,990**	**3,430**	**4,130**	**3,480**
Existing Facilities											
Category I	0	0	0	0	0	0	0	0	0	0	**0**
Category II	61,920	63,731	66,338	69,043	71,855	74,432	77,950	80,238	82,865	86,006	**73,438**
Category III	16,278	16,754	17,439	18,150	18,890	19,567	20,492	21,094	21,784	22,610	**19,306**
Category IV	160	164	171	178	185	192	201	207	214	222	**189**
Total	**78,400**	**80,700**	**83,900**	**87,400**	**91,000**	**94,200**	**98,600**	**102,000**	**105,000**	**109,000**	**92,900**
Total (New & Existing)	**81,500**	**83,000**	**87,300**	**90,900**	**94,700**	**97,600**	**103,000**	**104,000**	**108,000**	**113,000**	**96,400**

[124] For the method used to estimate the number of existing oil production facilities and industry-specific growth rates, see Chapter 4 and Appendix H.

6.13.8.3 Baseline Compliance Cost and Cost Savings

Oil production facilities that consist only of two marginal wells per tank battery with no injection wells would be able to take advantage of the relief offered by the final amendment, because they would meet the criteria for qualified facilities. That is, a small oil production facility owner/operator would have the option to prepare a self-certified SPCC Plan rather than a Plan certified by a PE.

Another potential impact of the regulatory relief approach is that facility operators with both marginal wells and non-marginal wells within the same facility could choose to redefine their facility. This could be done by splitting the facility in order to meet compliance requirements as long as the marginal and non-marginal wells are not in the same tank battery.

EPA calculated the cost savings for each facility size using the average PE certification cost for a new Plan, and for minor and major technical amendments.[125] Further, EPA assumed that a total of 13 percent of existing facilities amend their Plan each year due to a required 5-year review (10 percent of all facilities) and technical amendments to the facility (3 percent of all facilities). The average unit costs incurred for certifying a new and re-certifying an amended SPCC Plan are provided in Exhibit 6-68.

Exhibit 6-68
Annual Baseline Compliance Cost and Cost Savings from the Final Option for Marginal Wells (2007$)

Facility Size	Facility-level Cost and Cost Savings		
	Certifying the SPCC Plan (New Facilities Only)	Re-certifying the SPCC Plan after Amendments	Total Annual Cost/ Cost Savings
New Facilities			
Category I	$0	$0	**$0**
Category II	$1,500	$0	**$1,500**
Category III	$2,990	$0	**$2,990**
Category IV	$4,490	$0	**$4,490**
Existing Facilities			
Category I	$0	$0	**$0**
Category II	$0	$262	**$262**
Category III	$0	$523	**$523**
Category IV	$0	$785	**$785**

EPA assumed that a certain number of new and existing facilities with a total aboveground oil storage capacity of 10,000 gallons or less are already eligible to self-certify SPCC Plans as qualified facilities and receiving these savings. The average number of qualified facilities *before* this rule amendment is 32,600, over the analysis period 2010-2019. The average number of all oil production facilities over the analysis period is 255,066.

EPA estimated the total cost savings from the proposed approach by multiplying the facility-level cost by facility size category with the total number of new and existing production facilities

[125] The PE cost estimates are based on the unit cost inventory developed with the help of SCS Engineers, an engineering firm.

affected by this amendment in each size category. EPA determined that there was a certain degree of overlap between the relaxed requirements for production facilities introduced by the six-month delay amendment and the amendment for small production facilities. The six-month delay amendment allows facilities to delay Plan preparation and as a result, to avoid the associated PE certification of the amendments made to the Plan during the start-up period of the operation. The final amendment for small production facilities exempts owners and operators from the PE certification of the Plan and its amendments at any time of facility's operation. Therefore, both amendments allow facilities to avoid the PE certification of the SPCC Plan during the start-up period of the operation. As a result of this overlap, EPA accounted for the common cost savings in the section for the six-month delay amendment and removed the double counting effect from the cost savings for the small production facilities.

Calculation of Total Cost Savings

Total Cost Savings = *NFac * (NCost Saving Qualified)*Overlap*

where,

NFac = the projected number of affected facilities (see Exhibit 6-67).

NCost Saving Qualified = Facility-level cost savings for affected qualified facilities (see Exhibit 6-68).

Overlap = 1 - estimated percentage reduction in total burden due to state overlap for affected facilities (see Exhibit 5-22).

Using the equation above, EPA estimated that the final option for small production facilities with marginal wells would reduce compliance costs by approximately $30.2 million and $29.9 million per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-69).

Exhibit 6-69
Projected Annual Total Compliance Cost Savings for the EPA Approach for Marginal Oil Production Facilities (2007$ Millions)

	Total Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**10- Year Present Value**	**Annualized**
Not Discounted	$26.1	$25.5	$28.0	$29.1	$30.3	$30.7	$33.9	$32.1	$33.7	$35.8	**$305**	**$30.5**
3% Discounted	$25.4	$24.0	$25.6	$25.9	$26.1	$25.7	$27.5	$25.3	$25.8	$26.6	**$258**	**$30.2**
7% Discounted	$24.4	$22.2	$22.9	$22.2	$21.6	$20.4	$21.1	$18.7	$18.3	$18.2	**$210**	**$29.9**

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6.13.9 Produced Water Storage Containers

Some stakeholders, in their public comments to the October 2007 proposed SPCC amendments, expressed concern about the regulation of produced water containers, suggesting that the costs of the SPCC requirements are disproportionate to the oil discharge threat that these containers pose to the environment. EPA believes that discharges from produced water containers can pose a threat of an oil discharge to navigable waters or adjoining shorelines.

While assessing opportunities to clarify, tailor, and streamline the SPCC requirements, EPA considered whether there are regulatory approaches to implement CWA Section 311(j)(1)(C) for produced water containers that would be more appropriate to the production sector than the existing SPCC requirements.

Therefore, EPA is exempting produced water containers and any associated piping and appurtenances downstream of the container at oil production facilities from the requirements of the SPCC rule when a PE certifies, as part of the SPCC Plan, that no discharge from the produced water container and any associated piping and appurtenances downstream of the container, including a complete loss of the capacity of the container, could cause a discharge in quantities that may be harmful as described in 40 CFR part 110. Additionally, the owner or operator must verify and document on an annual basis that the produced water characteristics in the container, piping and appurtenances, procedures, or maintenance required to meet the standards of Part 110 that formed the basis for the PE certification are maintained.

Furthermore, for those produced water containers that are not exempt, the facility owner/operator has the option to apply general secondary containment requirements and conduct visual inspection, maintenance and corrective action, in lieu of sized secondary containment, when a PE establishes and certifies a practice for each produced water container that is designed to remove the free-phase oil that accumulates on the surface of the produced water. The SPCC Plan must include a description of the free-phase oil separation and removal procedure or process, the frequency it is implemented or operated, the amount of free-phase oil expected to be maintained inside the container, and a description of the adequacy of the general secondary containment approach for the produced water container, including the anticipated typical failure mode and the method, design, and capacity for general secondary containment. Additionally, the owner or operator must keep records of the implementation of these procedures in accordance with §112.7(e).

6.13.9.1 Model Production Facilities and Storage Capacity of Produced Water Containers

EPA developed a model production facility, based on SPCC Plans received from EPA Regional offices[126] and research conducted for the Production Sector Issue Paper.[127] For example, the model facility (in Category II) has the following storage capacities: (1) one produced water tank

[126] A sample set of SPCC Plans were obtained from EPA Regions in December 2006-January 2007. These sets of SPCC Plans may not be statistically representative of all production facilities nation-wide.

[127] U.S. Environmental Protection Agency. "Considerations for the Regulation of Onshore Oil Exploration and Production Facilities under the Spill Prevention, Control, and Countermeasure Regulation (40 CFR Part 112)" 2007.

(21,000 gallons), (2) 2 stock tanks (16,800 gallons each), and (3) one heater-treated (2,310 gallons). Exhibit 6-70 provides more detailed information.

Since storage capacities vary significantly across production facilities of different sizes and are uncertain to some extent, aggregate volumes of stock tanks and produced water containers may vary widely. Research conducted for the Production Sector Issue Paper[128] and inputs from EPA regional offices provides the following further points for this analysis.

- Grouping stock tanks and a produced water container in one tank battery is a common engineering practice.[129] Therefore, EPA assumed that a typical production facility has stock tanks and a produced water container located in one tank battery. An important caveat of this assumption is that as a production facility ages, more produced water is generated, which could require a larger produced water container. In that case, a facility owner/operator may decide to move the produced water container outside of the tank battery.
- Although some SPCC Plans show that multiple tank batteries could be included in one Plan, EPA assumes that one SPCC Plan covers one tank battery. For this analysis, the assumption of one tank battery per facility implies that there is one produced water container per facility. However, as a limitation to this analysis, EPA notes that facilities with multiple tank batteries could have more than one produced water container on site.

Exhibit 6-70 provides further information about the distribution of produced water and other containers storing oil and oil-related substances.

Exhibit 6-70
Oil Storage Containers at a Typical Oil Production Facility in Size Category II

Oil Storage Containers	Capacity (Gallons) (Average, Range)	Percentage of Total (Average, Range)
Produced Water Container (1)	21,000, (17,000- 23,000)	37%, (30%-40%)[1]
Stock Tanks (2)	33,600, (30,000 – 35,000)	59%, (52%-61%)
Heater-Treater (1)	2,310, (1,700-2500)	4%, (3%-4%)
Total	**57,000, (49,000- 61,000)**	**100%**

[1] This percentage could vary depending on oil well productivity. Some Regions have higher fractions for produced water. For example, from personal communication with Vincent Zenone, Region 3: "70% of the storage capacity for any of the size-categorized facilities would be required for produced water in PA. WV would have a similar percent of recovered produced water as a function of oil production."

Source: A set of SPCC Plans obtained from EPA Regions in December 2006-January 2007

6.13.9.2 Universe of Affected Facilities

The universe of facilities affected by this rule amendment consists of the two groups of production facilities:

[128] U.S. Environmental Protection Agency. "Considerations for the Regulation of Onshore Oil Exploration and Production Facilities under the Spill Prevention, Control, and Countermeasure Regulation (40 CFR Part 112)" 2007.

[129] Personal communication with Vincent Zenone, Region 3.

1. Facilities with Exempt Produced Water Containers (PE certifies that a discharge of the entire contents of the produced water container, piping and appurtenances into navigable waters or adjoining shorelines would not be harmful as described in 40 CFR part 110).

2. Facilities with Non-Exempt Produced Water Containers.

Consistent with the assumption of full compliance with the SPCC requirements, EPA expects that *existing* production facilities would have already constructed the sized secondary containment and would not be affected by this amendment. Further, EPA expects that the following factors could be important determinants of the facilities with exempt produced water containers:

- Facilities with high treatment technologies would qualify - those technologies provide the level of water treatment that would allow facilities to meet NPDES discharge requirements.
- Facilities further away from navigable waters or adjoining shorelines.
- The PE may, at his/her option, want additional site-specific data to identify the amount of oil within the produced water container, piping and appurtenances in order to make a judgment on the expectation that a discharge of the entire contents of the container would not cause harm as described in 40 CFR part 110. Effort to acquire such data is expected to be small; in most instances, EPA expects the characteristics of the produced water container, piping and appurtenances to be well known by the facility owner or operator.
- The characteristics of the produced water in the container may fluctuate depending on site-specific process features and conditions. The PE will need to consider this variability and reflect it in the Plan.
- Certain facilities may not be able to take advantage of this amendment
    - Category 1 facilities that are qualified facilities (with the total storage capacity of 10,000 gallons or less): those Tier II qualified facilities would not be able to benefit from the produced water container exemption unless a hybrid Plan is developed in which a PE certifies the exemption of the produced water container and identifies the characteristics of the produced water container in the Plan.
    - Category 2 facilities with smaller capacities: those facilities would not be able to become Tier I qualified facilities (less than 10,000 gallons total storage capacity and no tank greater than 5,000 gallons). The final amendment rules out this possibility, since certification means that facility owners/operators cannot use the SPCC Plan template or self-certification unless they develop a Tier II hybrid Plan.

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6.13.9.3 Baseline Compliance Cost and Cost Savings

Cost Savings per Facility

This section provides the per-facility cost savings for facilities with exempt produced water containers, piping and appurtenances and facilities with non-exempt produced water containers, piping and appurtenances. Since EPA did not have adequate data to identify facility with exempt and non-exempt produced water containers, EPA did not estimate the total cost savings from this amendment.

A potential effect of this exemption for produced water containers, piping and appurtenances would be reduced cost of providing secondary containment for a produced water container. EPA determined that it is a common engineering practice to co-locate stock tanks and a produced water container in one tank battery and provide sized secondary containment that has the capacity of the largest single oil container and sufficient freeboard to contain precipitation. [130] When designing a *sized* secondary containment structure for the tank battery, new oil production facility owners/operators would use a stock tank (approximately 16,800 gallons for the model production facility) as the largest tank and as a basis for sizing secondary containment (as opposed to using the produced water container of 21,000 gallons).

Given the final amendment, while facilities with exempt produced water containers, piping and appurtenances would not need to provide any secondary containment for the produced water container, facilities with non-exempt produced water containers would still, at a minimum, need to provide general secondary containment for the produced water container when a PE certifies the alternative option for establishing a procedure for each produced water container that is designed to separate the free-phase oil that accumulates on the surface of the produced water along with additional measures in lieu of sized secondary containment. Since at a typical facility a produced water container is located within the same tank battery as the stock tanks, a facility owner/operator would continue to provide sized secondary containment around the tank battery. Unless the owner/operator of the facility chooses to maintain sized secondary containment for the produced water container, the effect of the final amendment on facility owner/operators of facilities with both exempt and non-exempt produced water containers would be the same - they would construct a lower height wall around the tank battery. For the facilities with exempt produced water containers, piping and appurtenances the lower size secondary containment structure would provide required sized secondary containment for stock and other tanks within the battery. For the facilities with non-exempt produced water containers, the lower size secondary containment structure would provide required sized containment for stock and other tanks within the battery and general containment for the produced water container.

The overall savings from constructing a lower height wall around the tank battery would be the reduction in the construction cost associated with building a sized secondary containment based

[130] Personal communication with Vincent Zenone, Region 3: "Facilities which do have sized secondary containment around the oil storage tanks would also have sized secondary containment around the produced water containers, as both they would generally be in the same secondary containment structure(s) at the facility. This would be the general industry practice for both PA and WV".

on the smaller tank. The estimated cost of sized secondary containment for a facility with the maximum tank capacity of 66,600 gallons (Category III facility) ranges from $5,430 for an earthen berm to approximately $24,300 for a concrete berm.[131] The Agency assumed that the size of the largest stock tank is 80 percent of the size of the produced water tank (based on model facility developed using SPCC Plans obtained by EPA regions). EPA's research shows that a 20 percent reduction in capacity of the largest tank would lead to approximately 8 percent to 11 percent reduction in cost of the sized secondary containment with associated cost savings from $434 to $2,670 for earthen and concrete berms respectively. As a result, owners/operators of facilities with both exempt and non-exempt produced water containers would experience the cost reduction for providing secondary containment for the produced water container.

Exhibit 6-71 presents the estimates of the facility-level cost savings associated with the reduced cost for providing secondary containment for the produced water container.

Exhibit 6-71
Estimated Unit Cost/Cost Savings for New Facilities

Size Category	Capacity of Produced Water Container[1]	Cost of Sized Secondary Containment		Cost Savings	
		Earthen Berm	Concrete Berm	Earthen Berm	Concrete Berm
Category I	2,090 gallons	$1,560	$5,270	$125	$580
Category II	7,770 gallons	$2,810	$15,700	$225	$1,720
Category III	66,600 gallons	$5,430	$24,300	$434	$2,670
Category IV	444,000 gallons	$23,200	$114,000	$1,860	$12,600

[1] Firms incur cost savings only if the largest container in the tank battery is the produced water container. It is also important to note that this is the size of the largest container; a facility may have additional containers within the tank battery.

Cost Increase per Facility

Facilities with Exempt Produced Water Containers

Owner and operators of facilities with exempt produced water containers, piping and appurtenances would incur an additional cost of PE certification, which is based on the determination that the contents of the produced water container, if discharged, do not contain oil in such quantities that may be harmful, as described at 40 CFR part 110. This cost would be a one-time cost incurred by new facilities in Year 1. To certify facility's compliance with discharge requirements, a PE would be concerned as to whether or not a complete discharge of the contents of the produced water container would cause a discharge in quantities that may be harmful to navigable waters or adjoining shorelines. In addition, owners and operators might incur a marginal cost increase to verify and document on an annual basis that the produced

[131] This estimate is derived based on the unit cost inventory, a product developed for the October 2007 proposed rule RIA with input from a PE firm with practice in SPCC compliance. We note that the actual cost of sized secondary containment can very significantly across facilities depending on their facility configuration, location and other factors. For example, inputs from EPA Region 6 indicate that the cost of a 200 bbl tank (8,400 gallons) could range from $900-$1,000 for a dirt berm (Email from Richard Franklin, May 1, 2008), whereas the estimate generated by the PE firm was around $2,810 for a slightly smaller earthen berm.

water characteristics in the container, procedures, or maintenance required to meet the standards of Part 110 that formed the basis for the PE certification are maintained.

Facilities with Non-Exempt Produced Water Containers

EPA estimated the cost of the skimming or a similar oil removing procedure at $1,020 in the first year and $322 in subsequent years (includes the effort to develop and implement the procedure). An oil skimmer ranges in price from approximately $130 to $1,260 with an average of about $700.[132] Based on EPA's judgment, facilities will also have to incur technical labor costs of six hours ($322) per year to operate the skimming devices.

Although the final rule incorporates additional flexibility regarding secondary containment requirements for produced water containers, the following additional measures are required in order to maintain environmental protection under this approach: (1) scheduled inspections/testing of the produced water container and associated piping; (2) corrective action to repair the container or associated piping, and (3) prompt removal of or actions to stabilize and remediate oil discharges associated with the produced water container. None of these measures are expected to result in an additional cost beyond baseline costs for conducting scheduled inspections/testing, corrective action, and removing oil discharges from the produced water containers.

[132] Source: http://www.cleansump.com/Belt_Skimmer.html; Google Shopping search: "oil skimmer -pool -cabinet."

6.13.10 Clarification of the Definition of Permanently Closed Containers

The SPCC rule exempts from applicability and from capacity threshold determinations any oil storage container that is "permanently closed." EPA seeks to address concerns expressed by the regulated community over the definition of a "permanently closed" container, as described in §112.2. According to the definition, in order to permanently close a container: all liquid and sludge must be removed from the container and connecting line; all connecting lines and piping must be disconnected from the container and blanked off; all valves (except ventilation valves) must be closed and locked; and conspicuous signs must be posted on each container stating that it is a permanently closed container and noting the date of closure. Once permanently closed, containers are no longer required to be counted in facility storage capacity calculation, nor are they subject to the other requirements under the SPCC rule.

Variable economic conditions and production rates at production facilities may result in certain containers at a facility going unused for long periods of time. Regulated community members have suggested that permanent closure of such tanks is costly, and undesirable because closing a container impedes bringing it back into use if production rates surge or if economic conditions become more favorable. Members of the regulated community have suggested that EPA provide an option to "temporarily" close tanks, in order to exempt the containers from SPCC applicability. However, EPA maintains that if a tank is not permanently closed, it is still available for storage, and the possibility of a discharge, as described in §112.1(b), remains. Accordingly, EPA does not believe that a regulatory action is warranted to address this issue.

Since the amendment only seeks to provide clarification on the SPCC rule and does not change the regulatory requirements, there would be no cost impact on the oil production facilities.

6.13.11 Oil and Gas Pipeline Facilities

EPA seeks to provide clarification regarding SPCC rule applicability at dry gas production facilities. Under the SPCC rule, EPA does not regulate natural gas. Although the SPCC rule requirements do not apply to such facilities because natural gas does not meet the definition of oil, natural gas facilities may store other products that are considered oil, and thus could be subject to the requirements of the SPCC rule. Because natural gas condensate that can be drawn off of tanks, containers, or other equipment is liquid at atmospheric pressures and temperatures, any accumulations of drip or condensate from natural gas production is considered oil. Therefore, for the purposes of determining SPCC applicability, containers 55 gallons or more in capacity that store condensate must be included in a natural gas facility's total oil storage capacity calculation (ancillary oil storage in other areas of the facility, such as fuel or lubrication oil storage, is also counted). EPA seeks to clarify the applicability of the SPCC rule to oil containers at a natural gas facility, and the different SPCC provisions to which a natural gas facility may be subject. The final rule makes no change in these provisions and is not otherwise intended to impose new requirements on DOT-regulated oil and natural gas pipelines. Rather, by granting operators new flexibility in delineating facility boundaries, the final rule should reduce uncertainty and minimize, if not eliminate, overlapping enforcement.

Since the amendment only seeks to provide clarification on the SPCC rule, and does not change the regulatory requirements, there would be no cost impact. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

6.13.12 Aggregate Cost Savings for Oil Production Facilities

The oil production sector would benefit from the new requirements for Tier I qualified facilities, revisions to the facility diagram requirements, and amendments to the definition of "loading/unloading rack," in addition to amendments specific to the oil production sector such as the six-month delay in preparation and implementation of SPCC Plans and the exemption of flow-through separation and treating equipment from sized secondary containment requirements. The total annualized savings to owners and operators of oil production facilities from all of the final amendments that affect this sector are estimated at $117 million and $116 million at the 3 percent and 7 percent discount rate (see Exhibit 6-72).

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Exhibit 6-72
Estimated Aggregate Annual Cost Savings for Production Facilities from Multiple Rule Components (2007$ Millions)

Option	%	Total Cost Savings for Production Facilities											
		Year											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	10- Year Present Value	Annualized
		1	2	3	4	5	6	7	8	9	10		
Tier I Qualified Facilities													
	0%	$2.31	$1.73	$2.49	$2.58	$2.68	$2.46	$3.36	$2.18	$2.51	$3.00	**$25.3**	**$2.53**
	3%	$2.24	$1.63	$2.28	$2.29	$2.31	$2.06	$2.73	$1.72	$1.92	$2.23	**$21.4**	**$2.51**
	7%	$2.16	$1.51	$2.03	$1.97	$1.91	$1.64	$2.09	$1.27	$1.36	$1.52	**$17.5**	**$2.49**
Marginal Production Facilities													
	0%	$26.1	$25.5	$28.0	$29.1	$30.3	$30.7	$33.9	$32.1	$33.7	$35.8	**$305**	**$30.5**
	3%	$25.4	$24.0	$25.6	$25.9	$26.1	$25.7	$27.5	$25.3	$25.8	$26.6	**$258**	**$30.2**
	7%	$24.4	$22.2	$22.9	$22.2	$21.6	$20.4	$21.1	$18.7	$18.3	$18.2	**$210**	**$29.9**
Six Month Delay for SPCC Plan Preparation and Implementation													
	0%	$22.2	$16.6	$23.8	$24.7	$25.7	$23.6	$32.2	$20.9	$24.0	$28.7	**$242**	**$24.2**
	3%	$21.5	$15.6	$21.8	$22.0	$22.2	$19.7	$26.2	$16.5	$18.4	$21.4	**$205**	**$24.1**
	7%	$20.7	$14.5	$19.5	$18.9	$18.3	$15.7	$20.0	$12.2	$13.1	$14.6	**$167**	**$23.8**
Exempt Flow-through Process Vessels from Secondary Containment													
	0%	$6.73	$5.03	$7.24	$7.52	$7.81	$7.16	$9.77	$6.36	$7.30	$8.73	**$73.7**	**$7.37**
	3%	$6.54	$4.74	$6.63	$6.68	$6.74	$6.00	$7.95	$5.02	$5.59	$6.49	**$62.4**	**$7.31**
	7%	$6.29	$4.39	$5.91	$5.73	$5.57	$4.77	$6.09	$3.70	$3.97	$4.44	**$50.9**	**$7.24**
Facility Diagram													
	0%	$1.52	$1.14	$1.64	$1.70	$1.77	$1.62	$2.21	$1.44	$1.65	$1.97	**$16.6**	**$1.66**
	3%	$1.48	$1.07	$1.50	$1.51	$1.52	$1.36	$1.80	$1.13	$1.26	$1.47	**$14.1**	**$1.65**
	7%	$1.42	$0.99	$1.34	$1.30	$1.26	$1.08	$1.38	$0.84	$0.90	$1.00	**$11.5**	**$1.64**
Loading Rack													
High Estimate													
	0%	$88.2	$87.1	$94.6	$98.4	$102	$104	$114	$110	$115	$121	**$1,030**	**$103**
	3%	$85.6	$82.1	$86.5	$87.4	$88.3	$87.3	$92.4	$86.6	$87.9	$90.3	**$874**	**$103**
	7%	$82.4	$76.1	$77.2	$75.1	$73.0	$69.4	$70.7	$63.8	$62.4	$61.7	**$712**	**$101**

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Exhibit 6-72
Estimated Aggregate Annual Cost Savings for Production Facilities from Multiple Rule Components (2007$ Millions)

Option	%	Total Cost Savings for Production Facilities											
		Year											
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	10- Year Present Value	Annualized
		1	2	3	4	5	6	7	8	9	10		
Midpoint Estimate													
	0%	$44.1	$43.5	$47.3	$49.2	$51.2	$52.1	$56.8	$54.8	$57.4	$60.7	**$517**	**$51.7**
	3%	$42.8	$41.0	$43.3	$43.7	$44.2	$43.6	$46.2	$43.3	$44.0	$45.1	**$437**	**$51.3**
	7%	$41.2	$38.0	$38.6	$37.5	$36.5	$34.7	$35.4	$31.9	$31.2	$30.8	**$356**	**$50.7**
Low Estimate													
	0%	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**	**$0.0**
Total[1]													
	0%	**$103**	**$93.4**	**$110**	**$115**	**$119**	**$118**	**$138**	**$118**	**$126**	**$139**	**$1,180**	**$118**
	3%	**$100**	**$88.1**	**$101**	**$102**	**$103**	**$98.5**	**$112**	**$93.0**	**$96.9**	**$103**	**$998**	**$117**
	7%	**$96.2**	**$81.6**	**$90.2**	**$87.6**	**$85.2**	**$78.4**	**$86.1**	**$68.6**	**$68.8**	**$70.6**	**$813**	**$116**

[1] Includes midpoint estimate for savings associated with loading/unloading racks.

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6.14 Man-Made Structures

The Agency seeks to clarify that certain man-made features, such as building walls, basement structures, and drainage systems, may be taken into consideration in determining how to comply with SPCC requirements. If an oil container at a regulated facility is located inside a building, the PE or facility owner/operator certifying the SPCC Plan may take into consideration the ability of the building walls and/or drainage systems to serve as secondary containment for the container.

Since this amendment only seeks to provide clarification and does not change the regulatory requirements, it is not expected to result in any change in cost. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

6.15 Underground Emergency Diesel Generator Tanks at Nuclear Power Stations

6.15.1 Background

EPA is exempting underground oil storage tanks located at nuclear power generation facilities licensed by the Nuclear Regulatory Commission (NRC). This exemption includes both tanks that are completely buried and tanks that are below-grade and vaulted. An underground storage tank or UST is defined in 40 CFR part 280 as "any one or combination of tanks …the volume of which is 10 percent or more beneath the surface of the ground." Below-grade vaulted tanks and completely buried tanks that serve as underground emergency diesel generator tanks at nuclear power plants fall within this definition. EPA believes that the NRC operating safety requirements best address the specific and unique operational challenges at nuclear power plants. A site visit by EPA to a nearby nuclear power station provided information to demonstrate similarities between UST safety measures implemented under NRC regulations and SPCC requirements applicable to underground tanks.

6.15.2 Universe of Affected Facilities

6.15.2.1 Nuclear Power Plants Subject to SPCC

At nuclear power plants, each nuclear reactor unit is required to have at least two emergency diesel generators (EDGs) on site.[133] The NRC requires that nuclear power plants have enough emergency diesel fuel available to run the EDGs for seven days.[134] A site visit by EPA suggests that the backup diesel fuel for these EDGs is stored in aboveground and underground tanks on the site. EPA also assumes that all nuclear plants have USTs to supply diesel fuel for EDG systems. The Utility Solid Waste Activities Group (USWAG), a utility trade association, indicated that there are approximately 163 USTs at existing nuclear power plants.

[133] U.S. Department of Energy, Office of Fossil Energy, May 2006, "Assessment of the Potential Costs and Energy Impacts of Spill Prevention, Control, and Countermeasure Requirements for Nuclear Power Plant Emergency Diesel Generator Tanks."

[134] U.S. Nuclear Regulatory Commission, February 2007, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, NUREG-0800. Available at: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/.

In addition, the Agency believes that all EDG systems at the nuclear power plants have day tanks, whose cumulatively storage capacity may exceed the 1,320-gallon capacity. EPA estimates that all nuclear power plants have cumulative aboveground oil storage capacities in excess of the 1,320-gallon threshold due to the presence of ASTs to supply USTs, day tanks and oil-filled operation equipment (EDGs), which comprise the EDG system at a nuclear power plant. Furthermore, since most nuclear plants are located in coastal areas or close to other navigable waters or adjoining shorelines, EPA infers that all nuclear power plants are subject to the SPCC regulation.

Although the Agency does not have comprehensive information on the storage capacity of underground tanks at nuclear power plants, the power plants contacted indicated total storage capacities under 1 million gallons.[135] Therefore, EPA assumed that most nuclear power plants could be classified as Category III with total storage capacity between 42,000 gallons and 1 million gallons.

6.15.2.2 Number of Existing Nuclear Power Plants

To estimate the number of facilities affected by this final amendment, EPA used data sources described in this section. The Nuclear Regulatory Commission reports 104 operating nuclear power reactors in 31 states.[136] Those 104 reactors are located at 65 sites; of these, 33 sites have two or more operating nuclear reactors. For the purpose of this analysis, the Agency used the number of sites as a proxy for the number of facilities since EDG systems that store oil are normally shared by the reactors. As a result, EPA estimated the total number of existing nuclear power plants at 65.

6.15.2.3 Number of New Generating Units at Nuclear Power Plants

An unfavorable business environment has prevented licensing and construction of new nuclear plants in the United States for more than three decades. No new nuclear plants have been built in the United States since 1974. The last new nuclear generating unit at an existing plant brought online in the United States began operation in 1996. Since then, changes in U.S. nuclear capacity have resulted only from up-rating of existing units and retirements. However, in "Annual Energy Outlook 2007 with Projections to 2030," DOE/EIA projects additions of new nuclear power plants.[137] Upcoming construction of new nuclear plants is primarily attributed to the new tax credit allowing facility owners to reduce their tax liability. Because the earliest date at which the first new nuclear unit eligible for the tax credit could become operational is about 2015, the "de-indexing" of the tax credit has the effect of reducing its real value by about 25 to 30 percent.

[135] North Anna nuclear power reactor, located 40 miles northwest of Richmond, Virginia: underground storage is two tanks of 50,000 gallons each, resulting in total underground capacity of 100,000 gallons; aboveground storage is about 215,000 gallons. Grand Gulf 1 nuclear power reactor, located 25 miles south of Vicksburg, Mississippi: underground storage is three tanks of 75,000 gallons each, resulting in total underground capacity of 225,000 gallons.

[136] U.S. Nuclear Regulatory Commission, Facility Info Finder http://www.nrc.gov/info-finder/reactor/. Accessed June 24, 2008.

[137] U.S. DOE, Energy Information Administration, February 2006, "Annual Energy Outlook 2007 with Projections to 2030," . Available at: http://tonto.eia.doe.gov/ftproot/forecasting/0383(2007).pdf.

Based on information provided by USWAG, each of the new units will have its own EDG system, including EDG fuel tanks. As a result, to assess an economic impact of the final option, EPA estimated the number of generating units at nuclear power plants. The NRC licenses all commercially owned nuclear power plants that produce electricity in the United States. As a result, the NRC reports the number of nuclear power plant applications it expects to receive each calendar year through 2009.[138] EPA also consulted with USWAG on the number of expected construction/operating licenses for new units at nuclear power plants.[139] Combining the information on the number of new units provided by NRC and USWAG, EPA estimated approximately 33 new generating units at 25 sites. Applications for those units are expected to be submitted in 2008-2009. Due to an extended period of licensing and construction, the first generating unit at a nuclear power plant is only expected to come online in 2015. Given the expected applications, EPA assumed that seven new units at nuclear plants would start operation in 2015, 22 units in 2016, and three units in 2017 and one unit in 2018. The time period considered in the regulatory impact analysis for the final amendments is 2010 through 2019. In the remaining years of the analysis, no new units at nuclear plants are projected to come online.

Exhibit 6-73 presents the projected number of new generating units at nuclear power plants from the analysis period of 2010 through 2019.

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[138] U.S. Nuclear Regulatory Commission, June 4, 2008, "Expected New Nuclear Power Plant Applications," http://www.nrc.gov/reactors/new-licensing/new-licensing-files/expected-new-rx-applications.pdf.

[139] Jim Roewer, Executive Director, USWAG, August 2007, personal communication.

Exhibit 6-73
Projected Number of New Generating Units at Nuclear Power Plants, Assuming Full Compliance in the Baseline

Category	Number of New Generating Units at Nuclear Power Plants									
	2010 Year 1	2011 Year 2	2012 Year 3	2013 Year 4	2014 Year 5	2015 Year 6	2016 Year 7	2017 Year 8	2018 Year 9	2019 Year 10
Category I	-	-	-	-	-	-	-	-	-	-
Category II	-	-	-	-	-	-	-	-	-	-
Category III	-	-	-	-	-	7	22	3	1	-
Category IV	-	-	-	-	-	-	-	-	-	-

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6.15.3 Baseline Compliance Cost and Cost Savings

As a result of the final amendment, EPA expects that owners and operators of nuclear power plants would lower their total compliance costs due to cost savings associated with the exemption of underground storage tanks. Primarily, a facility owner/operator would save the cost for installation and maintenance of secondary containment for underground tanks. The Agency assumed that this amendment would not change engineering practice with respect to tank inspections because the NRC Regulatory Guide requires inspection and testing of fuel oil systems.[140]

To estimate cost savings associated with the final amendment for nuclear power plants, based on information provided by USWAG, EPA assumed that on average, underground storage tanks account for approximately one-third of the total oil storage capacity at a nuclear plant. Therefore, facility owners and operators would save about 33 percent of the compliance cost associated with the secondary containment requirement.

Based on information provided by USWAG, EPA assumed that most owners and operators of power plants determine "impracticability" of secondary containment for underground tanks and provide a written commitment of manpower, equipment, and materials, as well as a contingency plan prepared in accordance with 40 CFR part 109. Therefore, based on the final amendment, facility owners and operators would save the cost of determining impracticability of secondary containment for underground storage tanks. EPA assumes that, consistent with EPA and OMB economic guidelines, existing facilities are in full compliance with the existing SPCC requirements and only new facilities would incur cost savings from this final amendment. The Agency estimates that the cost savings for not having to determine impracticability would be $615 per generating unit.[141] As a result, the cost savings to owners/operators of nuclear power plants would be equal to the baseline cost of compliance with this requirement.

The total cost savings from the final amendment were calculated by multiplying the unit cost savings with the total number of new generating units at nuclear power plants expected to become operational during the analysis period. EPA estimated that on average, the final amendment would reduce compliance costs by about $5,000 and $4,910 per year, discounted at 3 percent and 7 percent, respectively (see Exhibit 6-74).[142]

[140] National Response Center. 1979. NRC Regulatory Guide 1.137. Fuel-Oil Systems for Standby Nuclear Generators. Available at: http://adamswebsearch2.nrc.gov/idmws/doccontent.dll?library=PU_ADAMS^PBNTAD01&ID=003957234 , accessed July 2, 2008. EPA assumes that facility owners and operators comply with the NRC requirements.

[141] Calculated as one-third of the cost for impracticability determination ($1,850). Data source: SCS Engineers, January 2007.

[142] Calculated as a four-year average for the years of the analysis period when the cost savings occur (2015 through 2018).

Exhibit 6-74
Projected Annual Compliance Cost Savings from the Final Amendment for Nuclear Power Plants (2007$)[1]

	Compliance Cost Savings											
	2010 Year 1	**2011 Year 2**	**2012 Year 3**	**2013 Year 4**	**2014 Year 5**	**2015 Year 6**	**2016 Year 7**	**2017 Year 8**	**2018 Year 9**	**2019 Year 10**	**4- Year Present Value[2]**	**Annualized**
Not Discounted	-	-	-	-	-	$4,300	$13,500	$1,840	$615	-	**$20,300**	**$5,070**
3% Discounted	-	-	-	-	-	$3,600	$11,000	$1,460	$471	-	**$19,200**	**$5,000**
7% Discounted	-	-	-	-	-	$2,870	$8,420	$1,070	$334	-	**$17,800**	**$4,910**

1 The baseline cost of compliance is the same as the compliance cost savings.
2 Cost savings are projected for four years only, based on the expected applications of new nuclear units.

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6.16 Wind Turbines

The Agency is providing clarity on the applicability of the rule to wind turbines used to produce electricity. EPA believes that these wind turbines meet the definition of oil-filled operational equipment promulgated in the December 2006 SPCC rule amendments (71 FR 77266, December 26, 2006) and thus can take advantage of the alternative compliance option provided to this type of equipment. Since the Agency is only providing clarity on the applicability of the rule, there would be no cost impact. Conceivably, there could be cost savings that result from the reduced transaction cost of understanding the rule, but EPA does not have sufficient information to quantify these savings.

6.17 Overall Compliance Cost Savings

The Agency estimates that the final SPCC amendments would result in significant compliance burden reduction for industry as compared to the 2002 rule. The total cost savings ranges from a low estimate of $113 million and $112 million, a mid-point estimate of $168 million and $166 million and a high estimate of $223 million and $221 million at the 3 percent and the 7 percent discount rates respectively. The low estimate reflects the low estimate for loading racks (2.4 percent of category III and IV farms and 0 percent of production facilities affected), security requirements (50 percent of all facilities affected) and AFVO (40 percent of AFVO facilities affected); high estimate reflects the high estimate for loading racks (14 percent of category III and IV farms and 33.3 percent of production facilities affected), security requirements (75 percent of all facilities affected) and AFVO (90 percent of all AFVO facilities affected); and the mid-point estimate reflects the mid-point of the low and high estimate for loading racks (8.2 percent of category III and IV farms and 16.5 percent of production facilities affected), security requirements (75 percent of all facilities affected) and AFVO (65 percent of AFVO facilities affected).

Exhibit 6-75 presents the costs savings by all the amendments at the 3 percent and 7 percent discount rate. At the 7 percent discount rate, the mid-point estimate of the annualized cost savings from final amendments to the SPCC rule are approximately $8 million from the exemption of hot-mix asphalt containers, $4 million from the changes for farms, $2 million from the exemption of residential heating oil containers, $3 million from changes in facility diagram requirements, $51 million from revision to the loading rack definition, $24 million from the streamlined requirements for Tier I qualified facilities, $9 million from the amendments to the security requirements, $11 million from the amendments to integrity-testing requirements, $2 million for owners and operators of AFVO facilities, $24 million for owners and operators of production facilities from the six-month delay in SPCC Plan preparation and implementation, $7 million from the exemption of flow-through process vessels from sized secondary containment, $30 million for small production facilities with marginal wells, and less than $1 million from the exemption of underground oil storage tanks at nuclear power generation facilities.[143]

[143] It is important to note that certain amendments have an effect across all the industries and so are not included in estimates of the costs savings from amendments that only affect a specific industry. Amendments with such effects across all industries include the proposed amendments to Tier I qualified facilities, definition of "facility," loading/unloading rack requirements, and security requirements.

Exhibit 6-75
Summary of Estimated Cost Savings Associated with the Final Amendments (2007$ Millions)

Rule Component/Scenario[1]	Annualized Cost Savings	
	Discounted at 3%	Discounted at 7%
Hot-mix Asphalt		
Exempt HMA containers	$8	$8
Farms		
Exempt pesticide application equipment and related mix containers; applicability of mobile refueler requirements to farm nurse tanks	$4	$4
Residential Heating Oil Containers		
Exempt residential heating oil containers	$2	$2
Facility Definition		
Clarify the definition of "facility"	No cost impact	No cost impact
Facility Diagram		
Revise facility diagram requirement	$3	$3
Loading/Unloading Racks		
Define "loading/unloading rack"		
Low Estimate	Less than $1	Less than $1
Mid-Point Estimate	$51	$51
High Estimate	$103	$102
Tier I Qualified Facilities		
Provide streamlined requirements for Tier I qualified facilities with aggregate storage capacity less than 10,000 gallons and no containers greater than 5,000 gallons	$24	$24
General Secondary Containment		
Final revisions to the general secondary containment provision	No cost impact	No cost impact
General Secondary Containment for Non-Transportation-Related Tank Trucks		
Extend regulatory relief for mobile refuelers to non-transportation-related tank trucks	No cost impact	No cost impact
Security Requirements		
Low Estimate (50% of all facilities affected)	$6	$6
Mid-Point Estimate (75% of all facilities affected)	$9	$9
High Estimate (100% of all facilities affected)	$12	$12
Integrity Testing		
Greater flexibility in the use of industry standards for integrity testing requirements	$11	$11
Animal Fats and Vegetable Oil		
Amend integrity testing requirements for AFVO containers that meet certain criteria		
Low Estimate (40% of facilities affected)	$1	$1
Mid Point Estimate (65% of facilities affected)	$2	$2
High Estimate (90% of facilities affected)	$3	$3
Oil Production Facilities		
Six month delay for Plan preparation and implementation	$24	$24
Exempt flowlines and gathering lines from secondary containment	No net cost impact	No net cost impact
Flow-through process vessels	$7	$7
Streamlined requirements for small production facilities with marginal wells	$30	$30
Exempt produced water storage containers	No cost savings estimated	No cost savings estimated
Man-Made Structures		
Consider manmade structures in determining SPCC rule applicability	No cost impact	No cost impact
Nuclear Power Stations		

Exhibit 6-75
Summary of Estimated Cost Savings Associated with the Final Amendments (2007$ Millions)

Rule Component/Scenario[1]	Annualized Cost Savings	
	Discounted at 3%	Discounted at 7%
Exempt underground oil storage tanks at nuclear power generation facilities	Less than $1	Less than $1
Wind turbines		
Clarify applicability of the rule to wind turbines used to produce electricity	No cost impact	No cost impact
Total: Low Estimate	**$122**	**$121**
Total: Mid-Point Estimate	**$177**	**$176**
Total: High Estimate	**$232**	**$230**

[1] Cost impacts are presented by rule component; impacts across industries are not separated out. See Section 6.2 for the aggregate cost effect on farms and Section 6.13 for the aggregate cost effect on the production sector.

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Chapter 7

Impacts on Human Health, Welfare and the Environment

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7 Impacts on Human Health, Welfare and the Environment

The principal effect of the final amendments is lower compliance costs for owners and operators of certain types of facilities, as discussed in detail in Chapter 6. There would be environmental and human health impacts of final rule amendments if the amendments result in a change in threat of discharge. Thus, the first step is to determine if the amendments have an impact on discharges. In the absence of detailed data on oil discharges, it is difficult to assess quantitatively the extent to which the final amendments are likely to affect the oil discharge threat, i.e., to estimate, for each change, the corresponding increase or decrease in both the incident frequency and volume of oil discharged. Therefore, the Agency relied on available sources of information, including available data on historical oil discharges, to inform a qualitative evaluation of changes in oil discharge threat.

7.1 Oil Discharge Threat

The following sections provide a qualitative assessment of the impact of the final rule amendments on the oil discharge threat, focusing on those factors most likely to affect either the frequency of incidents, or the volume of oil discharged. Final amendments that are intended only to provide clarity on rule requirements are not discussed here, as they are not expected to affect the oil discharge threat. As discussed in detail in the sections below, the Agency concludes that the final amendments provide relief in areas that are expected to be equally protective of the environment and are not likely to change the threat of discharge. For example, EPA is exempting HMA containers since the properties of HMA make it unlikely to “flow” into navigable waters or adjoining shorelines; EPA is providing flexibility to owners and operators to determine the appropriate integrity testing of animal fat and vegetable oil (AFVO) containers that meet specific requirements (shop-built, bottom drainage) that reduce corrosion damage and therefore reduce the likelihood of an oil discharge.

7.1.1 Hot-mix Asphalt (HMA)

EPA is exempting HMA containers from SPCC requirements. Since HMA material (the mixture of asphalt cement and aggregates) is unlikely to flow as a result of the entrained aggregate, there is no reasonable expectation that any release of HMA would reach navigable waters or adjoining shorelines. This is illustrated by the lack of incidents reported either to the National Response Center (NRC) or in the news media of discharges of hot-mix asphalt mixtures to navigable waters or adjoining shorelines from fixed facilities regulated under SPCC. Further, Regional Administrators would continue to have the option under §112.1(f) to require an owner or operator of a facility, including one solely handling or storing HMA mixtures, to prepare or amend and implement an SPCC Plan or any applicable part, including HMA containers, if a determination is made that it is necessary in order to prevent a discharge of oil into waters of the United States or upon adjoining shorelines. Therefore, this change is not likely to affect the threat of an oil discharge.

7.1.2 Farms

EPA is exempting pesticide application equipment and related mix containers regardless of use location from SPCC requirements. As noted in Section 6.2.3.1, a couple of studies suggest that the capacity of pesticide application equipment can range from 500 gallons to 1,200 gallons depending on the farm size.[144] However, in evaluating the threat posed by pesticide containers and application equipment when promulgating the Standards for Pesticide Containment Structures in 40 CFR part 165, Subpart E, under authority from the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), EPA's Office of Pesticide Programs (EPA/OPP) noted that on-farm bulk storage of pesticides remains rare. Further, EPA/OPP found that there was insufficient evidence of contamination occurring as a result of these containers or equipment to warrant their regulation under the pesticide container-containment rule. This may be the result of best management practices such as "Farm*A*Syst" programs (partnerships between government agencies and private business that foster pollution prevention on farms) that some states have, which suggest that farms: (1) adhere to pesticide label instructions and prepare only the necessary amount needed for immediate use; (2) prepare the pesticide mix immediately before application; (3) fill the equipment spray tank half full with water prior to mixing in the pesticide formulation; and (4) mix and load pesticides on a concrete pad.[145] Therefore, EPA expects that the pesticide application equipment would not pose a significant threat of discharge and the final rule amendment is not likely to change the discharge threat as compared to the baseline.

EPA is also exempting farms from the loading/unloading rack requirements of §112.7(h).

7.1.3 Residential Heating Oil Containers

EPA is exempting containers that are used to store oil for the sole purpose of heating a single-family residence. The residential oil containers are typically either 275 gallons or 550 gallons in size. To the extent that a smaller total storage capacity has lower threat of discharge (EPA's 1995 Survey of Oil Storage Facilities suggests that an important determinant of discharge threat is the total oil storage capacity), this amendment is not expected to have an impact on oil discharge threat.

7.1.4 Loading/Unloading Rack

By defining "loading/unloading rack," EPA clarified the applicability of §112.7(h), which requires sized secondary containment for areas where loading/unloading racks are located. Oil and gas production facilities and farms would be excluded from §112.7(h) altogether, as these facilities do not normally have loading/unloading racks. Areas at facilities where transfers occur and

[144] Virginia Cooperative Extension, 2001, "Economic Analysis of Pesticide Application Equipment," Farm Business Management Update. Available at: http://www.ext.vt.edu/news/periodicals/fmu/2001-10/economicanalysis.html. Lessiter, Mike, 2007, "Purchasing a Sprayer - Demystifying the Payback," Farm Equipment. Available at: http://www.lesspub.com/cgi-bin/site.pl?332&ceNews_newsID=2750.

[145] Farm-A-Syst North Carolina, April 1997, *Improving Storage and Handling of Pesticides*. Available at http://www.soil.ncsu.edu/assist/pesticides/.

racks are not present would still be required to have general secondary containment as required under §112.7(c).

The amendment is intended to formalize and confirm the rule text that EPA provided in a past Federal Register notice (69 FR 29728): "We interpret §112.7(h) only to apply to loading and unloading 'racks'," and it is therefore expected to cause no incremental change to the threat of oil discharge.

7.1.5 Tier I Qualified Facilities

EPA is further streamlining requirements for a subset of qualified facilities. Under this option, EPA would allow qualified facilities with a maximum container capacity of 5,000 gallons (called "Tier I qualified facilities") to complete and implement a self-certified SPCC Plan, following a template provided by EPA. Qualified facilities are not required to have their Plans certified by a Professional Engineer (PE). Additionally, the use of the simplified Tier I template does not allow for a "hybrid" approach whereby a PE certifies sections of the Plan that involve environmentally equivalent measures or determinations that secondary containment is impracticable. Therefore, minimal to no involvement of a PE is expected in the development of an SPCC Plan at a Tier I qualified facility. EPA designed the Tier I template to be straightforward and simple for a Tier I facility owner/operator to complete. The Plan is meant to cover relatively simple operations, such as those where only containers up to 5,000 gallons would be used, and for which appropriate discharge prevention measures are relatively standard and can more readily be selected and implemented.

In designing the template, EPA removed certain provisions that do not apply to Tier I facilities (based on the criterion that they would not have oil containers with capacities greater than 5,000 gallons). For example, the requirement for brittle-fracture evaluation (§112.7(i)) has been removed. This provision is only applicable to field-constructed aboveground containers that would be potentially subject to brittle-fracture failure—which are by their nature larger size containers greater than 5,000 gallons in capacity. Certain other provisions have been removed or tailored for Tier I facilities directly because of the reduction in threat of discharge at a facility with only smaller size containers. For example, the requirement to prepare a facility diagram was removed for Tier I facilities, because qualified facilities with a maximum container capacity of 5,000 gallons are expected to be small and simple in configuration—most qualified facilities have only a few containers, since the facility total storage capacity for qualified facilities may not exceed 10,000 gallons. The benefit of a diagram for such simple facility layouts would be minimal, and removing this requirement is therefore not expected to increase the threat of oil discharge. Finally, EPA specifically set a single-container capacity limit of 5,000 gallons by considering industry standards for integrity inspections of bulk storage containers, which make a distinction for this size container in terms of the level of expertise and inspection frequency needed to assess the continued integrity of an in-service container.

In summary, due to the Tier I eligibility criteria that EPA is finalizing, the streamlining of SPCC Plan elements for Tier I qualified facilities does not pose an increase in oil discharge threat.

7.1.6 Security

EPA is amending the rule to allow facility owner/operators to tailor their security measures to the facility's specific characteristics and location, rather than comply with the current, more prescriptive set of requirements. This would provide a facility owner/operator with the flexibility to determine the most adequate security measures to protect the facility from vandalism and to assist in the discovery of oil discharges. For example, the final amendment tailors the requirement for fencing to allow an owner/operator to only install fencing around the oil handling, processing, and storage areas of facility, rather than install fencing around the entire facility.

Because the security requirements, found at §112.7(g), in the 2006 SPCC rule are subject to environmental equivalence under §112.7(a)(2), a facility owner/operator currently does have the flexibility to provide tailored security measures by demonstrating that the alternative measures are environmentally equivalent to the required measures in §112.7(g). Therefore, the final amendment is not expected to affect the threat of an oil discharge.

7.1.7 Animal Fats and Vegetable Oils

The final rule allows the PE or owner/operator certifying an SPCC Plan at a facility that is subject to the U.S. Food and Drug Administration (FDA) regulation found at 21 CFR part 110, *Current Good Manufacturing Practice in Manufacturing, Packing, or Holding of Human Food,* to determine the type of integrity testing appropriate for shop-built containers that store fully refined food oil and also satisfy other requirements. This rule amendment would tailor the requirements in §112.12(c)(6) of the 2006 SPCC rule for eligible containers, which require containers to be tested on a regular schedule, using a combination of both visual inspection and another non-destructive testing technique. Instead, the Plan preparer can design a testing program and schedule that is best suited for these eligible food oil containers.

Because the integrity testing requirements, found at §112.12(c)(6), are currently subject to environmental equivalence under §112.7(a)(2), a facility owner/operator currently does have flexibility to specify an alternative integrity testing program by demonstrating that the alternative is environmentally equivalent to the required measures in §112.12(c)(6). Additionally, in developing the rule amendment, EPA determined the eligibility criteria for this streamlined requirement specifically to keep the threat of oil discharge that may occur from less stringent testing requirements the same. The regulation at 21 CFR part 110 specifies requirements for the design, construction, and use of equipment used at food processing facilities, including containers that hold oil. Other criteria, such as requiring that containers must be made from austenitic stainless steel, and be self-draining, ensure that the containers are less likely to suffer from corrosion. Criteria such as the requirement for containers to be shop-built and have manholes for internal inspection are design elements that make visual inspection an effective inspection method, should the Plan preparer rely on visual inspection only. Therefore, this amendment is not likely to increase the threat of oil discharge.

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7.1.8 Oil Production Sector

EPA is making several amendments that would affect oil and gas production facilities. These include amendments to the Plan preparation and implementation date, and secondary containment requirements for flow-through process vessels and flowlines and intra-facility gathering lines. Additionally, EPA is amending the requirements that apply to produced water containers, piping and appurtenances by providing two alternative approaches as options for containers that meet specified criteria.

Six-month delay: EPA is extending, by six months, the timeframe by which the owner or operator of a new production facility must prepare and implement an SPCC Plan. A facility owner or operator is likely to use this relief to develop an SPCC Plan and certify it after operations have stabilized. The alternative option would allow an owner or operator of a new production facility one year to prepare and implement an SPCC Plan. It is difficult to determine what the effect of this delay would be on the oil discharge threat and if there is a higher likelihood of threat in the initial months while operations are beginning. The data on oil discharges does not provide information on the age of the facility.

Flow-through process vessels: EPA is also providing an alternative option for flow-through process vessels at oil production facilities to comply with the general secondary containment requirement and additional oil spill prevention measures in lieu of sized secondary containment requirements. The Agency estimates that a large percentage of these installations are already within a facility's tank battery and therefore have adequate sized containment; only heater-treaters are likely to be located outside the tank battery. The oil discharge threat would likely change only insofar as heater-treaters outside the tank battery would be subject to general containment rather than sized secondary containment, where the former are built to prevent a "typical" discharge.

Since the relief provided by this amendment is subject to revocation if a facility has a reportable discharge,[146] EPA expects that it would not have a significant negative effect on oil discharge threat. For flow-through process vessels, EPA is also finalizing the amendment to require the inspection of equipment components, including ancillary equipment; prompt removal of any oil accumulations; and corrective action should a discharge occur. These requirements are expected to provide further protection from oil discharges.

Flowlines and intra-facility gathering lines: EPA is also amending the rule to replace secondary containment requirements for flowlines and intra-facility gathering lines with the requirement for a contingency plan and written commitment of resources, without the requirement for an impracticability determination. EPA is providing more prescriptive requirements for a flowline/intra-facility maintenance program.[147] Flowlines are certainly at threat of discharges.

[146] A "reportable spill" means reportable to EPA under §112.4: (1) a single spill of oil to navigable waters exceeding 1,000 U.S. gallons or (2) two spills of oil to navigable waters each exceeding 42 U.S. gallons within any 12-month period, in the three years prior to the SPCC Plan certification date, or since becoming subject to the SPCC rule if the facility has been in operation for less than three years.

[147] If an FRP has already been developed under §112.20, then the contingency plan will not be necessary.

The Agency believes that given the difficulty of implementing secondary containment for flowlines over long runs of piping and split land ownership, under the current SPCC rule all production facilities claim impracticability.[148] Therefore, this change in effect only modifies the justifications required of facility owners and operators to explain why containment is impracticable at onshore oil production facilities. Therefore, this change is not expected to have an effect on oil discharge threat. In lieu of a secondary containment requirement, EPA is requiring a contingency plan and written commitment of manpower, equipment, and materials for flowlines and intra-facility gathering lines at an oil production facility, and to prescribe specific requirements for a flowline and intra-facility gathering line maintenance program. The requirements that are expected to prevent discharges, improve discharge detection, and mitigate discharges include:

1. Compatibility of flowlines and intra-facility gathering lines and associated valves and equipment with the type of production fluids and their potential corrosivity, volume, and pressure, and other conditions expected in the operational environment

2. Visual inspection for leaks, discharges, corrosion, etc.

3. Corrective action/repairs

4. Prompt removal of any accumulations of oil discharges.

Produced water containers: EPA is providing two alternative approaches for produced water containers: an exemption of those containers, piping and appurtenances that do not contain oil or an option to implement general secondary containment, along with additional inspection, maintenance and corrective actions, in lieu of sized secondary containment. EPA anticipates that neither of the two approaches will have an impact on the threat of oil discharges from produced water containers.

Under the first alternative, EPA is exempting certain produced water containers, piping and appurtenances at oil production facilities from the requirements of the SPCC rule when a PE certifies, as part of the SPCC Plan, that based on the efficiency of the oil/water separation technology used, the contents of a produced water container, piping and appurtenances does not contain oil in amounts that may be harmful in the event of a discharge to navigable waters or adjoining shorelines. Since these containers are not expected to contain oil, they may not be involved in a discharge as described in §112.1(b) and there should be no change in oil disharge threat resulting from their exclusion. Under the second alternative, the facility owner has the option to implement general secondary containment and conduct visual inspections, maintenance, and corrective action, in lieu of sized secondary containment, subject to description in the Plan, and PE certification, that a practice is established that is designed to remove and minimize the amount of free-phase oil from the produced water container on a scheduled and routine basis. The alternative measures were carefully designed to mitigate the discharge threat from produced water containers. The inspections and maintenance activities

[148] Review of SPCC Plans and inputs from EPA regions both suggest that facilities do not have secondary containment around flowlines.

are aimed at detecting potential issues associated with produced water containers before a discharge may occur, while the scheduled and routine removal of free-phase oil that accumulate in the produced water container is expected to decrease the volume of oil that may be discharge in the event of a release. EPA's review of spill incidents reported to the NRC and to selected states, summarized in the docket,[149] identified overfills and leaks as common causes of discharges from produced water tanks. Under the alternative requirements, facilities must provide general secondary containment which would serve to contain the volume of the most likely discharge within the facility until cleanup occurs. Finally, as for flow-through process vessel, both alternative approaches for produced water containers are subject to revocation if a facility has a reportable discharge from a produced water container. Given these factors, EPA expects that the rule amendments will not have a significant negative effect on the threat of an oil discharge from produced water containers.

Small production facility: The change in oil discharge threat for the relief due to small production facilities is associated with the self-certification of an SPCC Plan, as compared to a PE-certified SPCC Plan. The approach to self-certify the SPCC Plan provides regulatory relief at oil production facilities by decreasing the cost of compliance with the SPCC rule requirements. Oil production facility owners and operators who prepare and maintain self-certified SPCC Plan templates are also required to implement discharge prevention measures. Consequently, EPA believes that differences in the frequency and/or discharge volume (and therefore the oil discharge threat) at oil production facilities that maintain self-certified in comparison to PE-certified Plans may not change. However, it is important to note that because this streamlined requirement of allowing a self-certified template in place of a PE-certified SPCC Plan was introduced by the 2006 SPCC final rule amendments, there are no data available that would support a comparative analysis of discharge history at facilities that maintain a self-certified versus PE-certified SPCC Plans.

The Agency also considered the discharge history of facilities and reasons that some facilities may not fully comply with SPCC requirements at the time of inspection. These reasons may include the lack of a PE-certified SPCC Plan; the analysis could compare these data to discharge history of facilities that were in compliance with SPCC requirements. This would help characterize the extent to which SPCC compliance – as enhanced by the EPA approach to self-certify an SPCC Plan – may reduce the oil discharge threat. Such detailed discharge history data, however, are not readily available. The relationship between oil discharge threat (frequency and volume) and SPCC compliance was explored in the 1995 facility survey and has been reported in prior analyses.

Loading/Unloading Racks: EPA is exempting oil production facilities from the requirements for loading/unloading racks in §112.7(h).

[149] U.S. Environmental Protection Agency. "Considerations for the Regulation of Onshore Oil Exploration and Production Facilities Under the Spill Prevention, Control, and Countermeasure Regulation (40 CFR Part 112)". May 30, 2007.

7.2 Distributional Analysis

The final amendments to the SPCC rule would result in direct and indirect effects that may precipitate the transfer of economic benefits among various industry sectors. One direct impact of the amendment is the alternative offered to owners and operators of qualified facilities that allows them to use a template SPCC Plan. Additionally, facilities that store animal fats and vegetable oils may not have to perform integrity testing on their tanks, and owners and operators of production facilities would have lower compliance cost, while all facilities would have the flexibility to choose adequate site-specific security measures and would consequently have lower compliance costs. This revised SPCC rule also gives flexibility to facilities to define non-contiguous parcels as different facilities in a way that minimizes their cost.

Indirect effects of the final amendments could include changes in demand for fencing and gates insofar as the final amendment no longer requires the facility boundary to be fenced. The reduction in demand for fencing would result in a transfer of income from suppliers to owners and operators of facilities. In the same way, to the extent that AFVO facilities were relying on outside professionals to conduct integrity testing, the fee that was previously charged by professionals would instead be transferred back to owners and operators of AFVO facilities. Further, to the extent that the facilities would rely on Professional Engineers to determine the type of integrity testing that should be conducted, there could be a transfer of resources from the owners and operators of AFVO facilities to the engineers. The net impact on a comprehensive measure of social welfare such as social cost has not been estimated.

Another aspect of the distributional analysis is the spatial impact of the rule with respect to the location of industry-wide regulated facilities. EPA's technique for estimating the SPCC universe described in Chapter 3 limits the capacity to meaningfully consider the spatial distribution of SPCC-regulated facilities. However, EPA acknowledges that clustering of SPCC-regulated facilities exists (such as oil production facilities in the Gulf of Mexico coastal states), and, therefore, nationally estimated impacts on owners and operators of regulated facilities may be spatially disproportional.

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Chapter 8

Small Entity Impacts, Executive Orders, and Other Required Analyses

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8 Small Entity Impacts, Executive Orders, and Other Required Analyses

The purpose of this report is to present the final amendments and the alternatives considered and to analyze their respective costs and benefits. In addition to these analyses, several other types of impacts are important to consider in evaluating the effects of a regulation. This chapter presents analyses that report whether the amendments to the SPCC rule portion of the Oil Pollution Prevention regulations impact the financial condition of small entities, as required by the Regulatory Flexibility Act (RFA)[150] and Small Business Regulatory Enforcement Fairness Act (SBREFA).[151] It also responds to Executive Order 13132–Federalism[152]; Executive Order 13175–Consultation and Coordination With Indian Tribal Governments[153]; Executive Order 13045–Protection of Children From Environmental Health & Safety Risks[154]; Executive Order 13211–Actions That Significantly Affect Energy Supply, Distribution, or Use[155]; National Technology Transfer and Advancement Act; and the Paperwork Reduction Act (PRA).[156]

8.1 Regulatory Flexibility Act and Small Business Regulatory Enforcement Fairness Act

The RFA requires federal agencies to determine whether their regulatory actions will have a significant economic impact on a substantial number of small entities, including businesses, non-profit organizations, and government. If an agency does not or cannot certify that a final regulation will not have a significant economic impact on a substantial number of small entities, it must prepare a regulatory flexibility analysis and examine alternatives to the regulation that may reduce adverse economic effects on significantly impacted small entities.

In 1996, Congress enacted SBREFA, which amended the RFA to strengthen its analytical and procedural requirements and to expedite congressional review of rules. SBREFA amended the RFA to reference the definition of a “small entity” found in the Small Business Act, which itself authorizes the Small Business Administration (SBA) to further define “small business” by regulation. The SBA’s small business definitions are codified at 13 CFR 121.601, and the SBA reviews and reissues these definitions every year. Exhibit 8-1 presents the small business size standards for the industries within the estimated universe of SPCC-regulated facilities. Size standards are given either in a revenue threshold (presented in thousands of dollars) or in an employee number standard (presented in number of employees). SBA defines a size standard as “the largest that a for-profit concern can be and still qualify as a small business for Federal Government programs,” and the size standards are generally calculated using the average annual receipts or the average employment of the entity.[157]

[150] 5 U.S.C. Sec. 603; 5 U.S.C. Sec. 604.
[151] 13 CFR part 121.
[152] 64 FR 43255, August 10, 1999.
[153] 65 FR 67249, November 9, 2000.
[154] 62 FR 19885; April 23, 1997.
[155] 66 FR 28355, May 22, 2001.
[156] 44 U.S.C. Sec. 3501.
[157] Definition taken from U.S. Small Business Administration, “Table of Small Business Size Standards Matched to North American Industry Classification System Codes,” March 11, 2008. Available at: http://www.sba.gov/idc/groups/public/documents/sba_homepage/serv_sstd_tablepdf.pdf.

In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives "which minimize any significant economic impact of the final rule on small entities."[158] Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule.

The final amendments to the SPCC rule would reduce the burden on small businesses to the extent that these businesses are eligible for reduced regulatory requirements offered to hot-mix asphalt facilities, production facilities, facilities that produce or process AFVO, Tier I qualified facilities, and others. Because the SPCC rule categorizes affected entities based on oil storage capacity while SBA defines small businesses based on the business's total number of employees or total annual revenue, EPA does not know the number of SPCC-regulated facilities that are also SBA-defined small businesses.[159] Nevertheless, given their resource constraints, owners and operators of small businesses are likely to take advantage of and benefit from the regulatory burden relief offered by the final amendments.[160]

Exhibit 8-1
SBA Revenue Thresholds and Employee Number Standards for Small Business by NAICS Code

Industry Description	NAICS	SBA Revenue Threshold (Thousands $)[1]	SBA Employee Number Standard (# employees)
Accommodation and Food Services	721-722	$6,500 - 19,000	
Animal Production	112	$750 - 11,500	
Arts Entertainment & Recreation	711-713	$6,500	
Chemical Manufacturing	325		500 – 1,000
Construction of Buildings	236	$31,000	
Crop Production	111	$750	
Education	611	$6,500 - 32,500	
Electric Utility Plants[2]	2211		
Finance and Insurance	52	$6,500 [3]	
Food Manufacturing	311,312		500 – 1,000
Fuel Oil Dealers	45431	$6,500 - 11,500	
Gasoline Stations with Convenience Stores	447110	$25,000	
Government[4]	92	Small business sizes are not established for the Public Administration sector.	
Heavy and Civil Engineering Construction	237	$6,500 - $31,000	
Hospitals and Other Health Care	621-624	$6,500 - 31,500	
Information[5]	51	$6,500 - 27,000	500 – 1,500
Manufacturing facilities using and storing AFVO	311,325		500 – 1,000

[158] 5 U.S.C. 603 and 604.

[159] According to the economic analysis of the 2002 SPCC final rule, EPA estimated that 94 percent or more of the total number of SPCC-regulated facilities were also SBA-defined small businesses. U.S. EPA, "Economic Analysis for the Final Revisions to the Oil Pollution Prevention Regulation (40 CFR Part 112)," May 2002.

[160] This assumption is consistent with an earlier study of PE certification cost impacts on small businesses conducted by the SBA: Jack Faucett Associates for SBA Office of Advocacy, June 2004, "Proposed Reforms to the SPCC Professional Engineer Certification Requirement: Designing a More Cost Effective Approach for Small Facilities."

Exhibit 8-1
SBA Revenue Thresholds and Employee Number Standards for Small Business by NAICS Code

Industry Description	NAICS	SBA Revenue Threshold (Thousands $)[1]	SBA Employee Number Standard (# employees)
Metal Manufacturing	331,332		500 – 1,500
Military Installations	928110	Small business sizes are not established for the Public Administration sector.	
Mining (Except Oil and Gas)	212		500
Oil and Gas Production	211111		500
Other Commercial	492,541,551,561-562	$3,500 - 32,500[6]	
Other Gasoline Stations	447190	$8,000	
Other Manufacturing	31-33		500 - 1500
Other Services	811-813	$4,500 - $23,000	
Petroleum Bulk Stations and Terminals	4247		100
Petroleum Refining and Related Industries	324		500 – 1,000
Pipelines	4861, 48691		1,500
Real Estate Rental and Leasing	531-533	$2,000 - 23,500	
Religious Organizations	813110	$6,500	
Retail Trade	441-446,448,451-454	$6,500 - 28,500	
Specialty Trade Contractors	238	$13,000	
Support Activities for Mining	213	$6,500[7]	
Transportation	481-488	$6,500 - 31,500[6]	
Warehousing and Storage	493	$23,500	
Wholesale Trade	42		100

1 Revenue thresholds given in a range indicate differing standards within the NAICS sector or subsector indicated.
2 A firm is small if, including its affiliates, it is primarily engaged in the generation, transmission, and/or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million megawatt hours.
3 Certain categories' revenue threshold is $165 million in assets. A financial institution's assets are determined by averaging the assets reported on its four quarterly financial statements for the preceding year.
4 The RFA defines a small government jurisdiction as the government of a city, county, state, town, school district, or special district with a population of less than 50,000.
5 Certain categories have revenue thresholds; others have employee number standards.
6 Certain categories have employee number standards of 150–1,500 rather than revenue standards.
7 Except 213111, Drilling Oil and Gas Wells, which has an employee number standard of 500.

Source: U.S. Small Business Administration, "Table of Small Business Size Standards Matched to North American Industry Classification System Codes," March 11, 2008. Available at: http://www.sba.gov/idc/groups/public/documents/sba_homepage/serv_sstd_tablepdf.pdf. Accessed July 2, 2008.

8.2 Executive Order 13132–Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the executive order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

The SPCC rule amendments do not have federalism implications. They would not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Under CWA section 311(o), states may impose additional requirements, including more stringent requirements, relating to the prevention of oil discharges to navigable waters and adjoining shorelines. EPA recognizes that some states have more stringent requirements (56 FR 54612, October 22, 1991). These rule amendments will not preempt state law or regulations. Thus, Executive Order 13132 does not apply to this action.

8.3 Executive Order 13175–Consultation and Coordination with Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination With Indian Tribal Governments" (59 FR 22951, November 6, 2000), directs federal agencies to consider whether a rule has tribal implications (i.e., whether it has substantial direct effects on tribal governments, on the relationship between the federal government and the Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes). These rule amendments do not have tribal implications, as specified in Executive Order 13175. These rule amendments would not significantly or uniquely affect communities of Indian trial governments. Thus, Executive Order 13175 does not apply to this action.

8.4 Executive Order 13045–Protection of Children from Environmental Health & Safety Risks

Executive Order 13045,"Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This rule amendment is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

8.5 Executive Order 13211–Actions that Significantly Affect Energy Supply, Distribution, or Use

Executive Order 13211, entitled Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (66 FR 28355, May 22, 2001), directs federal agencies to identify actions that will have a significant adverse energy effect. Adverse effects are defined as:

- Reductions in crude oil supply in excess of 10,000 barrels per day
- Reductions in fuel production in excess of 4,000 barrels per day
- Reductions in coal production in excess of 5 million tons per year
- Reductions in natural gas production in excess of 25 million cubic feet per year
- Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity
- Increases in energy use required by the regulatory action that exceed any of the thresholds above
- Increases in the cost of energy production in excess of 1 percent
- Increases in the cost of energy distribution in excess of 1 percent
- Other similarly adverse outcomes

The SPCC rule regulates owners and operators of facilities that comprise the energy sector – Oil and Gas Production, Electric Utility Companies, Petroleum Refineries, Petroleum Bulk Stations and Terminals, and owners and operators of facilities in alternate energy sectors including Biomass Refineries, Hydroelectric Power Plants, Wind Power Utilities, and Nuclear Powered Electric Utilities. Adverse effect on energy supply, distribution, and use would result if the rule imposes expenditures on the energy sector and these expenditures impact the profitability significantly. However, the final amendments to the SPCC rule reduce the burden on owners and operators of regulated facilities; EPA does not expect an adverse impact of the rule on energy supply, distribution, or use.

In response to EO 13211, EPA has circulated an analysis, which examines the impacts of the SPCC program as a whole on independent oil producers.[161] The analysis compared estimates of total SPCC compliance cost for production facilities, as amended in 2002, with a hypothetical "without SPCC" scenario using sales and expenditure data from Independent Petroleum Association of America (IPPA), Risk Management Association (RMA), and EPA's unit cost inventory. The analysis considered the impact only on marginal well operators, assuming that these would be most adversely affected.[162] The analysis concludes that small marginal well operators would not shut-in production because these facilities would exceed an 8 percent return on investment unless the real price of oil reaches at least $51 per barrel ($19 per barrel for the larger facilities). The U.S. Department of Energy (DOE) (Annual Energy Outlook 2008) does not foresee prices falling to that level for at least the next 22 years.[163] Since the SPCC

[161] "Assessment of SPCC Impacts of Oil Exploration and Production", July 2008, Office of Policy Economics and Innovation, U.S. EPA,

[162] Analysis was conducted for two scenarios: (1) a small U.S. marginal well operator running 8.30 marginal oil wells and (2) a small U.S. marginal well operator running 29 marginal oil wells.

[163] U.S. Department of Energy. June 2008. Annual Energy Outlook 2008. Available at: http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2008).pdf, accessed July 2, 2008.

program as a whole does have adverse energy impact, the final rule amendments would not adversely affect the industry because they lessen the burden of the SPCC requirements.

8.6 National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs federal agencies to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs federal agencies to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

The owner or operator of a facility subject to the SPCC rule has the flexibility to consider applicable industry standards in the development of an SPCC Plan, in accordance with good engineering practice. However, this rulemaking does not involve technical standards, as it does not set or incorporate by reference any one specific technical standard. Therefore, the NTTAA does not apply.

8.7 Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (PRA) (superseding the PRA of 1980) is implemented by OMB and requires that agencies submit a supporting statement to OMB for any information collection that solicits the same data from more than nine parties. The PRA seeks to ensure that federal agencies balance their need to collect information with the paperwork burden imposed on the public by the collection.

The definition of “information collection” includes activities required by regulations, such as permit development, monitoring, recordkeeping, and reporting. The term “burden” refers to the “time, effort, or financial resources” the public expends to provide information to or for a federal agency, or to otherwise fulfill statutory or regulatory requirements. Under PRA, the paperwork burden is measured in terms of annual time and financial resources the public devotes to meet one-time and recurring information requests (44 U.S.C. 3502(2); 5 C.F.R. 1320.3(b)).

Information collection activities may include:

- Reviewing rule requirements
- Using technology to collect, process, and disclose information
- Adjusting existing practices to comply with requirements
- Searching data sources

- Completing and reviewing the response
- Transmitting or disclosing information

Agencies must provide information to OMB on the parties affected, the annual reporting burden, and the annualized cost of responding to the information collection. The SPCC rule (40 CFR part 112) requires and establishes procedures for the preparation and implementation of SPCC Plans. As discussed in chapters above, owners and operators of regulated facilities must prepare SPCC Plans in accordance with good engineering practices and have them approved by a person with the authority to commit the resources necessary to implement the SPCC Plan. The Information Collection Request (ICR) Supporting Statement reports the estimated paperwork-related burden resulting from the SPCC rule and incorporates the amendments to the SPCC rule at 40 CFR part 112, expected to be finalized in fall 2008.[164] EPA estimates that approximately 640,000 facilities will incur paperwork-related burden in the first year of the ICR and the total reporting and recordkeeping burden for these facilities will amount to approximately 7.7 million hours in each year of this ICR. The Agency estimates that as a result of the final amendments to clarify and streamline certain SPCC requirements, the reporting and recordkeeping burden decreased by 1.7 million hours. The final rule amendments would reduce capital and operating and maintenance costs by approximately $44 million on an annualized basis.

8.8 Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. The overall effect of the action is to decrease the regulatory burden on facility owners or operators subject to its provisions.

8.9 Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to

[164] U.S. EPA, 2008, "Revision of Information Collection Request (ICR) for the Oil Pollution Prevention Regulation for Certain Facilities to Prepare and Maintain an Oil Spill Prevention, Control, and Countermeasure (SPCC) Plan."

publication of the rule in the Federal Register. A major rule cannot take effect until 60 days after it is published in the Federal Register. This action is a “major rule” as defined by 5 U.S.C. 804(2) because it will likely result in an annual effect on the economy of $100 million or more.

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Chapter 9

Key Limitations and Assumptions

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9 Key Limitations and Assumptions

According to Executive Order 12866, agencies are required to assess all costs and benefits of regulatory activities, including quantitative and qualitative measures. The EO also requires assessment of all benefits and costs including, but not limited to, those related to the environment, public health and safety, distributive impacts, and issues of equity.

This regulatory impact analysis estimated the reductions in compliance costs resulting from the 2008 final amendments to the SPCC rule. The Agency also considered whether the streamlined requirements in the final rule might increase the threat of discharges, with adverse consequences for the environment, human health, and welfare. EPA believes that the rule amendments protect the environment and, at the same time, provide the opportunity for regulated facilities to reduce the cost of SPCC compliance.

Many of the assumptions as well as the estimates of unit cost savings and the number of affected facilities presented in this RIA are inherently uncertain. EPA made the best use of the available data to make informed decisions regarding assumptions to be used in the analysis. To address major uncertainties involved in estimating the total cost savings from the 2008 final amendments to the SPCC rule, the Agency examined up to three scenarios for various components of the final amendments to provide a sensitivity approach to estimating the range of cost savings. Major limitations of the analysis are described in this chapter.

9.1 General Limitations and Assumptions

9.1.1 Estimated Number of Facilities

One of the main limitations of the regulatory analysis is EPA's lack of data on facilities regulated under the SPCC rule. The rule does not include a notification requirement, and, with certain exceptions, regulated entities do not need to submit any information to EPA. Without conducting a statistically valid survey, EPA is limited to data already collected by state or federal agencies or by proprietary sources. Such data are collected for diverse purposes and are not ideal for identifying SPCC-regulated facilities, as the data do not normally provide information on smaller storage tanks or non-petroleum oil. Therefore, evaluating regulatory changes involves some uncertainties because the collected data often omit portions of the regulated universe or lack sufficient detail to ascertain the impacts of changes in certain requirements. As discussed in detail in Section 9.5, additional uncertainty is introduced in the estimate for the SPCC-regulated facilities because of lack of information on how owners and operators would use the flexibility to define the facility boundaries for contiguous and non-contiguous parcels.

9.1.2 Estimated Cost of Compliance

Compliance costs incurred by owners and operators of facilities in the baseline depend not only on the volume of oil stored and handled, but also on the types of oil at a site, the number of tanks (and their volume), and the locations of the tanks across the site. Given a wide range of industries and facility sizes affected by the SPCC rule—as well as geographical and climatic

conditions that affect a facility's configuration and operation patterns—a realistic baseline against which regulatory changes are measured cannot be reliably determined. Therefore, uncertainty is involved in estimating the changes in compliance costs that could occur under the final regulatory actions.

The majority of the cost estimates used in the regulatory analysis were based on a detailed analysis by one professional engineering firm. The data provided by the firm represent information based on the experience of the Professional Engineers (PEs) employed by the firm, and are not representative, so they cannot be reliably extrapolated to a larger universe. In addition, the PEs were hesitant to provide "typical" costs when the costs of compliance depend significantly on site-specific factors, and emphasized that the cost estimates are illustrative. Ideally, a regulatory analysis would explicitly account for such variability in costs. However, in this analysis, EPA was unable to differentiate compliance costs due to the lack of information on site characteristics of the entities affected by the final amendments to the SPCC rule.

The cost of compliance is calculated for each of the amendments separately assuming that there are no changes in other aspects of the rule. Therefore, the analysis does not take into account the ways in which different amendments interact with each other and how they might reduce or increase the total cost. Consequently, the cost changes from each amendment cannot be added to get the aggregate effect of the final amendments. For example, final amendments provide the flexibility to qualified facilities to complete an SPCC template in lieu of a full Plan, but restrict the owners and operators of facilities choosing to complete a template to claim environmental equivalence. Another amendment exempts the production facilities from the secondary containment requirement around flowlines but requires owners and operators of production facilities to follow a more prescriptive flowline maintenance program. When calculating the cost saving from this amendment, EPA assumed that all facilities would claim environmental equivalence to their existing maintenance program. However, if EPA calculated the cost savings from this taking into account the amendment to the qualified facilities, the Agency would also have to take into account the fact that qualified facilities that choose to complete a template would not be able to claim environmental equivalence. This example highlights the type and extent of interactions that can exist across different amendments; the change in cost of compliance should be interpreted with this caveat.

It is important to note that since certain SPCC requirements may be similar in nature to those imposed by state regulations and facility owner/operators of many industries may follow specific industry standards, compliance activities and their associated costs cannot be fully attributed to the SPCC rule. Since regulations vary widely across states and industries, there is no single adjustment factor that could be developed to address this issue for the universe of regulated facilities. However, due to the lack of data on the extent to which facilities adopt industry standards, in this analysis the Agency estimated the baseline compliance costs and cost savings associated with the SPCC requirements without accounting for possible overlap with industry standards. EPA did take into account requirements imposed by state regulations that are similar to the SPCC requirements. As a result, the estimated compliance costs are likely to

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present an overestimate of the costs attributed to the SPCC rule. For details of the state overlap analysis, refer to Section 5.4 of this report.

9.2 Hot-mix Asphalt

Even though EPA never intended to regulate HMA containers, the Agency assumed that owners and operators of certain HMA facilities interpreted the 2002 rule as being applicable to these containers. A key information that EPA needed to estimate the cost savings for facilities with HMA containers is the fraction of HMA capacity as a percentage of total facility storage capacity. In the absence of other data, to determine this fraction, EPA relied on information from three SPCC Plans obtained from EPA regions, data presented in facility air permits and on HMA equipment sales Web pages. At both temporary and stationary plants, HMA accounted for approximately 34 percent of total storage, on average. Although these data do not represent a statistically valid sample, the Agency assumed that this estimate is applicable to HMA facilities of all sizes. As a result, the Agency estimated that HMA containers account for about 34 percent of total storage capacity at HMA facilities.

EPA assumed that affected facilities would move across size categories as a result of a reduced total capacity based on the estimates for the fraction of the total capacity that accounts for HMA containers. EPA estimated that 30 percent of Category I facilities would leave the SPCC universe, 30 percent of Category II facilities would become Category I, 30 percent of Category III facilities would become Category II, and 60 percent of Category IV facilities would become Category III. These estimates are inherently uncertain since they are based on a small number of observations from various data sources. However, there were no additional data available to improve the reliability of these estimates.

9.3 Farms

To estimate cost savings from exempting pesticide application equipment, EPA relied on two regional studies that conducted an economic analysis of pesticide application equipment. EPA used these studies to estimate the capacity of pesticide application equipment by different farm sizes and concluded that farms smaller than 500 acres would not have pesticide application equipment and would hire the services of custom applicator. Using agricultural census data,[165] EPA estimated the distribution of farms by farm sizes for different categories of farms. The key limitation of this analysis is that it relies on regional data to calculate cost savings for the United States and assumes that all owners and operators of farms mix oil with pesticide when using pesticide application equipment or other mixers.

9.4 Residential Heating Oil

EPA relied on data from DOE to estimate the average size of a heating oil container at households. To estimate the number of farms that have heating oil for residential use, EPA assumed that farms make a choice between only propane and heating oil and relied on DOE estimates on the percentage of households that use heating oil as compared to propane.

[165] USDA, 2002, 1997, and 1982 Census of Agriculture.

Further, EPA assumed that only family farms would have residences on a farm and used the USDA Family Farm Report to estimate that 98 percent of SPCC-regulated farms are family farms.[166] The same report provided estimates on the average number of residences on farm. Using these data, EPA estimated the total capacity of heating oil at farms. These estimates are based on several simplifying assumptions; therefore, this approach provides only an approximate estimate of the possible cost savings and is not expected to capture the wide variability in residential heating oil storage across the United States.

9.5 Definition of Facility

An important limitation to the estimate for the number of SPCC-regulated facilities is related to the clarification made in this final rule that non-contiguous parcels may be considered separate facilities. The baseline estimate for the SPCC-regulated universe does not take into account a possible change in behavior of facility owners and operators with respect to redefining their facility boundaries when the facility is located on multiple non-contiguous parcels. EPA recognizes that the baseline estimate for the number of SPCC-regulated facilities and the baseline compliance cost are likely to represent an overestimate. The Agency potentially overestimates the regulated universe because facility owners and operators might have redefined their boundaries and divided the parcels in order to reduce regulatory burden. This behavioral change would reduce the number of regulated facilities, leaving a certain number of facilities outside of the SPCC universe. Facilities in the following industries are expected to be most affected by this rule flexibility: farms, large oil production facilities, military bases, airports, and large universities.

9.6 Qualified Facilities

As described in Chapter 6, to identify facilities with total storage capacity of 10,000 gallons or less that had reportable discharges in the past three years, EPA used National Response Center (NRC) incident data. The main limitation of the NRC database for this analysis is the lack of information on the total amount of oil stored at a facility whose owner or operator reported an oil discharge. The Agency identified individual facilities whose owner or operator reported oil discharges of 10,000 gallons or less and used that figure as a proxy for the number of facilities with total storage capacity of 10,000 gallons or less. This approach likely results in overestimating the number of facilities with total storage capacity of 10,000 gallons or less that have had reportable discharges in the past three years, given that most facilities are not expected to discharge their total oil storage capacity. That is, a portion of the discharges of 10,000 gallons or less could have been from facilities with much larger oil storage capacities. Because it is not feasible to establish a relationship between the amount of oil discharged and total storage capacity at a facility, EPA examined three scenarios: 25 percent, 50 percent, and 75 percent of facilities that reported oil discharges of 10,000 gallons or less have total oil storage capacity of 10,000 gallons or less.

[166] USDA, 2005, Table 3, "Farm Size and Tenure by Farm Type, 2003" in the 2005 Family Farm Report. EPA assumed that only the medium to very large family farms are SPCC regulated. Available at: http://www.ers.usda.gov/publications/EIB12/EIB12c.pdf, accessed July 2, 2008.

9.7 Security

The main assumption associated with the cost impact analysis for the final rule changes to security requirements is that all existing facilities already have security measures in place as required by the 2002 SPCC rule and thus would not be affected by the rule change.

Owners and operators of facilities within many SPCC-regulated industries provide major security measures that are required by the SPCC rule due to normal industry practice designed to protect their facilities from vandalism and terrorism. These facilities often have a complex engineering structure, multiple oil storage and other flammable liquid containers, and site-specific technological processes at a facility that need to be protected. Therefore, not all owners and operators of new facilities would opt for the final rule change offered by the final amendments.

These security measures usually include full facility fencing, lighting, and automatic shut-off valves. Because some facility owners and operators would provide these measures during construction, EPA assumed that not all new facilities coming online would prefer the alternative option offered by the final rule. EPA's site visits suggested that facilities of the industries including but not limited to the following categories typically provide basic security measures: petroleum refineries, manufacturing, facilities handling AFVO, and asphalt production. Due to the lack of data on the number of facilities that have security measures in place as required by the SPCC regulations, EPA developed estimates for cost savings under the three scenarios: 50 percent (low), 75 percent (medium), and 100 percent (high) of all new facilities would use the flexibility in tailoring the security measures.

9.8 Animal Fats and Vegetable Oils (AFVO)

To estimate cost savings from the component of the final rule affecting facilities that handle AFVO, EPA assumed that a facility owner or operator would have integrity testing conducted on oil storage containers every 12 years on average. This assumption was based on the industry standards that require integrity testing to be performed on storage tanks every 10-15 years depending on the standard and the tank structure.

Another assumption EPA used in its analysis is that 93 percent of total oil storage capacity at a facility handling AFVO is devoted to food oil. This estimate was based on a limited number of SPCC Plans prepared by owners and operators of AFVO facilities and does not represent a statistically valid sample of facilities.

In addition, EPA did not have data on the number of facilities handling AFVO that would have storage containers with food oil qualified for the different integrity testing requirements. Since background research indicated that most AFVO facilities would have qualified containers, EPA developed three scenarios to evaluate a range of cost savings where 40 percent, 65 percent, and 90 percent of all facilities handling AFVO would have qualified containers.

The Agency also assumed that the burden associated with allowing the PE or owner/operator certifying an SPCC Plan to have flexibility to determine whether integrity testing is appropriate

for certain containers would be insignificant and would not introduce any additional cost to facility's owner or operator.

9.9 Oil and Gas Production Sector

Similar to the analyses of other elements of the final rule, EPA did not have numeric information on the number of production facilities that would be likely to make specific changes in their operating practices in response to the final rule. In particular, EPA did not have adequate information to identify the facilities that would have exempt produced water containers and those with non-exempt produced water containers. Consequently, EPA did not estimate the cost savings from this option. Further, the Agency does not know whether new oil production facilities coming into business would change their facility configuration and place all oil/water separators, including a heater-treater, inside the tank battery. Background research of the oil production industry and site visits suggest that it is common for existing facilities to have a heater-treater outside of the tank battery. Therefore, the Agency assumed that due to the specific characteristics of the oil and gas production industry, new facilities would continue building at least one heater-treater outside of the tank battery and therefore take advantage of the changed requirements of the final rule. Cost savings would result from the difference in cost for sized and general secondary containment.

9.10 Integrity Testing

To estimate cost savings from the component of the final rule that provides a more flexible integrity-testing requirement, EPA assumed that facilities are already using tailored integrity testing and claiming environmental equivalence. Therefore, the cost savings to owner and operators of storage facilities would be from not having to claim environmental equivalence. Furthermore, the Agency assumed that the cost of claiming environmental equivalence is the same across all size categories and not dependent on the number of containers that would qualify since the number of tanks should not affect the specific tank inspection standard that can be utilized.

9.11 Key Assumptions

EPA made four key assumptions in the analysis. First, the Agency assumed that cost minimization behavior applied to all owners and operators of facilities that qualify for reduced regulatory requirements, whereby all those affected would seek burden relief. Second, EPA assumed that owners and operators of existing SPCC-regulated facilities would forego compliance activities offered as alternatives to activities that required one-time initial investments because they would have already incurred the one-time cost. For example, an owner or operator of an existing Tier I facility qualified for reduced requirements under the final rule, who had an SPCC Plan in place, would not take advantage of the provided alternative to prepare a Plan template instead. Third, EPA assumed that compliance is nationally consistent despite variability in state regulations, political climate, and the distribution of affected facilities. Fourth, in accordance with EPA's guidelines to prepare economic analysis EPA assumed that all existing owners and operators of facilities are in complete compliance with the 2002 SPCC

rule.[167] It is important to note that insofar as certain owners/operators of facilities are not in compliance with the 2002 rule because of the compliance date extension, this assumption may imply that cost savings are an under estimate. In several cases, owners and operators would not incur cost savings if they were already in compliance with the 2002 SPCC rule. For example, existing facilities would not incur cost savings from a six month delay in Plan preparation and implementation. However, if facilities are not compliance with the 2002 rule because of the compliance date extension, these facilities would in fact incur cost savings implying that the cost savings are an underestimate. EPA did not account for compliance date extension when assuming full compliance with the 2002 SPCC rule as it is unclear which facilities would comply at the time of establishment of the facility (since the cost of building secondary containment might be cheaper at the time of initial construction of the facility) and those that would delay compliance till the compliance date of the rule. Furthermore, since the compliance dates were extended on several occasions it is unclear how many facilities may have come into compliance before new extension dates were announced.

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[167] U.S. Environmental Protection Agency (EPA). September 2000. "Guidelines for Preparing Economic Analyses".

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Chapter 10

Conclusions

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10 Conclusions

Under Executive Order 12866 (58 FR 51735, October 4, 1993), EPA must determine whether a regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. The EO defines "significant regulatory action" as one that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order

The 2008 final amendments to the SPCC rule would have an annual effect on the economy of $100 million or more and, therefore, would be considered economically significant. For such rules, the Executive Order requires an "assessment of the potential costs and benefits of the regulatory action, including an explanation of the manner in which the regulatory action is consistent with a statutory mandate and, to the extent permitted by law, promotes the President's priorities and avoids undue interference with state, local, and tribal governments in the exercise of their governmental functions."

EPA performed a regulatory impact analysis in accordance with Executive Order 12866 (and OMB Circular A-4)[168] requirements to the fullest extent possible; however, this report is not a comprehensive analysis of all benefits and costs. Many of the assumptions presented throughout this regulatory analysis are inherently uncertain, as are many of the estimates of unit cost savings and the number of affected facilities. EPA made the best use of the available data to make informed decisions regarding the assumptions used. To address major uncertainties involved in estimating the total cost savings from the final SPCC rule, the Agency examined up to three scenarios for various components of the final amendments to provide a sensitivity approach to estimating the range of cost savings.

The analyses followed the OMB circular A-4 guidance for regulatory analyses of benefits and costs, to the extent feasible given the data limitations. EPA believes the analytical technique and the results generated are useful, informative, and based on the best available information.

[168] OMB, September 17, 2003, OMB Circular A-4. Available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

Overall, the analysis concluded that the final SPCC amendments would result in significant compliance burden reduction for industry as compared to the 2002 rule, by reducing regulatory requirements for owners and operators of qualified facilities, oil production facilities, animal fats and vegetable oil facilities, facilities with asphalt cement containers, farms, owners and operators affected by flexibility in security and integrity testing requirements, and facility diagram requirements.[169] The oil production sector and farms would benefit from multiple components of the final rule. Farms would benefit from the new requirements for Tier I qualified facilities; amendments to the security, integrity testing, and facility diagram requirements; amendments to the definition of "loading/unloading rack"; and the exemption for single-family residential heating oil containers; in addition to the exemption of pesticide application equipment. The total annualized cost savings to farm owners and operators from these amendments are estimated at $13.3 million at the 7 percent discount rate.

The oil production sector would benefit from the new requirements for Tier I qualified facilities, revisions to the facility diagram requirements, and amendments to the definition of "loading/unloading rack," in addition to amendments specific to the oil production sector such as the six-month delay in preparation and implementation of SPCC Plans and the exemption of flow-through separation and treating equipment from sized secondary containment requirements. The total annualized cost savings to owners and operators of oil production facilities from all of the final amendments that affect this sector are estimated at $107 million at the 7 percent discount rate.

As summarized in Exhibit 10-1, at the 7 percent discount rate, the final amendments to the SPCC rule are expected to yield annualized cost savings of approximately $8 million from the exemption of hot-mix asphalt containers, $4 million from the changes for farms, $2 million from the exemption of residential heating oil containers, $3 million from the clarification to the facility diagram requirements, $51 million from the revision to the loading rack definition, $24 million from the streamlined requirements for Tier I qualified facilities, $9 million from the final amendments to the security requirements, $11 million from the amendments to integrity-testing requirements, $2 million for owners and operators of AFVO facilities, $24 million for owners and operators of production facilities from the six-month delay in SPCC Plan preparation and implementation, $7 million from the exemption of flow-through process vessels from sized secondary containment, $30 million for owners and operators of small production facilities with marginal wells, and less than $1 million from the exemption of underground oil storage tanks at nuclear power generation facilities.[170]

[169] The specific regulatory requirements for each of these rule components are discussed in Chapter 6 of this report.

[170] It is important to note that certain amendments have an effect across all the industries and so are not included in estimates of the costs savings from amendments that only affect a specific industry. Amendments with such effects across all industries include the proposed amendments to Tier I qualified facilities, definition of "facility," loading/unloading rack requirements, and security requirements.

Exhibit 10-1
Summary of Estimated Cost Savings Associated with the Final Amendments (2007$ Millions)

Rule Component/Scenario[1]	Annualized Cost Savings Discounted at 7%
Hot-mix Asphalt	
Exempt HMA containers	$8
Farms	
Exempt pesticide application equipment; applicability of mobile refueler requirements to farm nurse tanks	$4
Residential Heating Oil Containers	
Exempt residential heating oil containers	$2
Facility Definition	
Clarify the definition of "facility"	No cost impact
Facility Diagram	
Revise facility diagram requirement	$3
Loading/Unloading Racks[2]	
Define "loading/unloading rack"	$51
Tier I Qualified Facilities	
Provide streamlined requirements for Tier I qualified facilities	$24
General Secondary Containment	
Final revisions to the general secondary containment provision	No cost impact
General Secondary Containment for Non-Transportation-Related Tank Trucks	
Extend regulatory relief for mobile refuelers to non-transportation-related tank trucks	No cost impact
Security Requirements	
Revise security requirements[3]	$9
Integrity Testing	
Greater flexibility in the use of industry standards for integrity testing requirements	$11
Animal Fats and Vegetable Oil	
Amend integrity testing requirements for AFVO containers that meet certain criteria[4]	$2
Oil Production Facilities	
Six month delay for Plan preparation and implementation	$24
Exempt flowlines and gathering lines from secondary containment	No net cost impact
Flow-through process vessels	$7
Streamlined requirements for small production facilities with marginal wells	$30
Exempt produced water storage containers, piping and appurtenances	Less than $1
Man-Made Structures	
Consider manmade structures in determining SPCC rule applicability	No cost impact
Nuclear Power Stations	
Exempt underground oil storage tanks at nuclear power generation facilities	Less than $1
Wind turbines	
Clarify applicability of the rule to wind turbines used to produce electricity	No cost impact
Total	**$176**

1 Cost impacts are presented by rule component; impacts across industries are not separated out. See Section 6.2 for the aggregate cost effect on farms and Section 6.13 for the aggregate cost effect on the production sector.

2 Midpoint estimate (17% of oil production facilities, 50% of AFVO facilities, and 8% of medium and large farms affected). Cost savings might be higher or lower using different assumptions.

3 Midpoint estimate (50% of farms affected). Cost savings might be higher or lower using different assumptions.

4 Midpoint estimate (65% of facilities affected). Cost savings might be higher or lower using different assumptions.

The principal effect of the final amendments would be lower compliance costs for owners and operators of certain types of facilities and equipment, while being equally protective of the environment.

Although no statistically valid data exists to assess the extent or magnitude of non-compliance, inspections by EPA regions have found non-compliance in the SPCC regulated community. Even if facilities that should have been in compliance with SPCC requirements—dating back to 1973, if applicable—EPA assumed that they have already effectively incurred the costs of meeting SPCC requirements given the active status of the rule for these facilities. EPA has conducted a sensitivity analysis that considered partial compliance both in the baseline and after the final rule amendments.

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Acronyms and Abbreviations

AEO	Annual Energy Outlook
AFVO	Animal Fats and Vegetable Oils
API	American Petroleum Institute
AST	Aboveground storage tank
ASTM	American Society of Testing Materials
Bbl	Barrel
CBECS	Commercial Building Energy Consumption Survey
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
D&B	Dun & Bradstreet
DEC	Department of Environmental Conservation (New York State)
DEQ	Department of Environmental Quality (Virginia)
DLG	Digital Line Graph
DOE	U.S. Department of Energy
EIA	Energy Information Administration
EO	Executive Order
FERC	Federal Energy Regulatory Commission
FR	*Federal Register*
GAO	Government Accountability Office
GIS	Geographic Information System
HMA	Hot-mix asphalt
ICIS	Integrated Compliance Information System
IDEA	Integrated Data for Enforcement Analysis
IOGCC	Interstate Oil and Gas Compact Commission
KDH&E	Kansas Department of Health and the Environment
LP	Liquefied petroleum
MDE	Maryland Department of the Environment
MnPCA	Minnesota Pollution Control Agency
NAICS	North American Industry Classification System
NHD	National Hydrography Dataset
NPFC	National Pollution Fund Center
NRC	National Response Center
OCC	Oklahoma Corporation Commission
OFE	Oil-filled operating equipment
OMB	Office of Management and Budget
OPA	Oil Pollution Act
OPEI	Office of Policy, Economics and Innovation
OSLTF	Oil Spill Liability Trust Fund
OWS	Oil/water separator
PE	Professional Engineer(ing)
POLREP	Pollution report

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RIA	Regulatory Impact Analysis
SIC	Standard Industrial Classification
STI	Steel Tank Institute
SPCC	Spill Prevention, Control, and Countermeasure
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UST	Underground storage tank

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APPENDIX A

SPCC Facility Questionnaire

In order to collect additional information on characteristics of facilities regulated under the SPCC rule, EPA conducted five site visits in December 2006 and February 2007. The industries of the five facilities visited were crude petroleum and natural gas extraction, asphalt paving mixtures, chemical manufacturing, petroleum bulk stations and terminals, and petroleum refineries. This appendix summarizes the information collected using an SPCC Facility Questionnaire at these regulated facilities.

Industry: Crude Petroleum and Natural Gas Extraction (NAICS Code 211111)

Facility: Chevron, Humble Field

Location: Humble, TX

Site Visit Date: 2/1/2007

Individual Interviewed: Hector Cavazos

Title: Health Environmental and Safety Specialist Waste and Water Advisor

Mr. Cavazos is an advisor for multiple Chevron oil production facilities in several states (e.g., TX, WY, LA, CO).

Facility Overview

Oil Type: Crude Oil

Total Storage Capacity: 1,200 barrels

Storage Areas: Tank Battery, Oil/Water Separator (OWS)

The Humble Field facility was founded around 1915. It is a typical facility but on the smaller side; has one tank battery with three oil tanks.

Production Rate: 102 barrels of oil a day; 1,300 barrels of water; 1,400 barrels of oil and water total. The production rate has declined over the years, since the facility has been in operation for a long time.

Number of Wells: 20 producing (active) wells; 22 in total.

Tank Battery: One tank battery with three oil tanks of 400 barrels each and one produced water tank of 400 barrels.

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OWS: One OWS (gun barrel) of 750 barrels located in the central location within the tank battery and one heater/treater near the battery; another OWS near wellheads doing the first stage of separation.

Produced Water: Produced water is injected back into the ground using one injection well.

Loading/Unloading Area: One loading station where trucks come and go.

No loading rack present.

Underground Storage Tanks (USTs): No USTs on site.

Oil-Filled Operating Equipment (OFE): Transformers on site that belong to the electric company; Chevron owns a line from that electric company.

Flowlines: All flowlines are underground. Located across the oil field. Transport oil from oil wells to the tank battery.

Piping: Intra-facility gathering lines are aboveground. Located at the tank battery.

This oil field has multiple other facilities named after the individuals who own them, which are not summarized in this document (this is typical). They do not have any significant storage on site. Chevron pays royalties to these individuals. Chevron meters the amount of oil received from each well before it goes into the tank battery.

Facility Configuration

The facility is located on two sides of a major road near a river, San Jacinto, that is located three miles away. According to Mr. Cavazos, the overall area between the facility and the river is not sloped down and, in the event of an oil discharge, oil is not expected to reach the river.

SPCC Compliance Measures

Secondary Containment

The facility employs earthen walls that are impervious and sometimes corrugated panels as secondary containment for oil wells.

The lifespan of dirt secondary containment is a minimum of 10 years. Normally, dirt firewalls last a long time unless certain events such as hurricanes or large-scale storms cause damage or wash them out.

The tank battery has secondary containment made of dirt, sized by shell capacity, unless there is sufficient freeboard for precipitation.

For secondary containment around the loading area, the facility uses a dirt containment structure. It is shaped like an eyebrow (i.e., it does not go around the entire area and only

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protects the downstream area that is sloped down). According to the facility environmental specialist, in case of a discharge, the oil would be prevented from leaving the loading area and reaching waters.

Piping

Gathering lines are located aboveground. Those lines are inside the tank battery. They are wrapped or coated for protection. They also have cathodic protection. Some lines have injected chemicals to prevent corrosion. They are located inside the tank battery and thus have the secondary containment (i.e., the firewall).

Bulk Storage Tanks

Three stock tanks are located within the tank battery along with the produced water tank.

Exhibit A-1
Storage Tanks

Type of Equipment	Number of Units	Volume (bbl)	Containment Type
Aboveground Storage Tanks (ASTs)	4	1,210	Steel wall/earthen dike

Operational Equipment

Exhibit A-2
Operational Equipment

Type of Equipment	Number of Units	Volume (bbl)	Containment Type
Process Vessel	3	20.9	Steel wall/impracticable

Transfer Areas

The facility has one loading/unloading station. The facility does not have a loading rack. A truck comes to the tank battery to load from an oil tank to the truck. The frequency of the loading operation varies.

Oil/Water Separators

There are several stages of oil/water separation. First, oil is separated from produced water right near the well in the OWS and goes through a flowline to the tank battery. At the tank battery, oil goes through two or three more stages of separation. Two stages are performed in two vertical containers connected to each other. For very crude oil, an additional step is necessary to separate water – oil goes to the heater/treater, where further separation takes place.

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Important Findings

Oil production facilities vary significantly within states and across states due to such differences as varying facility configurations and geological and geographical differences.

One example of variation across production facilities is the oil/water separation process. Some facilities inject the water back into the ground, while others may dump it into the nearest body of water depending of the type of permit they have.

At this facility, secondary containment is provided for all oil storage tanks using 110 percent capacity of the largest tank. Containment for fired process vessels may create a fire and safety hazard due to the possible accumulation of a flammable/explosive vapor near the burner.

The facility is located on a large piece of land, and the surface is owned by another owner who grazes cattle on the land.

The facility is located on two sides of a road. Most oil wells are situated on one side, while the tank is located on the other side. Therefore, oil flowlines go under the road.

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Industry: Asphalt Paving Mixtures Made from Purchased Asphaltic Materials, Crushed and Broken Granite Mining and Quarrying (NAICS Codes 324121, 212313)

Facility: Pike Industries, Inc.

Location: Westbrook, ME

Site Visit Date: 2/13/2007

Individual Interviewed: John Koris, P.E./Jack McGrath

Title: Environmental Health and Safety Manager/Consultant

Facility Overview

Oil Types: Asphalt Cement, No. 2 Oil, Diesel, Spec Oil, Waste Oil, Lubricants

Total Storage Capacity: Approximately 69,000* gallons (including asphalt cement)

*This number varies depending on the number of lubricant drums located at the facility at a time.

Storage Areas

ASTs – Hot-Mix Asphalt Area, Yard

OFE – Maintenance Shop

This Westbrook, Maine facility has been in operation since the 1940s. Pike Industries acquired the facility in December 2005. This facility produces hot-mix asphalt (HMA). It produces specialty mixes on occasion. It consists of an HMA plant, crusher, and maintenance shop where paving vehicles are repaired and stored. There is also a rock quarry at this site.

This facility does not operate at full capacity year round. Paving season typically runs from mid-April through Thanksgiving. During the winter months, a small staff is kept for routine maintenance and corporate activities.

In the summer, this facility processes 1,000-3,000 tons of HMA a day. It produces approximately 220,000 tons a year.

Asphalt Cement, No. 2 Oil, Diesel, and Spec Oil are delivered by truck. These deliveries, particularly asphalt cement, may occur multiple times a day, depending on HMA demand.

Facility Configuration

The site is situated on approximately 95 acres in Westbrook, ME. Another company, Dragon Cement, leases a small portion of the site for a ready-mix concrete plant located adjacent to the

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railroad tracks, which bisect the site. Dragon is a separate entity and maintains its own SPCC Plan.

SPCC Compliance Measures

Secondary Containment

None.

Piping

Various types of piping are located in the hot-mix asphalt area. Some of the piping is located in and above the concrete secondary containment unit (walls and floor) that houses Asphalt Cement, No. 2 Oil, and Spec Oil ASTs. Secondary containment for piping that is not located within the secondary containment structure is impracticable. If a discharge from a pipe carrying oil occurs, sand and loaders are readily available to build a dike.

There is no buried or partially buried piping at this facility.

Bulk Storage Tanks

All storage tanks are in secondary containment. The Asphalt Cement, No. 2 Oil, and Spec Oil tanks are grouped in the same concrete secondary containment unit. The remaining tanks have steel or concrete sized secondary containment.

All bulk storage tanks are shop built. There are no underground or partially buried storage tanks at this facility.

Secondary containment for 55-gallon drums consists of the depressed shop floor and containment pallets.

Exhibit A-3
Storage Tanks

Type of Equipment	Number of Units	Volume (Gallons)	Containment Type
AST	12	66,000	Concrete/steel
Drum	Up to 20	55 each	Concrete floor/pallets

Oil-Filled Equipment

Various types of mobile equipment (trucks, loaders).

Transfer Area

No. 2 Oil and Spec Oil are transferred within the secondary containment unit. Operators delivering oil are responsible for oil safety.

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Effluent Treatment Facility

There is no effluent treatment facility at this facility.

Important Findings

Unlike a discharge from an oil tank, a discharge from a silo holding HMA would not pose a threat to the surrounding environment because HMA hardens as soon as it is exposed to ambient temperature. The same is true for asphalt cement. Like HMA, asphalt cement is stored in heated tanks. It begins to harden as soon as it is exposed to ambient temperatures.

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Industry: All Other Basic Organic Chemical Manufacturing, All Other Miscellaneous Chemical Product and Preparation Manufacturing (NAICS Codes 325199, 325998)

Facility: Rhodia

Location: Freeport, TX

Site Visit Date: 1/30/2007

Individual Interviewed: Mike Brower/Mike Chow

Title: Facility Operations Manager/Environmental Services Support

Facility Overview

Oil Types: Diesel Fuel, Lubricating Oil, Mineral Oil, Canopus®

Total Storage Capacity: 7,172 gallons

The Freeport, Texas facility manufactures three main types of materials: rare earth, fuel cell, and organic chemical intermediates. For example, the facility manufactures an additive for car paint. These materials are produced in processing units that are located in two areas of the plant. The facility stores and uses oils and fuels in small quantities. Most of the oil is stored for process equipment and transformers.

Storage Areas

ASTs (multiple locations): Utilities Diesel Storage, Maintenance Drum Storage Rack, Maintenance Warehouse, Tolonate Oil Storage, Warehouse Oil Storage

Facility Configuration

The Freeport, Texas facility is located in the area with the highest concentration of chemical manufacturing facilities in the world. It occupies 50 acres, including adjacent land, some of which is leased to another chemical production company.

SPCC Compliance Measures

Secondary Containment

An earthen berm surrounds the entire facility.

Piping

There is no partially buried or underground piping at this facility.

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Bulk Storage Tanks

All storage tanks have secondary containment. Two of the three diesel storage tanks have cement walls around the tanks. The third diesel tank has its own secondary containment.

Exhibit A-4
Storage Tanks

Type of Equipment	Number of Units	Volume (Gallons)	Containment Type
AST	3	2,050	Diked area
Drums	48	55 each	Metal pan/boxes/building

There are no partially buried or underground tanks at this facility.

Oil-Filled Equipment

Exhibit A-5
Oil-Filled Equipment

Type of Equipment	Number of Units	Volume (Gallons)	Containment Type
Transformers	6	2,100	Earthen berm
Capacitors	1 bank	30	Earthen berm
Crane	1	55	Earthen berm

Transfer Areas

During fuel transfer operations, a facility representative maintains constant contact with the transferring truck personnel to coordinate transfer operations and minimize potential for discharges.

Effluent Treatment Facility

The facility does not generate any untreated process effluent that is discharged from this facility. All effluent is treated within the facility. Storm water runoff is collected by a plant-wide drainage system that leads to a firewater pond or wastewater treatment unit. Any oil that discharges and is not contained would be captured this way. The treatment unit is visibly checked before it is disposed.

Important Findings

The amount of oil stored at this facility varies over time depending on the type of product they are making. For example, they stopped making a product and are now in the process of demolishing the associated manufacturing units.

Although this is a small facility in terms of capacity, storage tanks are not concentrated in one area. Therefore, separate containment structures are necessary. For example, drums located in

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the warehouse have secondary containment because the building serves as secondary containment.

The entire facility is surrounded by an earthen berm. Therefore, any discharge at this facility would ultimately be contained.

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Industry: Petroleum Bulk Stations and Terminals (NAICS Code 424710)

Facility: White Mountain Oil and Propane, Redstone Facility

Location: North Conway, NH

Site Visit Date: 12/21/2006

Individual Interviewed: Kirk Saunders

Title: Vice President

Facility Overview

Oil Types: Diesel, Oil and Kerosene

Total Storage Capacity: 275,805 gallons

Storage Areas: All tanks and equipment is located in one storage area.

The White Mountain Oil and Propane Company is 65 years old. It is a family business. The line of business is approximately two-thirds propane and one-third oil. The products are trucked in from Portland, Maine.

All storage tanks are vertical; 12 feet in diameter; 35 feet high; made of metal (steel), pre-manufactured in Pennsylvania.

Throughput = approximately 5 million gallons/year

Tank delivery = approximately 3,000 gallons

Customers are primarily residential (some businesses). The White Mountain Oil and Propane Company is the largest oil delivery company in the area; there are 17 other similar companies in the area.

The most common type of oil sold/delivered is fuel oil. They deliver within about a 50-75 mile radius.

They buy oil wholesale and sell it to the customers. They normally get approximately 9,000 gallons by truck; about 5-6 trucks/day = highest estimate for cold wintertime and 2 trucks/month = lowest estimate during summertime.

Facility Configuration

The facility is located in North Conway, NH. It is located off a small road and cannot be seen from the main street. This was intentional, to avoid wanderers from walking into the facility.

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SPCC Compliance Measures

Secondary Containment

None.

Piping

The majority of the piping is located in secondary containment. Piping associated with ASTs is housed in the same containment structure. Secondary containment for piping running from ASTs to the loading rack is located underground but accessible (iron grills cover it and can be removed for access).

Bulk Storage Tanks

All tanks are in secondary containment. They are all located in the same concrete secondary containment unit.

Exhibit A-6
Storage Tanks

Type of Equipment	# of Units	Volume (Gallons)	Containment Type
AST	9	270,000	Concrete

Oil/Water Separator

The OWS is part of the drainage system. In case of leakage, separated oil would travel to the OWS, and separated oil would be held in a container in the ground. The separated oil would need to be pumped from that container in the ground by a special service that would collect the oil.

Important Findings

This particular OWS does not need secondary containment because it serves as the secondary containment itself. The drainage system leads to the separator, and the container that holds the separated oil is a bulk storage container (i.e., secondary containment for the container that had a leak).

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Industry: Petroleum Refineries (NAICS Code 324110)

Facility: Sunoco Petroleum Refinery

Location: Philadelphia, PA

Site Visit Date: 2/6/2007

Individual interviewed: Scott Baker

Title: Supervisor, Environmental Engineering Department

Facility Overview

Oil Types: Crude oil refined into major industrial products (gasoline, home and industrial heating fuels, kerosene, diesel, jet fuel, and petrochemicals (benzene, cumene))

Throughput: 320,000 barrels per day (Point Breeze Processing Area and Girard Point Processing Area)

Storage Areas: Schuylkill River Tank Farm (Maximum Inventory Amount ≈ 3,900,000 bbl)

The facility was constructed in the late 1920s. The facility is on approximately 1,180 active acres and is made up of three areas; Point Breeze Processing Area, Girard Point Processing Area, and Schuylkill River Tank Farm. Originally, different companies owned these areas. Today, Sunoco Incorporated owns all three areas, and they are treated as one facility with one SPCC Plan.

Crude oil comes to the facility by pipelines. Most crude oil comes from North Africa.

Products from the facility go out by pipelines, trucks, and train.

This facility is the largest refinery on the East Coast by capacity.

Facility Configuration

The facility has three major units: two crude oil processing units, Girard Point and Point Breeze, and one storage unit, Schuylkill River Tank Farm. The tank farm is where petroleum products are stored in large volumes. The refinery also has steam and electric generation on site, a wastewater treatment unit, and truck loading facilities.

The facility is currently expanding one of the refining units (catalytic cracker portion), while installing pollution control equipment that would lower emissions into the air at the same time.

Crude oil units and the catalytic cracker units have feed tanks near them that feed oil into the unit. The facility also has one large dock and several smaller docks on site where barges dock and unload crude oil.

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SPCC Compliance Measures

Secondary Containment

None.

Piping

The facility has an enormous amount of piping. Crude oil and products go from tank to tank by pipes; oil, intermediate products, and final products come into and go out of the facility by pipes as well. There are pipe manifolds with a large number of valves, and numerous pipe ranks aboveground.

Pipes connecting tanks do not have secondary containment per se. They use other means to prevent oil discharges – any discharge would be contained in the earthen dike surrounding the facility, drain to the Waste Water Treatment Unit, and be diverted into a specially designated oil tank to be collected.

Two main reasons that pipes connecting tanks do not have specifically constructed secondary containment:

- It is impractical to provide any kind of dike system for piping because piping is present all around the facility, underground, aboveground, and elevated from the ground.
- Storage tanks present the biggest threat of oil discharges; therefore, the facility provides sized secondary containment for storage tanks but not piping.

Pipelines connecting tanks are under pressure, and they have automatic shutoff systems. If there were a leak, pressure in the piping system would go down, and a valve would automatically shut off.

Bulk Storage Tanks

All storage tanks on site are field-erected. The tanks are made of numerous steel plates that are welded together. Some tanks are insulated and some are not, depending on the substance they hold. For example, tanks with very crude oil need to be heated and insulated to prevent oil from thickening.

All storage tanks have dikes around them. Some tanks are in groups of two or three with dikes are built around the entire group of tanks; some tanks have individual dikes around them. All dikes are earthen, and sized to the capacity of the largest tank plus sufficient board for precipitation. Approximate height is 10-12 feet. In addition to dikes around the entire tank area, there are earthen berms between tanks to prevent oil from spreading around. For example, if there were a smaller discharge, it would be constrained from going further by the berm. Earthen berms are much lower than the dikes, similar to speed bumps in size and shape.

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Exhibit A-7
Storage Tanks

Type of Equipment	# of Units	Volume (bbl)	Containment Type
AST	≈ 225	≈12,000,000	Earthen dike/berms

Oil-Filled Equipment

There are a number of substations on site that have transformers. They are located outside. Mr. Baker emphasized that leaking from transformers is very rare because they are very reliable and robust. They are also checked on a daily basis.

Transfer Area

Vehicles entering the refinery are directed to specific truck routes. They must also obtain a work clearance. Concrete pads at the loading areas slope away from the tank truck to divert storm water.

Effluent Treatment Facility

The facility is designed so that all storm water and wastewater is treated at the wastewater treatment plant.

Important Findings

This facility is within a heavily regulated industry where SPCC requirements are the least burdensome compared to other federal and state regulations and industry standards. In the case of refineries in Pennsylvania, state rules are much more prescriptive than the SPCC rule or even industry standards. For example, the Pennsylvania law tells petroleum refineries exactly when to have oil storage tanks inspected (with dates), whereas SPCC or industry standards such as American Petroleum Institute standards and the Steel Tank Institute's SP001 do not specify in similar detail how to comply with the tank inspection requirement. Therefore, most costs cannot be attributed to the SPCC rule directly. Generally, if there were no SPCC rule in place, a typical petroleum refinery would have all the discharge prevention measures in place anyway.

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APPENDIX B

Sensitivity Analysis of Estimated Cost Savings

The main body of the regulatory impact analysis estimates the cost savings resulting from the final rule amendments compared to a baseline, which assumes full compliance with the SPCC rule requirements under 40 CFR part 112, as amended in 2002 (67 FR 47042). The cost savings may in fact be greater or lesser for reasons and limitations of the analysis explained in Chapter 6 in Volume I of the RIA.

EPA is aware of industry concerns regarding potential non-compliance among owners and operators of facilities of certain sizes or industry sectors. Although no statistically valid data exists to assess the extent or magnitude of such non-compliance, inspections by EPA regions have found non- compliance in the SPCC regulated community. Owners and operators of facilities that are complying with the baseline SPCC requirements would save money when some of those requirements are relaxed under the final rule amendments. Owners and operators of facilities that are not currently in compliance with 2002 SPCC rule requirements, however, have not incurred expenditures in the baseline, and thus would not accrue any savings as a result of this rule, unless they come into compliance during the analysis period. In response to comments from Office of Management and Budget (OMB), Government Accountability Office (GAO) and EPA, Office of Policy, Economics and Innovation (OPEI), EPA conducted the sensitivity analysis to examine the impact of various non-compliance assumptions. Since the SPCC rule does not have a notification requirement, EPA does not know the extent of non-compliance in the regulated community. The data that EPA has accumulated as part of its inspections does not provide accurate information on the extent of non compliance because the inspections are typically targeted towards non-compliant facilities and therefore this data has a significant upward bias on non compliance rates. Although EPA has some anecdotal evidence that majority of farms are non compliant, it does not have similar information for other industry sectors. Therefore, the Agency considered a range of compliance rates in the sensitivity analysis.

The purpose of this sensitivity analysis is two-fold. First, the analysis allows EPA to better understand the changes in cost savings associated with different rates of compliance with the 2002 SPCC rule in the baseline and post-rule (Scenario A). Second, the analysis examines changes in expenditures incurred by facilities that would come into compliance during the analysis period (Scenario B). Scenario A, Cost Savings Associated with Partial Compliance, presents cost savings estimates for owners and operators of facilities resulting from the final rule assuming partial (25 percent, 50 percent, or 75 percent) compliance with both the 2002 and final rules. Scenario B, Partial Compliance with Increase in Compliance, describes the estimated changes in net cost savings for owners and operators of facilities that would come into compliance during the analysis period and take advantage of the reduced requirements. In this scenario, EPA assumed partial compliance in the baseline during the analysis period and full compliance after the final amendments. EPA conducted this analysis for the oil production sector and farms: the two key sectors that are affected by the final rule amendments. EPA

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believes that there might be zero compliance with the SPCC rule in the farming community. Therefore, EPA considered partial compliance rates of 0 percent, 25 percent, and 50 percent for the farm sector. The compliance rate of the oil production sector is higher; DOE estimates that 67 percent of production facilities comply with the secondary containment requirement. Although compliance with secondary containment is not an indication of overall compliance with the SPCC requirements, EPA considered 67 percent in one of the scenarios; EPA considered partial compliance rates of 50 percent, 67 percent, and 75 percent for this sector.

Scenario A: Cost Savings Associated with Partial Compliance

This analysis examines the economic impact of the rule under three different partial compliance scenarios whereby 25 percent, 50 percent, or 75 percent of facilities are in compliance with the 2002 SPCC rule in the baseline and after the final amendments. In other words, these scenarios assume that 75 percent, 50 percent, or 25 percent of the facilities, respectively, are not in compliance with the current rule and would not incur any cost savings.

Under the partial compliance scenarios, anticipated cost savings would be less than the total cost savings presented in the regulatory impact analysis. The reason for less cost savings under those scenarios is that the fraction of SPCC-regulated facilities whose owners and operators are assumed to be in non-compliance would not be affected by the rule changes, and therefore, would not be able to lower their costs.

Therefore, under a 25 percent compliance scenario, only these 25 percent of owners and operators will have cost savings, which is equivalent to cost savings equal to 25 percent of the total cost savings calculated under the full compliance scenario; likewise for an assumed 50 percent and 75 percent compliance rate. The estimated cost savings under the three partial compliance scenarios are presented in Exhibit B-1.

Estimated impacts of the alternative compliance rates on the cost savings for the two elements of the final rule, farms and oil production facilities, are described in detail below.

<u>Farms</u>

Pesticide Application Equipment

Under the 25 percent scenario, EPA estimated that exempting pesticide application equipment would reduce compliance costs by approximately $0.89 million per year using either the 3 percent or the 7 percent discount rate. Under the 50 percent scenario, the compliance costs would decrease by approximately $1.78 million per year, discounted at either 3 percent or 7 percent. Under the 75 percent scenario, annual compliance costs would decrease by approximately $2.67 million per year, discounted at either 3 percent or 7 percent.

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Oil and Gas Production

SPCC Plan Preparation and Implementation Timeframe

EPA is extending the SPCC Plan preparation and implementation timeframe for the oil and gas production sector by either 6 or 12 months.

Under the 25 percent compliance scenario, EPA estimated that extending the Plan preparation and implementation by six months would reduce compliance costs by $6.02 million per year and $5.96 million per year, discounted at 3 percent and 7 percent, respectively. Under the 50 percent compliance scenario, the compliance costs would decrease by $12.0 million and $11.9 million, discounted at 3 percent and 7 percent, respectively. Under the 75 percent compliance scenario, annual compliance costs would decrease by $18.1 million and $17.9 million, discounted at 3 percent and 7 percent, respectively.

Intra-Facility Gathering Lines

Under all scenarios, EPA assumed that, in the baseline, all the facilities with flowlines or intra-facility gathering lines would choose impracticability determination, because it is less expensive than installing secondary containment. The facilities would incur cost savings from not having to demonstrate environmental equivalence, which EPA estimates would be offset by the increase in cost from a maintenance plan for flowlines and gathering lines. Therefore, in net, no facility would benefit from cost savings on secondary containment.

Flow-through Process Vessels

Under the 25 percent compliance scenario, EPA estimated that exempting sized secondary containment from separators and treatment installations would reduce compliance costs by $1.83 million per year and $1.81 million per year, discounted at 3 percent and 7 percent, respectively. Under the 50 percent compliance scenario, the compliance costs would decrease by $3.66 million per year and $3.62 million per year, discounted at 3 percent and 7 percent, respectively. Under the 75 percent compliance scenario, annual compliance costs would decrease by $5.48 million per year and $5.43 million per year, discounted at 3 percent and 7 percent, respectively.

Small Production Facilities

Under the 25 percent compliance scenario, EPA estimated that exempting small production facilities from PE certification requirements would reduce compliance costs by $7.56 million per year and $7.48 million per year, discounted at 3 percent and 7 percent, respectively. Under the 50 percent compliance scenario, the compliance costs would decrease by $15.1 million per year and $15.0 million per year, discounted at 3 percent and 7 percent, respectively. Under the 75 percent compliance scenario, annual compliance costs would decrease by $22.7 million per year and $22.4 million per year, discounted at 3 percent and 7 percent, respectively.

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Produced Water Containers

Since EPA did not have adequate data the cost savings from this amendment was not estimated.

Other Issues

Exhibit B-1 presents these estimates for Exempting Pesticide Application Equipment and for the Six-Month Delay, for Exempting Flow-through Process Vessels, and for Streamlined Requirements for Small Production Facilities, along with estimates for other final rule components.

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Exhibit B-1
Annualized Cost Savings Associated with the Final Rule under Partial Compliance Scenarios ($2007 Millions)

Final Rule Component[1]	Partial Compliance in the Baseline and after the Final Rule (25%, 50%, 75%)								
	25% Compliance			50% Compliance			75% Compliance		
	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted
Exempt Hot-Mix Asphalt Containers	$2.10	$2.09	$2.09	$4.19	$4.19	$4.18	$6.29	$6.28	$6.27
Exempt Pesticide Application Equipment for Farms	$0.890	$0.891	$0.892	$1.78	$1.78	$1.78	$2.67	$2.67	$2.68
Exempt Residential Heating Oil Containers	$0.577	$0.578	$0.579	$1.15	$1.16	$1.16	$1.73	$1.73	$1.74
Facility Diagram	$0.843	$0.838	$0.830	$1.69	$1.68	$1.66	$2.53	$2.51	$2.49
Loading/Unloading Racks[2]	$13.0	$12.9	$12.7	$25.9	$25.7	$25.4	$38.9	$38.6	$38.1
Tier I Qualified Facilities	$6.07	$6.03	$5.98	$12.1	$12.1	$12.0	$18.2	$18.1	$17.9
Security Requirements[3]	$2.35	$2.33	$2.31	$4.69	$4.66	$4.62	$7.04	$6.99	$6.93
Integrity Testing	$2.81	$2.79	$2.76	$5.61	$5.57	$5.53	$8.42	$8.36	$8.29
Animal Fats and Vegetable Oil (AFVO)[4]	$0.483	$0.482	$0.482	$0.966	$0.965	$0.963	$1.45	$1.45	$1.45
Oil Production: Six-Month Delay for Plan Preparation and Implementation	$6.06	$6.02	$5.96	$12.1	$12.0	$11.9	$18.2	$18.1	$17.9
Oil Production: Flow-through Process Vessels	$1.84	$1.83	$1.81	$3.68	$3.66	$3.62	$5.52	$5.48	$5.43
Oil Production: Streamlined Requirements for Small Production Facilities with Marginal Wells	$7.63	$7.56	$7.48	$15.3	$15.1	$15.0	$22.9	$22.7	$22.4
Exempt Completely Buried USTs at Nuclear Power Plants	$0.000507	$0.000484	$0.000452	$0.00101	$0.000968	$0.000904	$0.00152	$0.00145	$0.00136
Total	**$44.6**	**$44.3**	**$43.9**	**$89.2**	**$88.6**	**$87.8**	**$134**	**$133**	**$132**

1 Impacts are presented for preferred options by rule component; impacts across industries are not separated out.
2 Midpoint estimate (17% of oil production facilities, 50% of AFVO facilities, and 8% of medium and large farms affected). Cost savings might be higher or lower using different assumptions.
3 Midpoint estimate (50% of farms affected). Cost savings might be higher or lower using different assumptions.
4 Midpoint estimate (65% of facilities affected). Cost savings might be higher or lower using different assumptions.

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Scenario B: Cost Savings Associated with an Increase in Compliance

The SPCC 2008 final rule amendments may lead to increased compliance rates by owners and operators affected by the final rule amendments because of the lower cost of compliance associated with the reduced requirements and because of greater clarity in applicability of the amendments. This sensitivity analysis considers the impact of the rule on the owners and operators of oil production sector and farms, assuming partial compliance in the baseline and full compliance post-rule by facilities affected by the rule amendment. EPA believes that currently there might be zero compliance with the SPCC rule in the farming community, but the exact compliance rates are not known. Therefore, EPA analyzed alternative compliance rates of 0 percent, 25 percent, and 50 percent of farms affected by the rule amendments. The compliance rate of oil production sector is higher; DOE estimates that 67 percent of production facilities comply with the secondary containment requirement. Therefore, EPA analyzed alternative compliance rates of 50 percent, 67 percent, and 75 percent for facilities affected by the rule amendments in this sector.

Since the all facilities have until July 1, 2009 to come into compliance, EPA assumes full compliance starting in 2010. This is a simplifying assumption: in reality, the increase in compliance is likely to happen in a phased manner, and the rule amendments are not likely to result in full compliance. Compliance would depend on the implementation and communication schedule for the rule and is likely to vary across the regulated universe. However, the Agency did not have information to consider this variation, and assuming full compliance when the rule takes effect presents an analysis that is consistent with the intent of the rule.

Owners and operators of SPCC-regulated facilities affected by the rule amendments that are not currently in compliance with existing rule requirements but take advantage of the offered flexibility would incur the cost of coming into compliance net of the cost savings associated with the final rule amendments. Thus, EPA anticipates:

- Increase in expenditures due to the increase in number of facilities in compliance: while the rule is expected to reduce the per-facility cost of compliance, there are still costs associated with coming into compliance.
- Increase in benefits due to the reduction in oil discharge threat associated with the increase in number of facilities in compliance.
- The net benefit of the increase in compliance would be the benefits from the reduced threat of oil discharge minus the net cost the facilities incur to come into compliance with the SPCC requirements; where the net cost is the baseline cost of compliance minus the cost savings that result from the final rule amendments.

EPA estimated the cost of bringing all non-compliant facilities affected by the final rule amendments into compliance with the SPCC rule, the aggregate cost savings to all affected facilities associated with the final rule amendments, and the resulting cost of compliance post-rule for farms and the oil production sector. EPA could not, however, directly estimate the

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additional benefits of reduced threat of oil discharge due to the increase in number of facilities in compliance. There are insufficient data to quantify the reduction in threat of oil discharges and the resulting benefits from avoided discharge response costs, and avoided damages to the environment and human health.

The remainder of the appendix presents the net changes in compliance cost.

Compliance Cost

Farms

The baseline cost of compliance with the 2002 SPCC rule is discussed in Chapter 6 and is presented in Exhibit B-2. EPA has estimated the 2002 SPCC baseline compliance cost for farms (see Exhibit B-2). EPA is amending the SPCC rule to further differentiate certain requirements that apply to farms:

- Exempt pesticide application equipment from SPCC applicability
- Clarify in the Preamble that the SPCC definition of mobile refuelers includes nurse tanks used on farms.

In addition to the farm-specific amendments discussed above, EPA is also making other amendments to the SPCC rule that, although they apply to the SPCC-regulated universe as a whole, would represent significant cost savings for the farm sector in particular. Farms would benefit from the new requirements for Tier I qualified facilities, amendments to the definition of "facility," amendments to the security, integrity testing, facility diagram requirements, amendments to the definition of "loading/unloading rack," and the exemption for single-family residential heating oil containers, in addition to the exemption of pesticide application equipment. The total cost savings to farm owners and operators from these amendments in aggregate are estimated at $13.3 million and $13.3 million, at the 3 percent and 7 percent discount rate, respectively (see Chapter 6 in Volume I).

The cost of compliance with the SPCC rule after the 2008 final rule amendments is equal to the baseline cost of compliance minus these total cost savings (Exhibit B-2). Thus, under the 0 percent compliance rate scenario, EPA estimated that the net change in compliance cost for all the affected farms to come into compliance with the SPCC rule is $376 million per year and $362 million per year, discounted at 3 percent and 7 percent, respectively. Under the 25 percent baseline compliance rate scenario, 75 percent of farms affected by the amendments would come into compliance under the final rule with a net change in compliance cost of $279 million and $269 million, discounted at 3 percent and 7 percent. Under the 50 percent baseline compliance rate, 50 percent of farms affected by the final rule amendments would come into compliance under the final rule with a net change in compliance cost of $182 million and $175 million, discounted at 3 percent and 7 percent.

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Oil Production Sector

The baseline cost of compliance with the 2002 SPCC rule is discussed in Chapter 6 and is presented in Exhibit B-2. EPA has estimated the 2002 SPCC baseline compliance cost for the oil production sector (see Exhibit B-2). EPA is amending the SPCC rule to further streamline SPCC requirements as they apply to this sector. In particular, EPA is finalizing the following modifications: modification of the definition of production facility, consistent with the final amendments to the definition of facility; for production facilities that become operational after July 1, 2009, extension of the timeframe by which a facility must prepare and implement an SPCC Plan; exemption of flowlines and intra-facility gathering lines from secondary containment requirements; in an effort to provide consistent rule application, exemption of flow-through process vessels at production facilities from sized secondary containment requirements; streamlined requirements for small production facilities with marginal wells; and exemption of produced water storage containers that meet certain requirements.

In addition, the oil production sector would benefit from the new requirements for Tier I qualified facilities, revisions to the facility diagram requirements, and amendments to the definition of "loading/unloading rack," in addition to amendments specific to the oil production sector such as the six-month delay in preparation and implementation of SPCC Plans and the exemption of flow-through process vessels from sized secondary containment requirements. Thus, the total annualized savings to owners and operators of oil production facilities from *all* of the final amendments that affect this sector are estimated at $117 million and $116 million at the 3 percent and 7 percent discount rate, respectively (see Chapter 6 in Volume I).

The cost of compliance with the SPCC rule after the 2008 final rule amendments is equal to the baseline cost of compliance minus these total cost savings (Exhibit B-2). Under the 75 percent baseline compliance rate scenario, EPA estimated that the net change in compliance cost for all the affected production facilities to come into compliance with the SPCC rule is $95 million per year and $92 million per year, discounted at 3 percent and 7 percent. Under the 67 percent baseline compliance rate assumption, the net change in compliance cost to bring the remaining 33 percent into compliance would be $163 million and $157 million, discounted at 3 percent and 7 percent. Under the 50 percent baseline compliance scenario, the net change in compliance cost to bring the remaining 50 percent into compliance would be $308 million and $296 million, discounted at 3 percent and 7 percent.

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Exhibit B-2
Annualized Net Cost of Compliance Associated with the Final Rule under Increased Compliance Scenarios ($2007 Millions) [1]

Industry Sector	Partial Compliance in the Baseline and Full Compliance after the Final Rule								
	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted	Not Discounted	3% Discounted	7% Discounted
Oil Production Sector									
	50% Baseline Compliance			**67% Baseline Compliance**			**75% Baseline Compliance**		
Baseline Cost of Compliance with SPCC Rule (2002)	$629	$611	$588	$415	$403	$388	$315	$306	$294
Cost Savings from Final Rule Amendments (2008)	$312	$303	$292	$247	$240	$231	$216	$210	$202
Net Cost of Compliance with SPCC	$317	$308	$296	$168	$163	$157	$98	$95	$92
Farms									
	0% Baseline Compliance			**25% Baseline Compliance**			**50% Baseline Compliance**		
Baseline Cost of Compliance with SPCC Rule (2002)	$983	$954	$918	$737	$716	$689	$491	$477	$459
Cost Savings from Final Rule Amendments (2008)	$595	$578	$556	$450	$436	$420	$304	$295	$284
Net Cost of Compliance with SPCC	$388	$376	$362	$288	$279	$269	$187	$182	$175

[1] Excludes the cost savings from the 2006 proposed amendments. Estimates based on a 10-year average of the number facilities, rather than the estimate for each year of analysis.

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APPENDIX C

Data Sources Used to Estimate the Universe of SPCC-Regulated Facilities

EPA used eight state databases to estimate SPCC-regulated facilities in 17 of the 30 industry sectors studied in the analysis: chemical manufacturing; food manufacturing; metal manufacturing; other manufacturing; real estate rental and leasing; retail trade; contract construction; wholesale trade; other commercial; transportation; arts, entertainment, and recreation; other services (except public administration); hospitals and other health care; accommodation and food services; information finance and insurance; mining; and warehousing and storage. Although state databases were the primary data source for the majority of industry sectors, federal and proprietary data were available and used to estimate the number of facilities in the sectors with the most facilities regulated by the SPCC rule: farms; oil and gas production; petroleum bulk stations and terminals, fuel oil dealers, pipelines, and petroleum refinery and related industries; electric utilities; airports; military installations; animal fats and vegetable oils; and education facilities, government establishments, and religious organizations. This appendix describes the data sources used to estimate the universe of facilities regulated by the SPCC rule, including state databases, proprietary databases, and federal databases.

State Databases

<u>Florida</u>

Florida Department of Environmental Protection, Storage Tank Facility Information–All Locations and Tank Information

The Florida Department of Environmental Protection's Storage Tank Program regulates underground storage tanks (USTs) larger than 110 gallons and aboveground storage tanks (ASTs) with capacities of more than 550 gallons storing petroleum products and hazardous substances. The regulations apply only to owners and operators of non-residential facilities. USTs and ASTs with a capacity of less than 30,000 gallons that store heating oil for use on the premises where they are stored are exempt from regulation. Tanks storing asphalt or asphalt products, tanks directly related to oil and gas production and gathering, pipeline facilities, loading racks, oil-filled operational and electrical equipment, and flow-through process tanks are not regulated. Mobile tanks and tanks constructed prior to 1998 located within a vault or building are also exempt. The data include information on tank capacity, the material stored, and the facility name and address. Facilities are classified into 17 types.

<u>Kansas</u>

Kansas Department of Health and the Environment (KDH&E), Permitted Tanks Database

KDH&E requires owners of petroleum storage tanks to apply for permits. For ASTs and USTs in farm and residential use, tanks larger than 1,100 gallons are regulated. For other tanks, the minimum size for which a permit is required is 660 gallons for ASTs and 110 gallons for USTs.

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The database contains records of 6,445 USTs at 2,375 facilities and 9,576 ASTs at 3,362 facilities. It includes facility names and addresses, and tank status, capacity, and contents.

Maryland

Maryland Department of the Environment (MDE), AST Oil Operations Database

The MDE Oil Control Program regulates petroleum storage tanks. Registration is required for ASTs at facilities with at least 10,000 gallons of storage capacity or at least 1,000 gallons of storage capacity for used oil. The state provides data that include facility name and address, tank capacity, substance stored, and the facility's four-digit U.S. Standard Industrial Classification (SIC) code. Only tanks currently in use or temporarily closed are included in the database used in the analysis. The Maryland AST database contains records of 6,330 active tanks at 691 facilities.

Maryland Department of the Environment UST Oil Operations Database

Owners of USTs that store petroleum products are required to register their tanks. Farm and residential USTs smaller than 1,100 gallons are exempt. Facility name and address, tank capacity, and substance stored are listed for each tank. The database includes only tanks that are currently in use or temporarily closed. The facilities are grouped into 23 categories, with 29 percent designated as "other" or "not listed." The database includes 13,015 USTs at 5,656 facilities.

This database was used in EPA's 1991 facilities study. The advantage of using Maryland's databases is that they record information on SIC codes or industry groups. The main disadvantage of this database is that it does not contain information on facilities that store 10,000 gallons or less of oil.

Minnesota

Minnesota Pollution Control Agency (MnPCA), Tanks Database

The MnPCA's Tanks Database covers both ASTs and USTs. Registration is required for ASTs larger than 500 gallons and USTs covered by the EPA UST program.[1] The requirements exempt farm and residential ASTs and USTs smaller than 1,100 gallons storing motor fuel for non-commercial purposes and those smaller than 1,100 gallons storing heating oil for consumption use. For each tank, the database provides the facility name and address, tank capacity, and tank contents. Facilities are also designated as one of 35 facility categories. Only active and temporarily closed tanks are included in the 12,799 facilities in the database. Of

[1] The EPA UST program applies to USTs larger than 110 gallons that store petroleum or hazardous products identified by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Certain tanks are exempt from UST program regulation. These exemptions include farm and residential tanks smaller than 1,100 gallons storing motor fuel used for non-commercial purposes, tanks storing heating oil used on the premises where it is stored, tanks on or above the floor of underground areas such as basements or tunnels, flow-through process tanks, and emergency spill and overfill tanks. Partially buried tanks with at least 10 percent of their volume below ground level are defined as USTs under this program.

these, 6,014 facilities have ASTs and 7,569 have USTs. The database shows 13,706 active USTs and 22,857 active ASTs at these facilities.

As with the other state databases, the main disadvantage of this database is that it covers only petroleum and related oils. It does not include SIC or North American Industry Classification System (NAICS) codes, but there are 35 broad industry sectors assigned to the facilities.

New York

New York State Department of Environmental Conservation (DEC), Petroleum Bulk Storage Database

The Petroleum Bulk Storage Program regulates petroleum storage at facilities with at least 1,100 gallons of storage capacity. Information on regulated tanks is contained in the Petroleum Bulk Storage Database. The database contains information on facility name and address and tank status, capacity, and contents for 65,534 tanks at 55,757 facilities.

New York State DEC, Major Oil Storage Facilities Database

The Major Oil Storage Facilities Program regulates petroleum terminals and transport vessels operating in New York waters, with a total storage capacity of 400,000 gallons or more. The database contains information on 9,181 tanks at major oil storage facilities. Information includes facility name and address, tank capacity, tank contents, and tank status.

Oklahoma

Oklahoma Corporation Commission (OCC), Petroleum Storage Tank Database

The Petroleum Storage Tank Database contains registration information on USTs and ASTs. For residential and non-commercial agricultural use, USTs more than 1,100 gallons in capacity must be registered. For all other uses, owners of tanks larger than 110 gallons must register their tanks. The only ASTs that require registration are those at airports, marinas, retail facilities, water and sewage treatment plants, emergency generators at hospitals, commercial facilities, and bulk plants. Tanks larger than 110 gallons must be registered, except at bulk plants and commercial facilities (where tanks of any size must be registered). The OCC database divides tanks into eight categories of public facilities and eight categories of private facilities.

The coverage of the Oklahoma AST database is limited. This database could be useful, but EPA is not able to examine the number of facilities or types of information included. For security reasons, this database is not normally available to the public and requires a formal request to obtain it.

Virginia

Virginia Department of Environmental Quality (DEQ), Registered Tanks Database

The Virginia DEQ maintains a database of ASTs and USTs storing petroleum products. ASTs over 660 gallons or facilities with a total capacity over 1,320 gallons are required to register. For

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USTs, the database covers tanks subject to regulation under the EPA UST program. Facility name and address, tank status, tank capacity, and tank contents are included. Partially buried tanks with at least 10 percent of their volume below ground level are defined as USTs. Facilities are classified into one of 21 industry categories. The database covers 25,769 facilities, of which 12,804 have tanks that are currently in use or temporarily closed. Approximately 3,000 facilities have ASTs, and 10,490 have USTs.

Wisconsin

Wisconsin Department of Commerce, Storage Tank Database

Wisconsin's Storage Tank Database contains information on registered ASTs and USTs in the state. Registration is required for tanks storing petroleum products and CERCLA hazardous substances. All USTs larger than 60 gallons must register. The size threshold for ASTs is 1,100 gallons for farm and residential tanks and 110 gallons for other ASTs. The database includes facility name and address, and tank status, capacity, and content. The database includes 70,549 tanks that are currently in use.

Other Databases

2002, 1997, and 1992 Economic Census, United States

The Economic Census covers nearly all of the U.S. economy in the basic collection of establishment statistics. The Economic Census measures activity during each calendar year, 1992, 1997, and 2002.

Economic Census statistics are collected and published primarily by “establishment.” An establishment is a business or industrial unit at a single physical location that produces or distributes goods or performs services; for example, a single store or factory. Many companies own or control more than one establishment, and those establishments may be located in different geographic areas and may be engaged in different kinds of business.

The number of establishments for various industry sectors was used in this analysis. The Economic Census does not generally include governmental organizations, even when their primary activity would be classified in industries covered by the census. Exceptions have been made to include certain governmental activities in the Economic Census, such as hospitals, government-owned liquor stores, university publishers, and Federal Reserve Banks.

2002, 1997 and 1982 Census of Agriculture and U.S. Department of Agriculture (USDA) National Agricultural Statistics Service

EPA used Census of Agriculture data on production expenses related to petroleum-related purchases from 2002 and 1997, and on diesel storage data from 1982 to estimate the number of farms. EPA also used Census of Agriculture data on the number of farms reported from 1996 to 2005.

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The National Agricultural Statistics Service collects census data from a list of all known potential agriculture operators. This list is assembled from previous census records, state and federal agencies, trade associations, and similar organizations that could be identified as associated with agriculture. However, the list is not complete. Producers go in and out of business every day, and many small operations are never identified. The coverage adjustments are generated, and therefore most accurate, at the state level.

Commercial Building Energy Consumption Survey (CBECS), 1995 and 2003

CBECS is a national sample survey that collects data on energy-related building characteristics, and energy consumption and expenditures, including information on fuel oil used and stored (this activity was discontinued after 1995) for commercial buildings in the United States. CBECS was first conducted in 1979; the eighth, and most recent survey, was conducted in 2003. CBECS is currently conducted every four years.

Form EIA-906 Monthly Utility Power Plant Database, 2000

EPA used summary statistics on oil capacity at electric utilities from the Energy Information Administration (EIA). The data are compiled by EIA based on the stocks information reported on Form EIA-906, "Power Plant Report" and EIA-920, "Combined Heat and Power Plant Report." These forms collect data from electric power generators with at least 1 megawatt of total plant nameplate capacity. Reporting plants are either operating or in a standby mode from which they can be quickly returned to service. Stocks are estimated by EIA for non-respondents based on the historical stocks information for those plants.

The main limitation of these data is that the EIA does not collect data on power plants with less than 1 megawatt of nameplate capacity. The data used are for 2003, the most recent year for which EIA has final data.

EIA, U.S. Department of Energy

The Energy Information Administration (EIA) of the U.S. Department of Energy provides official energy statistics from the U.S. government. The EIA reports estimates for the number of oil wells in the country. EIA databases contain historical data on oil and gas wells, including marginal wells for 1919 through 2004. EIA compiled the database using government and commercial data sources. In its Annual Energy Outlook, EIA reports forecasts for total oil production data through 2030.

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APPENDIX D

Determining Industry Categories for SPCC-Regulated Facilities Based on the Dun & Bradstreet Database

In order to obtain industry information for facilities in the eight state databases used in the SPCC universe study, EPA matched facility names and addresses contained within the state databases with the Dun & Bradstreet (D&B) Market Spectrum database.[2] The matching exercise involved an automated, "fuzzy matching" process developed by Abt Associates Inc. Each pair of records identified by the fuzzy matching process as a possible match was visually inspected to confirm or reject the match. In some cases, manual matching using additional information was also performed. Once a match was determined, the industry category for the D&B record was assigned to the matched record in the state database.

The eight state databases used in the analysis include records on 140,438 facilities. Almost one-third of the total records were matched through a combination of fuzzy matching and manual matching, as shown in Exhibit D-1. Due to resource constraints, manual matching for each record was not possible, as manual matching takes approximately one minute per record. The following sections describe the methodology in detail.

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[2] D&B Market Spectrum is a suite of related products and services that allows companies to combine their customer data and third-party data with D&B's global database, resulting in the most targeted, accurate, and complete database of businesses in the United States.

Exhibit D-1
Percentage of Matched Facilities Achieved by Automated and Manual Matching

State	Total Number of Records	Percentage Matched	Scale Factor[1]
Florida	24,600	35%	2.9
Kansas	3,060	81%	1.2
Maryland	6,430	53%	1.9
Minnesota	6,930	43%	2.4
New York	38,800	28%	3.6
Oklahoma	1,190	45%	2.3
Virginia	11,900	36%	2.8
Wisconsin	47,500	21%	4.8
Total	**140,000**	**31%**	**3.3**

[1] The scale factor is calculated as one divided by the percentage of matched facilities, and reflects the proportion of facilities that matched relative to the total number of SPCC-regulated facilities from the state databases. The number of matched facilities is multiplied by the scale factor to estimate the total number of SPCC-regulated facilities for each industry within each state database. By using the scale factor, EPA assumed that the distribution of facilities across industries is identical for matched and unmatched facilities. To the extent that this assumption is incorrect, the estimate of total facilities per industry in each state may be an over- or underestimate.

Fuzzy Matching

Abt Associates Inc. matched facilities from the state databases to industries reported in the D&B Market Spectrum data using the fuzzy matching methodology. The term “fuzzy” refers to logical systems that do not require exact equality of two values in order to classify the two values as equal. The matching procedure assigns D&B records to a facility in a state database even if some identifying fields do not match exactly. This approach accommodates misspelled words and inconsistencies in how a facility owner or operator reports its identifying information to different sources, and how the information reported by the facility owner or operator is stored in different databases. For example, “Tosco Santa Maria Refinery” and “Tosco Refining Co. Santa Maria Facility” refer to the same facility despite the differences in presentation. The fuzzy matching algorithm identifies a possible match based on similarities in two datasets, rather than exact equality in the field.

Standardization Procedure as Part of Record Linking

Prior to performing fuzzy matching, Abt Associates standardized the variables (names, addresses, and ZIP codes) used by the matching program to link records from the two datasets in order to maximize successful matches. To compensate for common typographical errors and abbreviations, Abt Associates developed a function to normalize (or standardize) the data. With appropriate standardization, comparison of corresponding components of information becomes

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more effective. The standardization procedure also corrects common spelling errors made in alphanumeric strings, as well as inconsistencies in data. For instance, “Ahsland” is replaced with “Ashland.”

In addition to the functions described above, Abt Associates undertook several other steps to normalize variables. For example, Abt Associates converted all characters to uppercase and replaced special characters (/ \ , . _ - + =, etc.) with blanks. Abt Associates also removed spaces by shifting characters to the left. The cleaned datasets were used as input files to the fuzzy matching program.

Matching Procedure

The first step of the fuzzy matching process is to read one record from one dataset and hold it open while reading through the other dataset to look for potential matches. Every combination of records from the two datasets receives a matching score. The overall score represents the weighted average of name, address, and ZIP code scores. A score of zero means that no characters in common occur within the required distance from each other in the compared records from two datasets. A score of 1.00 implies that all characters of a string in one dataset are in exactly the same order as a string from another dataset. As a last step, the program selects the best match for a given facility and reports matches with a score greater than a threshold value of 0.75.

The decision rule for identifying matched facilities is as follows:

- Records with a score greater than 0.9 are automatically defined as perfect matches, as confirmed through visual inspection.
- Records with a score between 0.75 and 0.9 are designated as a possible match. Possible matches are pairs of facilities for which identifying information is not sufficient to determine whether a pair is a match or a non-match. These pairs of facilities are subject to the manual matching process in which Abt Associates identified matches using additional information on the facility. If discrepancies occurred in the company’s name, Abt Associates completed a search on the firm’s acquisitions, merges, and name changes. When address information contained coordinates in one of the matched records, Abt Associates obtained the facility’s physical address based on the information provided using mapping techniques.
- Records with the score below 0.75 are automatically defined as non-matches. Visual inspection of facilities matched with a score below 0.75 showed an insignificant percentage of records that could be matched to the D&B data.

Abt Associates ran the comparing procedure in both directions (i.e., left to right and right to left). This makes it possible to disregard irrelevant (for matching purposes) information that often appears in the beginning or end of a string. Left-to-right comparison of some records may not yield a high score due to the large distance between common characters in the two strings.

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Under the backwards comparison on such records, all the common characters might be found in precisely the same positions, and the string combination would receive a high matching score.

Abt Associates performed the string comparison for each of the three variables used in the matching procedure: name, address, and ZIP code. If all three fields participated in the matching process, Abt Associates calculated an overall score as 1/3*Name Score + 1/3*Street Address Score + 1/3*ZIP Code Score. The primary reason for assigning equal weights was the lack of justification for giving a higher significance to strings in one of the datasets over another. Where ZIP code information was missing, Abt Associates matched records on the basis of name and address, assigning equal weights to each.

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APPENDIX E

SPCC Universe Estimation Using Industry-Specific Data Sources

EPA used industry-specific data and methodologies to estimate the number of SPCC-regulated facilities in the following industry sectors:

- Farms
- Petroleum bulk station and terminals; fuel oil dealers; pipelines; and petroleum refinery and related industries
- Oil production facilities
- Electric utilities
- Military installations
- The animal fats and vegetable oils (AFVO) industry
- Education facilities; government establishments; information, finance, and insurance establishments; and religious organizations.

Farms

To accurately estimate the number of farms regulated under the SPCC rule, data showing the size and location of oil storage tanks on all farms in the United States would be required; however, these data do not exist. As an alternative approach, EPA relied on U.S. Census of Agriculture data on farm fuel expenses and supplementary data, and reasonable assumptions regarding the quantity of fuel represented by farm expenditures and the quantity of purchased fuel that is stored. This information was used to estimate probable storage quantities on farms to identify the SPCC-regulated universe of farms. The methodological steps and associated data sources are summarized in Exhibit E-1.

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Exhibit E-1
Methodological Steps Used to Estimate the Universe of SPCC-Regulated Farms

Step Number	Step Description	Data Sources Used
1	Identify the number of farms and fuel production expense ranges for gasoline and diesel	2002 Census of Agriculture, Farm Production Expenses, 2002 and 1997, Gasoline, fuels, and oils. 1997 Census of Agriculture, Petroleum Products Expenses, 1997, 1992, and 1987, Gasoline, diesel, natural gas, liquefied petroleum (LP) gas, fuel oil, kerosene, motor oil, grease, etc., Table 49: Summary by Size of Farm.
2	Convert production expense ranges to quantity ranges using fuel price data	United States Energy Information Administration, Gasoline and Diesel Fuel Update, 2002.
3	Estimate the quantity of purchased fuel that is stored on farms	1982 U.S. Census of Agriculture, Volume 1, County Table 6.
4	Estimate the percentage of farms in each quantity range that are regulated	Professional judgment.
5	Project estimated number of farms from 2002 to 2005	10-year average growth rate calculated from USDA National Agricultural Statistics Service, Number of Farms, 1996 to 2005.
6	Distribute regulated farms across oil storage capacity categories	U.S. EPA, "Analysis of the Number of Facilities Regulated by EPA's SPCC Program," July 1996.

The first step starts with the 2002 Census of Agriculture, which includes data on the number of farms by the range of production expenses on fuel. However, the 2002 data are available only in aggregate form for all fuel types. In order to disaggregate farm expenditures on all fuels in 2002 to expenditures on diesel and gasoline separately, EPA relied on the 1997 Census of Agriculture, which provides data on expenditures for a variety of fuel types, including diesel and gasoline.[3] Using the 1997 data, EPA calculated the ratios of diesel and gasoline expenditures to total expenditures for all farms, and then multiplied the total expenditure on fuels in 2002 by these ratios to arrive at estimated expenditures on diesel and gasoline in 2002. The derivation of these ratios is summarized in Exhibit E-2.

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[3] Other oil-based fuel types are reported in aggregate in the 1997 Census of Agriculture.

Exhibit E-2
Derivation of Farm Production Expenditures on Diesel and Gasoline, 1997

Fuel Type	Number of Farms	Total Expenditures ($1,000)
Petroleum products farms	1,760,000	$6,370,000
Gasoline and gasohol farms	1,370,000	$1,890,000
Diesel fuel farms	1,320,000	$2,850,000
Natural gas farms	71,000	$433,000
LP gas, fuel oil, kerosene, motor oil, grease, etc. farms	1,280,000	$1,210,000
Percentage of total expended on diesel		**44.7%**
Percentage of total expended on gasoline		**29.6%**

Source: 1997 Census of Agriculture, Table 49, Summary by Size of Farm.

There are two primary caveats to this methodological step. First, EPA assumed that the ratio of diesel and gasoline expenditures to total fuel expenditures by farms was identical in 1997 and 2002. To the extent that actual expenditures on diesel and gasoline in 2002 varied from 1997, the estimates presented may be over- or underestimates. Second, EPA excluded consumption of other fuels from the estimates because price estimates that would allow conversion from expenditures to quantities of fuel are not available for the aggregate bundle of fuels. This exclusion may yield actual quantity ranges of fuel use on farms that are higher than the estimates presented in the analysis.

For the second step, EPA converted total estimated expenditures on diesel and gasoline in 2002 to quantities of diesel and gasoline purchased. EPA divided the expenditure ranges by the average price of a gallon of gasoline/diesel as summarized in Exhibit E-3. As Exhibit E-3 shows, EPA estimated that in 2002, a gallon of gasoline cost $1.39 on average, while a gallon of diesel cost $1.32 on average.

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Exhibit E-3
Derivation of Average Gasoline and Diesel Price ($2002)

Region	Retail Price ($ per gallon)	
	Gasoline[1]	**Diesel Fuel[2]**
Central Atlantic	$1.41	$1.40
Gulf Coast	$1.32	$1.28
Lower Atlantic	$1.33	$1.28
MidWest	$1.36	$1.31
New England	$1.42	$1.40
Rocky Mountain	$1.40	$1.34
West Coast	$1.51	$1.41
Regional Average[3]	**$1.39**	**$1.35**
U.S. Average[4]	**$1.39**	**$1.32**

1 Gasoline prices represent the average of retail prices recorded weekly by the EIA in 2002 for all grades and formulations of gasoline.

2 Diesel prices represent the average of on-highway retail diesel prices of No. 2 diesel fuel with a sulfur level no higher than 0.05 percent by weight recorded weekly by the EIA in 2002.

3 The regional average is calculated as the average of all regional averages.

4 The U.S. average is calculated as the average of overall U.S. gasoline/diesel prices in 2002. For this reason, the regional and U.S. average prices for diesel fuel differ; however, the regional and U.S. average prices for gasoline do not differ. EPA uses the U.S. average price in estimating the quantity of gas and diesel purchased by farms.

Source: United States Energy Information Administration, Gasoline and Diesel Fuel Update, http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp, accessed on June 8, 2006.

For the third step of the analysis, EPA adjusted the quantities of gasoline and diesel purchased to represent the proportion of purchased gasoline and diesel that is stored on farms.[4] The best federal source of on-farm fuel storage data is the 1982 U.S. Census of Agriculture, which contains specific data on fuel storage and expenditures on farms.[5] As shown in Exhibit E-4, EPA estimated that, on average, approximately one-fourth of the annual quantity of diesel and gasoline purchased is stored on farms. Because data on the type of storage—aboveground or underground—are not available, EPA assumed that all gasoline and diesel storage on farms is aboveground.

4 To check the reasonableness of the calculations of oil storage on farms, extension services in a few states were consulted. A conversation with Tim Hewitt, a farm management specialist at the University of Florida, was notable. He categorically stated that the majority of the farmers in Florida, Georgia, and Alabama store oil in 500-gallon containers and, at most, 1,000-gallon tanks. Dennis Kauppila, a farm management specialist at the University of Vermont, also estimated that most farms store oil in 1,000-gallon tanks.

5 USDA's National Agricultural Statistics Service, County Table 6, 1982 U.S. Census of Agriculture, Volume 1. Information on fuel storage was not collected after 1982.

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Exhibit E-4
Derivation of Ratio of Gasoline and Diesel Stored to Purchased Using 1982 On-Farm Fuel Storage Census Data

State	Gasoline			Diesel			Total Gallons (1,000)	Gasoline		Diesel	
	Number of Farms	Gallons Stored (1,000)	Expenditure on Gas ($1,000)	Number of Farms	Gallons Stored (1,000)	Expenditure on Diesel ($1,000)		Gallons Purchased[1]	% Stored	Gallons Purchased[2]	% Stored
Alabama	11,100	5,300	$35,300	15,400	8,790	$38,500	14,100	28,100	19%	33,400	26%
Alaska	308	173	$517	175	130	$275	303	Data Not Available			
Arizona	2,650	2,780	$20,400	2,100	4,260	$24,300	7,000	16,200	17%	21,100	20%
Arkansas	13,200	7,580	$55,100	16,500	20,700	$92,000	28,300	43,800	17%	79,900	26%
California	36,300	26,600	$167,000	27,000	32,400	$185,000	59,000	132,000	20%	160,000	20%
Colorado	16,300	10,400	$53,900	11,700	9,940	$50,000	20,300	42,800	24%	43,100	23%
Connecticut	1,440	960	$5,390	909	558	$2,600	1,520	4,280	22%	2,260	25%
Delaware	1,820	1,050	$5,190	1,260	949	$5,020	2,000	4,130	25%	4,360	22%
Florida	7,360	6,190	$51,900	10,900	11,260	$62,500	17,500	41,200	15%	54,200	21%
Georgia	14,800	8,200	$52,900	20,200	14,500	$69,000	22,700	42,000	20%	59,900	24%
Hawaii	682	621	$7,780	643	733	$9,470	1,350	Data Not Available			
Idaho	14,900	10,200	$56,300	11,700	10,300	$50,200	20,500	44,700	23%	43,600	24%
Illinois	72,200	40,900	$178,000	55,000	42,000	$206,000	82,900	142,000	29%	179,000	23%
Indiana	50,500	23,000	$99,400	34,700	21,900	$108,000	44,900	79,000	29%	94,100	23%
Iowa	84,900	41,700	$187,000	67,500	42,000	$204,000	83,700	148,000	28%	177,000	24%
Kansas	47,500	24,900	$127,000	37,200	27,300	$156,000	52,100	101,000	25%	135,000	20%
Kentucky	30,300	11,900	$66,000	29,600	12,200	$50,700	24,000	51,600	23%	44,100	28%
Louisiana	9,100	5,000	$34,800	12,300	13,900	$67,900	18,900	27,700	18%	59,000	24%
Maine	2,490	1,540	$9,200	1,960	1,050	$5,400	2,590	7,310	21%	4,690	22%
Maryland	8,730	4,180	$18,900	6,040	3,460	$16,300	7,640	15,000	28%	14,200	24%
Massachusetts	1,670	970	$6,750	1,180	511	$2,470	1,480	5,360	18%	2,140	24%
Michigan	38,800	19,900	$70,700	25,900	16,900	$71,000	36,800	56,200	35%	61,600	27%
Minnesota	70,200	34,200	$155,000	53,400	34,400	$159,000	68,600	123,000	28%	138,000	25%
Mississippi	10,300	5,400	$40,100	15,800	17,100	$73,700	22,400	31,800	17%	64,000	27%
Missouri	61,900	26,800	$119,000	36,700	21,400	$102,000	48,200	94,300	28%	88,000	24%
Montana	16,300	12,300	$65,900	12,400	12,100	$54,500	24,400	52,400	23%	47,000	26%
Nebraska	43,000	24,400	$130,000	36,300	33,300	$166,000	57,700	104,000	24%	144,000	23%
Nevada	1,570	1,480	$7,730	1,140	1,260	$5,190	2,740	6,140	24%	4,510	28%
New Hampshire	939	478	$2,540	669	358	$1,430	836	2,020	24%	1,250	29%
New Jersey	4,260	2,410	$12,800	2,140	1,410	$7,030	3,830	10,100	24%	6,100	23%
New Mexico	4,450	2,930	$20,100	2,850	2,250	$13,500	5,180	16,000	18%	11,700	19%

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Exhibit E-4
Derivation of Ratio of Gasoline and Diesel Stored to Purchased Using 1982 On-Farm Fuel Storage Census Data

State	Gasoline			Diesel			Total Gallons (1,000)	Gasoline		Diesel	
	Number of Farms	Gallons Stored (1,000)	Expenditure on Gas ($1,000)	Number of Farms	Gallons Stored (1,000)	Expenditure on Diesel ($1,000)		Gallons Purchased[1]	% Stored	Gallons Purchased[2]	% Stored
New York	25,000	11,500	$62,300	18,300	9,190	$48,900	20,700	49,500	23%	42,500	22%
North Carolina	27,700	14,100	$74,400	27,700	14,800	$68,900	28,900	59,200	24%	59,800	25%
North Dakota	29,800	20,400	$101,000	26,500	25,900	$121,000	46,400	80,000	26%	105,000	25%
Ohio	52,300	21,300	$88,000	39,500	19,800	$92,000	41,100	70,000	30%	79,900	25%
Oklahoma	21,400	10,000	$65,400	24,900	16,000	$76,400	26,000	52,000	19%	66,400	24%
Oregon	17,900	11,200	$44,100	11,900	8,820	$33,100	20,000	35,100	32%	28,700	31%
Pennsylvania	32,600	14,400	$61,700	22,600	10,400	$41,600	24,800	49,000	29%	36,100	29%
Rhode Island	208	148	$782	155	81	$501	229	621	24%	435	19%
South Carolina	8,600	4,530	$25,800	9,090	6,000	$30,100	10,500	20,500	22%	26,100	23%
South Dakota	28,200	15,700	$91,500	22,200	15,500	$89,500	31,200	72,700	22%	77,700	20%
Tennessee	23,800	9,230	$46,800	26,500	12,000	$46,700	21,200	37,200	25%	40,600	29%
Texas	55,400	28,100	$186,000	55,900	44,600	$233,000	72,300	148,000	19%	203,000	22%
Utah	4,920	3,000	$17,800	4,510	3,000	$12,500	5,570	14,200	21%	10,800	24%
Vermont	2,790	1,320	$7,360	2,680	1,130	$6,130	2,450	5,850	23%	5,320	21%
Virginia	20,200	9,160	$42,300	17,200	7,270	$31,200	16,400	33,600	27%	27,000	27%
Washington	18,900	12,800	$56,700	13,600	12,600	$54,200	25,400	45,100	28%	47,000	27%
West Virginia	5,240	2,090	$8,280	4,170	1,240	$4,170	3,330	6,580	32%	3,620	34%
Wisconsin	62,900	26,000	$122,000	41,800	18,800	$89,500	44,700	96,800	27%	77,700	24%
Wyoming	6,090	4,650	$24,000	4,320	3,100	$13,400	7,750	19,200	24%	11,600	27%
U.S. Average									**24%**		**24%**

[1] Gallons of gasoline purchased in 1982 are estimated by dividing expenditures on gasoline by farms in this year by the average gasoline price in the U.S. ($1.26 per gallon) in 1982, as reported in monthly unleaded regular gas price data compiled by the EIA.

[2] Gallons of diesel purchased in 1982 are estimated by dividing expenditures on diesel by farms in this year by the average diesel price in the U.S. ($1.15 per gallon) in 1982, as reported in monthly diesel fuel price data compiled by the EIA.

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In the fourth step of the analysis, professional judgment was used to assign the percentage of farms regulated within each gasoline and diesel storage quantity range under low-end, medium, and high-end assumptions. These assumptions are presented in Exhibit E-5 for each gasoline and diesel storage quantity range.

In the fifth step, EPA projected the number of SPCC-regulated farms estimated from 2002 to 2005 using an estimated annual rate of growth of -0.44 percent, calculated from the change in the number of farms from 1996 to 2005 as recorded in the U.S. Census of Agriculture for these years.

Exhibit E-5 presents the results of the analysis of SPCC-regulated farms. As shown, the analysis suggests that the SPCC rule regulates approximately 151,000 farms (the medium estimate). The low- and high-end assumptions yielded approximately 148,000 and 154,000 SPCC-regulated farms, respectively.

Because the derived capacity ranges estimated for each farm-fuel-expenditure range are not the same as the four capacity categories used in the analysis, in the sixth step EPA distributed the SPCC-regulated farms across the capacity categories using the same distribution as that used in EPA's 1995 survey. Exhibit E-6 contains the results of the analysis distributed across oil storage capacity categories.

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Exhibit E-5
Derivation of the Number of SPCC-Regulated Farms in 2005[1]

Production Expenditure Ranges (all oils and LP gas)	Equivalent Diesel and Gasoline Quantity Purchased[2] (gallons)	Equivalent Diesel and Gasoline Storage Capacity (gallons)[3]	Total Number of Farms[4]	SPCC-Regulated Farms Estimates					
				High		Medium		Low	
				Fraction	Number	Fraction	Number	Fraction	Number
$1 to $1,000	< 600	< 100	1,180,000	0%	0	0%	0	0%	0
$1,000 to $5,000	600 to 2,800	100 to 700	536,000	0%	0	0%	0	0%	0
$5,000 to $10,000	2,800 to 5,500	700 to 1,300	138,000	7%	9,650	5%	6,890	3%	4,130
$10,000 to $25,000	5,500 to 13,900	1,300 to 3,300	101,000	100%	101,000	100%	101,000	100%	101,000
$25,000 to $50,000	13,900 to 27,600	3,300 to 6,700	28,700	100%	28,700	100%	28,700	100%	28,700
> $50,000	> 27,600	> 6,700	14,200	100%	14,200	100%	14,200	100%	14,200
Total			**2,000,000**	**8%**	**154,000**	**8%**	**151,000**	**7%**	**148,000**

1 The estimate assumes that all oil storage on farms is in aboveground storage tanks. Calculated values are rounded to three significant figures. Numbers may not add to totals because of rounding.

2 In 2002, expenditures on gasoline, diesel, and other fuels were not separately available. To calculate the diesel (gasoline) expenditure in 2002, EPA multiplied the total expenditure on fuel oils in 2002 by the ratio of diesel (gasoline) expenditure with respect to the total expenditure on fuel oils from the 1997 Census of Agriculture data. To arrive at the quantity of diesel (gasoline) purchased, EPA divided the expenditure on diesel (gasoline) by the average diesel (gasoline) price in 2002 available from the Gasoline and Fuel Update, Energy Information Administration (www.eia.doe.gov).

3 To estimate the storage capacity, EPA multiplied the diesel (gasoline) expenditure in 2002 by the ratio of expenditure on diesel (gasoline) with respect to storage from the 1982 Census of Agriculture, which collected information on fuel storage. Information on fuel storage was not collected after 1982.

4 These numbers reflect the total number of farms for which expense data were reported in the 2002 Census of Agriculture. The total number of farms in 2002 was 2,128,982, of which production data were available for 2,024,139.

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Exhibit E-6
SPCC Universe Estimates for Farms (Medium Estimate) (2010)[1]

Industry Sector	NAICS Code	Category I	Category II	Category III & IV	Total
Farms	111112	141,000	6,900	668	**149,000**

[1] The estimate for 2010 is based on the 2005 estimate of 151,000 farms projected into the future using the farm-specific growth rate.

Petroleum Bulk Station and Terminals, Fuel Oil Dealers, Pipelines, and Petroleum Refinery and Related Industries

Similar to EPA's approach in its 1991 and 1995 studies, the estimates for petroleum bulk station and terminals, fuel oil dealers, pipelines, and petroleum refinery and related industries were based on the assumption that *all* such facilities are regulated by the SPCC rule. EPA used data on the total number of facilities for petroleum bulk station and terminals, pipelines, and petroleum refinery and related industries from the 2002 U.S. Economic Census, and projected these data to 2010 using industry-specific growth rates.[6] As a result, EPA estimated that approximately 4,940 petroleum bulk stations and terminals, 4,320 fuel oil dealers, 663 pipelines, and 2,050 petroleum refining and related industries are regulated by the SPCC rule in the United States.

Because these data do not include information on the oil storage capacity at each facility, EPA used the distribution of these facilities from EPA's 1995 study to distribute facilities across the four capacity categories. Further, EPA assumed that the size distribution would be constant over the ten-year period of analysis, which may or may not adequately represent actual trends during this period. Exhibit E-7 contains the results of the analysis distributed across oil storage capacity categories.

Exhibit E-7
SPCC Universe Estimates for Petroleum Refinery and Related Industries, Pipelines, Petroleum Bulk Stations and Terminals, and Fuel Oil Dealers (2010)

Industry Sector	NAICS Code	Category I	Category II	Category III	Category IV	Total[1]
Petroleum Refinery and Related Industries	324	87	218	1,310	436	2,050
Pipelines	4861, 48691	663	0	0	0	663
Petroleum Bulk Stations and Terminals	4247	423	635	3,280	600	4,940
Fuel Oil Dealers	45431	301	1,610	2,210	201	4,320
Total		**1,470**	**2,460**	**6,800**	**1,240**	**12,000**

[1] Due to rounding, total estimates may not be an exact sum of the component estimates listed.

[6] Appendix G provides detailed information on the derivation of industry-specific growth rates used in the analysis.

Oil and Gas Production

EPA assumed that all oil production facilities are regulated under the SPCC rule. Certain gas production facilities may also be regulated, as some gas wells have tanks for storing condensate oil generated during the gas-production process. EPA used EIA data to estimate the total number of oil production wells as well as gas wells that produce condensate oil. All active wells that were producing in 2004 are considered in the analysis. The EIA database contains historical data on oil and gas wells, including marginal wells, compiled from government and commercial sources.[7] Key data fields included in the database are state, production year, number of wells, and annual oil and/or gas production. EIA provides data on oil and condensate oil produced at oil and gas production wells according to various production-rate classes. Gas wells that do not produce condensate oil are not included.

To convert the number of wells that produce oil and condensate oil to the total number of SPCC-regulated production facilities, EPA assumed four wells per facility, based on personal communication with industry experts.[8] Under this assumption, EPA estimated that approximately 166,000 oil production facilities are SPCC-regulated.

To determine the distribution of oil and gas production facilities across the four capacity categories, EPA used the distribution of these facilities derived in EPA's 1995 study. By taking this approach, EPA assumed that the distribution of oil production facilities across the four oil storage capacity categories has not changed over the last 10 years. Therefore, the distribution of estimated SPCC-regulated oil production facilities across capacity categories presented in this analysis may over- or underestimate the actual distribution. Exhibit E-8 contains the estimated number of oil production facilities distributed across oil storage capacity categories.

Exhibit E-8
SPCC Universe Estimates for Oil Production Facilities (2010)

Industry Sector	NAICS Code	Category I	Category II	Category III	Category IV	Total
Oil and Gas Production	211111	10,800	125,000	79,600	0	**215,000**

Electric Utilities

EPA calculated the number of SPCC-regulated electric utility facilities as the total number of power plants and substations in the United States, using data collected by the EIA.

To estimate the number of SPCC-regulated power plants, EPA used information from Form EIA-906, which reports the oil stock at each power plant that has a generation capacity greater than 1 megawatt, is connected to a local or regional electric power grid, and can draw power from the

[7] U.S. Energy Information Administration, Distribution and Production of Oil and Gas Wells by State, data available at http://www.eia.doe.gov/pub/oil_gas/petrosystem/petrosysog.html.

[8] Personal communication with a Federal On-Scene Coordinator for EPA Region 6 and Mark England, Texas Railroad Commission, 2005.

grid or deliver power to the grid.[9] Because data at the plant level are confidential, EIA provided summary statistics on the total number of plants in each capacity category, using information on oil stocks at each plant. EPA assumed that the information on oil stock held is a reasonable proxy for plant-specific capacity. While this estimate does not include plants that generate less than 1 megawatt of electricity, EPA assumed that the majority of plants with less than 1 megawatt of generation capacity store oil in volumes that are below the SPCC threshold.[10]

EPA estimated the number of substations using data reported to the Federal Energy Regulatory Commission (FERC) on Form No. 1.[11] FERC requires 176 major regulated utilities to file FERC Form No. 1, which provides information on their substations and electrical equipment. EPA estimated the number of substations owned by major utilities as the number of substations with unique names listed by each major utility on its FERC Form No. 1. A national estimate for the number of substations was obtained by extrapolating from these data using the ratio of the megawatt hours sold by owners and operators of major regulated facilities that filed Form No. 1 to the estimated total retail megawatt hours of electricity sold nationwide according to the EIA's March 2005 Electric Power Monthly.

EPA distributed substations across the four capacity categories based on information contained within an EPA study on the applicability of the SPCC rule to the electric utility industry.[12] This study estimated the percentage of substations storing oil in each size group and included information from EPA's Pollution Prevention Program. Using this approach, EPA's current analysis estimates that approximately 61,000 electric utility facilities (1,980 power plants and 59,000 substations) are SPCC-regulated. Exhibit E-9 presents the estimated number of electric utility plants and substations by oil storage capacity category.

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[9] Facilities report the amount of oil stored regardless of the type of oil they use. This definition of a facility differs from the definition of an "establishment" developed by the U.S Census Bureau, which was used for other industry sectors in the analysis. The U.S. Census Bureau definition is: "An establishment is a single physical location at which business is conducted or where services or industrial operations are performed." Therefore, EPA assumed that the information on oil stock held is a reasonable proxy for plant-specific capacity.

[10] EPA's 1991 study assumed that all electric utility plants store oil in excess of SPCC capacity thresholds. The 1995 survey, however, found that 40 to 60 percent of facilities did not meet the SPCC capacity criterion. Because the current estimates are based on the capacity at each plant and cover the majority of utility plants, the current estimates should be fairly accurate in representing the universe of SPCC-regulated electric power plants.

[11] Major regulated utilities must file FERC Form No. 1, on which utilities report information on their substations and electrical equipment. "Major" is defined as having (1) 1,000,000 megawatt hours or more; (2) 100 megawatt hours of annual sales for resale; (3) 500 megawatt hours of annual power exchange delivered; or (4) 500 megawatt hours of annual wheeling for others (deliveries plus losses). Information from the Federal Energy Regulatory Commission, available at http://www.ferc.gov/doc-filing/eforms.asp.

[12] U.S. Environmental Protection Agency (EPA), July 1996, "Analysis of the Number of Facilities Regulated by EPA's SPCC Program."

Exhibit E-9
Estimated Number of Electric Utility Plants and Substations (2010)

Facility Type	Category I	Category II	Category III	Category IV	Total
Power Plants	284	430	909	361	1,980
Substations	22,400	22,400	14,200	0	59,000
Total (2010)	**22,700**	**22,800**	**15,100**	**361**	**61,000**

Military Installations

Military installations include Army, Navy, Air Force, National Guard, Marine Corps, and Coast Guard bases, stations, schools, and commands, and associated infrastructure such as medical centers. Accurately estimating the number of SPCC-regulated military installations is difficult, because data on oil storage within these facilities are not readily available or do not allow for division of facilities into oil storage capacity tiers. For this reason, EPA used available data on current military installations in the United States and employed simplifying assumptions to identify potentially regulated military facilities.

A recent report published by the Department of Defense on base closure and realignment contains a list of current military installations by economic region in the United States.[13] According to the report, there are 711 currently active military installations in the United States. As in EPA's 1991 study, the Agency assumed that all of these military installations store enough oil to reach the SPCC threshold. Then, in the absence of oil storage capacity information for each facility, EPA used the distribution from EPA's 1995 study to allocate military facilities across the four capacity tiers. Using this distribution yielded estimates of military installations by capacity tier, as summarized in Exhibit E-10. EPA estimated 148 regulated military facilities in Category I; 148 regulated military facilities in Category II; 296 regulated military facilities in Category III; and 118 regulated military facilities in Category IV.

[13] U.S. Department of Defense. 2005. "Base Closures and Realignment Report." Volume I Part 1 of 2: Results and Process. May; U.S. Department of Defense, 2005. "Total Number of Military Installations." Where We Serve: Information About Defense Department Installations.

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Exhibit E-10
Derivation of Number of Regulated Military Facilities

Oil Storage Capacity Category	1995 Survey Estimates	Percentage of Total Facilities (1995)	Number of Military Installations (2005)[1]
I	239	21%	148
II	239	21%	148
III	477	42%	296
IV	190	17%	118
Total	**1,150**	**100%**	**711**

[1] The number of military facilities in 2005 was estimated by multiplying total military facilities in 1995 by the percentage of total facilities in each capacity tier as represented by the 1995 survey.

Exhibit E-11 presents the projected universe of SPCC-regulated military installations, by size category, using growth rates from 1995 to 2005.

Exhibit E-11
SPCC Universe Estimates for Military Installation Facilities (Projected to 2010)

Industry Sector	NAICS Code	Category I	Category II	Category III	Category IV	Total
Military Installations	928110	159	159	319	127	766

Animal Fats and Vegetable Oils

Previous EPA estimates focused on petroleum and petroleum-related oil, even though facilities handling or storing non-petroleum oil are also subject to SPCC rule regulations. Non-petroleum oil includes, but is not limited to, animal fats, oils, and greases; fish and marine mammal oils; and oils of vegetable origin, including oils from seeds, nuts, fruits, and kernels. These types of substances are referred to collectively as “animal fats and vegetable oils” (AFVO) within SPCC regulations. Animal fats and vegetable oils are used both as primary edible products and as inputs to production in the manufacture of other edible and inedible products. Examples of inedible uses include soap, paint and varnish, animal feed, resins and plastics, fuel, drilling fluids, lubricants, and fatty acids.

Animal fats and vegetable oils are processed to varying degrees depending on the end use of the product, and chemical composition changes at each step in processing. Chemical composition can also be changed by storage, heating, or reactions in the environment. Processing steps in vegetable oil facilities are generally independent operations that are not connected by continuous flow. Between each processing step there may be one or more storage tanks. Many crude vegetable oil storage tanks, which are usually constructed of welded carbon steel, have a capacity of 1 million pounds (approximately 140,000 gallons); these tanks may be located in the open or enclosed in a structure. Storage tanks for finished fats and oils

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are generally made of iron, stainless steel, or aluminum, and typically hold between 75 and 200 tons (about 21,000 to 56,000 gallons) of product.[14]

While animal fats and vegetable oils are consumed widely in the United States for edible and inedible uses, developing estimates of the quantity stored or handled by industry is difficult due to the wide range of industries that use AFVO as inputs to production, the multiple processing steps for these oils, and the lack of a centralized database with information on AFVO storage for each industry. In addition, the state databases identified for this analysis contain information only on petroleum and petroleum-related oils. For this reason, EPA used available data on likely AFVO-related industries, combined with plausible assumptions, to estimate the number of AFVO facilities that are SPCC-regulated.

Specifically, EPA started with data on the number of manufacturing establishments from the 2005 U.S. Census of Manufacturing. Four possible types of AFVO facilities were considered: (1) industries that produce AFVO; (2) industries that use AFVO as a primary input; (3) industries that use AFVO in moderate amounts; and (4) industries that use AFVO as a minor component of their input. EPA assumed that all facilities that produce AFVO (group 1) are SPCC-regulated. Then, low, medium, and high estimates were developed using professional judgment for industries in the remaining three groups regarding the percentage of each industry group assumed to be regulated by the SPCC rule. EPA also identified a category of “other” facility types that may produce or use AFVO. For these facilities, specific information on the number of regulated facilities was available and was used instead of the assumed percentages. These assumptions are summarized in Exhibit E-12.

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[14] Data presented in this paragraph are from U.S. Environmental Protection Agency, "Denial of petition requesting amendment of the Facility Response Plan rule," 62 FR 54510, October 20, 1997.

Exhibit E-12
Derivation of Potentially Regulated AFVO Facilities

Facility Type	Description of Facility Type	Assumed Percentage of Total Facilities Regulated[1]		
		Low	Medium	High
AFVO producer	Comprises facilities that are engaged primarily in the production and/or processing of AFVO.	100%		
User of AFVO as major input	AFVO is a major input in production of other goods; however, not all facilities may use AFVO.	50%	70%	90%
User of AFVO as moderate input	Several facilities likely use large quantities of AFVO; however, many may not, depending on the specific products the facility manufactures.	20%	50%	80%
User of AFVO as minor input	AFVO use by facilities is limited to alternative or unconventional products. For example, industries such as pesticide, paint and coating, printing ink, and soap and other detergent manufacturing use vegetable oil as an alternative to their conventional inputs, and are included in this category. Also included in this category are facilities that may have minor AFVO storage capacity, or industries that use significant quantities of petroleum oils but may also use AFVO.	1%	5%	10%
Other[2]	Specific information on the number of regulated facilities is available for the industry sector and is used instead of the assumed percentages.	N/A	N/A	N/A

1 In the absence of publicly available data that would allow an accurate estimate of storage capacity at facilities that produce or use AFVO, EPA developed a range of percentages for each facility type identified above to reasonably bound the universe of potentially regulated facilities under the SPCC rule. Given that these percentages are based on assumptions regarding the relative production or use of AFVO within each facility type, they are subject to a considerable degree of uncertainty.

2 EPA identified a category of "other" facility types that may produce or use AFVO. For these facilities, specific information on the number of regulated facilities was available and was used instead of the assumed percentages.

Exhibit E-13 presents the results of applying these assumed percentages to the total number of relevant manufacturing establishments based on U.S. Census of Manufacturing data. As shown, EPA estimated that between 3,000 and 12,000 manufacturing facilities that produce, use, or store AFVO might be SPCC-regulated, or on average approximately 7,790 manufacturing facilities.

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Exhibit E-13
Analysis of Potentially Regulated AFVO Facilities under the SPCC Rule

NAICS Code	Industry Title	Total Number of Facilities[1]	Production/Level of Use of AFVO[2]	Assumed Percentage of Total Facilities Regulated[3]			SPCC Universe Estimate		
				Low	Medium	High	Low	Medium	High
311111	Dog and Cat Food Manufacturing	188	Moderate	20%	50%	80%	38	94	150
311119	Other Animal Food Manufacturing	1,514	Moderate	20%	50%	80%	303	757	1,210
311221	Wet Corn Milling[4]	58	Other	Other	Other	Other	25	25	25
311222	Soybean Processing[5]	93	Other	Other	Other	Other	9	9	9
311223	Other Oilseed Processing	54	Producer	100%	100%	100%	54	54	54
311225	Fats and Oils Refining and Blending	132	Producer	100%	100%	100%	132	132	132
31123	Breakfast Cereal Manufacturing	71	Moderate	20%	50%	80%	14	36	57
31132	Chocolate and Confectionery Manufacturing from Cacao Beans	164	Moderate	20%	50%	80%	33	82	131
31133	Confectionery Manufacturing from Purchased Chocolate	861	Moderate	20%	50%	80%	172	431	689
31134	Non-Chocolate Confectionery Manufacturing	625	Moderate	20%	50%	80%	125	313	500
311412	Frozen Specialty Food Manufacturing	412	Moderate	20%	50%	80%	82	206	330
311423	Dried and Dehydrated Food Manufacturing	156	Moderate	20%	50%	80%	31	78	125
311512	Creamery Butter Manufacturing	34	Producer	100%	100%	100%	34	34	34
311513	Cheese Manufacturing	525	Not Used	0%	0%	0%	0	0	0
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing	215	Not Used	0%	0%	0%	0	0	0
31152	Ice Cream and Frozen Dessert Manufacturing	451	Moderate	20%	50%	80%	90	226	361
311611	Animal (except Poultry) Slaughtering	1,393	Not Used	0%	0%	0%	0	0	0
311612	Meat Processed from Carcasses	1,297	Moderate	20%	50%	80%	259	649	1,040
311613	Rendering and Meat Byproduct Processing	240	Producer	100%	100%	100%	240	240	240
311615	Poultry Processing	472	Moderate	20%	50%	80%	94	236	378
311711	Seafood Canning	166	Moderate	20%	50%	80%	33	83	133
311712	Fresh and Frozen Seafood Processing	678	Not Used	0%	0%	0%	0	0	0
311812	Commercial Bakeries	2,766	Moderate	20%	50%	80%	553	1,380	2,210
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	238	Moderate	20%	50%	80%	48	119	190
311821	Cookie and Cracker Manufacturing	380	Moderate	20%	50%	80%	76	190	304
311823	Dry Pasta Manufacturing	266	Moderate	20%	50%	80%	53	133	213
31183	Tortilla Manufacturing	235	Moderate	20%	50%	80%	47	118	188

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Exhibit E-13
Analysis of Potentially Regulated AFVO Facilities under the SPCC Rule

NAICS Code	Industry Title	Total Number of Facilities[1]	Production/Level of Use of AFVO[2]	Assumed Percentage of Total Facilities Regulated[3]			SPCC Universe Estimate		
				Low	Medium	High	Low	Medium	High
31191	Snack Food Manufacturing	565	Moderate	20%	50%	80%	113	283	452
311911	Roasted Nuts and Peanut Butter Manufacturing	146	Moderate	20%	50%	80%	29	73	117
311919	Other Snack Food Manufacturing	419	Moderate	20%	50%	80%	84	210	335
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing	328	Major	50%	70%	90%	164	230	295
311991	Perishable Prepared Food Manufacturing	445	Moderate	20%	50%	80%	89	223	356
311999	All Other Miscellaneous Food Manufacturing	856	Moderate	20%	50%	80%	171	428	685
32532	Pesticide and Other Agricultural Chemical Manufacturing	260	Minor	1%	5%	10%	3	13	26
32551	Paint and Coating Manufacturing	1,497	Minor	1%	5%	10%	15	75	150
325611	Soap and Other Detergent Manufacturing	807	Minor	1%	5%	10%	8	40	81
32591	Printing Ink Manufacturing[6]	567	Other	Other	Other	Other	50	100	150
49311	General Warehousing and Storage	3,921	Minor	1%	5%	10%	39	196	392
49312	Refrigerated Warehousing and Storage	877	Minor	1%	5%	10%	9	44	88
49313	Farm Product Warehousing and Storage	486	Minor	1%	5%	10%	5	24	49
49319	Other Warehousing and Storage	1,213	Minor	1%	5%	10%	12	61	121
4931901	Household goods warehousing & storage	317	Not Used	0%	0%	0%	0	0	0
4931902	Specialized goods warehousing & storage	896	Not Used	0%	0%	0%	0	0	0
Total		**27,284**					**3,340**	**7,620**	**12,000**

1 Data on the number of facilities by NAICS code are from the 2002 Economic Census of the United States. Number of facilities not rounded to 3 significant figures because source had greater level of precision.

2 The selected NAICS codes include facilities that may produce AFVO or use AFVO as a major, moderate, or minor input to production of other goods. The assigned type of facility indicates whether the facilities associated with a particular NAICS code may produce AFVO as their primary good or, for facilities that may use AFVO as an input to production, indicates the assumed relative use of AFVO as an input in these facilities. EPA also identified a category of "other" facility types that may produce or use AFVO. For these facilities, specific information on the number of regulated facilities is available and is used instead of the assumed percentages.

3 For an explanation of the assumed percentage of facilities that are regulated for each NAICS code under the low, medium, and high estimates, see Exhibit E-12.

4 The Corn Refiners Association provided specific information on NAICS code 311221, "Wet Corn Milling", identifying 25 corn-refining plants that are owned by its members. According to the Association, these 25 plants represent the majority of the industry.

5 The 2002 Economic Census of the United States data for NAICS code 311221 identifies nine soybean oil facilities. While this number provides a specific estimate of soybean oil facilities, EPA notes it may be an underestimate if some soybean processing facilities are included under other NAICS codes but also produce soybean oil.

6 According to www.soyink.com, there are approximately 100 U.S. ink manufacturers that produce at least one soy ink product, and 77 U.S. companies manufacture SoySeal Certified ink.

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This methodology yielded estimates of the number of facilities that may be regulated based only on their anticipated storage of AFVO. Some of these facilities may be regulated because they also store petroleum oils. Therefore, some double counting of the facilities may be present. In the absence of more specific data on this industry, this source of error cannot be measured or addressed.

Given the lack of information on the oil storage capacity at each facility, the distribution of facilities across different size categories was assumed to be the same as that for Food Manufacturing Facilities (NAICS 311) based on their petroleum and related oil capacity.[15] Exhibit E-14 presents the estimates of AFVO facilities (medium estimate) distributed across oil storage capacity categories.

Exhibit E-14
Estimated Number of Animal Fats and Vegetable Oil Facilities (2010)

	Category I	Category II	Category III	Category IV	Total
Manufacturing facilities using and storing AFVO	2,670	3,510	1,620	0	**7,790**[1]

[1] The estimate for 2010 is based on the 2005 estimate of 7,620 AFVO facilities projected into the future using the industry-specific growth rate.

Education, Religious Organizations, and Government Establishments

The 1997 U.S. Economic Census data used to extrapolate the number of facilities from state databases to the entire universe of SPCC-regulated facilities do not include religious organizations, educational facilities, or government-owned establishments. Therefore, extrapolation using state databases was not possible for these facilities. For this reason, EPA estimated the number of storage tanks in commercial buildings using the 1995 and the 2003 Commercial Buildings Energy Consumption Survey (CBECS).[16] The CBECS is a national sample survey that collects energy-related building characteristics data as well as energy consumption and expenditures data for commercial buildings in the United States. It includes information on the principal business activity of the given building and information on the ownership of the building by government or private institutions. Until 1995, the CBECS also collected information on the oil storage capacity of tanks at these buildings.

Because data on storage tank capacity have not been collected since the 1995 survey, EPA estimated the total tank capacity at each building from the 1995 survey data and projected it to 2003 using the growth in the square footage of buildings during this time period as a proxy for the growth in the total storage capacity. Using this approach, EPA estimated a 1.03 percent annual growth rate in total storage capacity at educational buildings, a 1.04 percent annual

[15] EPA assumed that most AFVO facilities are in the food manufacturing industry, and that facilities that store larger quantities of petroleum and related oils (and are therefore large facilities) may store similar quantities of AFVO. Such facilities may have different storage of AFVO as compared to petroleum oil. In particular, small facilities that produce AFVO may store much larger quantities of AFVO as compared to petroleum and related oils that are used for energy.

[16] EPA uses these two years because 1995 is the most recent year for which data on oil storage capacity of tanks at commercial buildings were collected, and 2003 is the most recent year in which the survey was conducted.

growth rate in total storage capacity at religious buildings, and a 1.02 percent annual growth rate at government facility buildings from 1995 through 2003. These annual growth rates correspond to overall adjustment factors of 28 percent for educational buildings, 34 percent for religious buildings, and 16 and 72 percent for government buildings over the entire period.[17] To arrive at the estimate for 2005, EPA extrapolated the number of buildings assuming this rate of growth for each sector. Exhibit E-15 summarizes the derivation of the adjustment factor for each industry considered in this analysis.

Exhibit E-15
Derivation of Adjustment Factor for Education, Religious, and Government Establishments[1]

Industry	1995 Data			2003 Data			Estimated Adjustment Factor[2]
	Number of Buildings	Total Square Footage	Average Square Feet	Number of Buildings	Total Square Footage	Average Square Feet	
Education	309,000	7,740,000,000	25,100	386,000	9,874,000,000	25,600	28%
Religious	270,000	2,792,000,000	10,400	370,000	3,754,000,000	10,100	34%
Government	705,000	10,478,000,000	14,900	824,000	12,208,000,000	14,800	16%
Other [3]	67,300	1,004,000,000	14,906	79,000	1,738,000,000	21,900	72%

1 Numbers are not rounded to three significant figures because sources had greater levels of precision.

2 Oil storage capacity data were collected for buildings in these industries in 1995 but not in 2003. For this reason, the adjustment factor is calculated as the percentage increase in total square footage for buildings in each industry category from 1995 to 2003, and is used to adjust the 1995 oil storage capacity data to 2003 by assuming that the factor is a proxy for growth in total oil storage capacity within these buildings.

3 Federal and state government buildings that are contained within the "other" category in the 1995 and 2003 CBECS.

Sources:

1995 data are from the U.S. Energy Information Administration CBECS, available at http://www.eia.doe.gov/emeu/cbecs/detailed_tables_1995.html.

2003 data are from the 2003 CBECS, available at http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/detailed_tables_2003.html.

Finally, given that the CBECS does not distinguish between aboveground and underground storage, EPA assumed that buildings in metropolitan areas have underground storage due to scarcity of aboveground storage, and that buildings in non-metropolitan areas have aboveground storage. EPA assumed that all the underground storage tanks comply with UST requirements and are exempt from SPCC requirements. Exhibit E-16 summarizes the results of the analysis. As shown, EPA estimated that approximately 6,900 educational facilities, 1,400 religious organizations, and 550 government facilities are SPCC-regulated.

Exhibit E-17 summarizes results across the oil storage capacity categories used in the analysis. The presence of tank capacity data in the 1995 CBECS allows for direct distribution of facilities into the capacity categories. However, to the extent that estimated 2005 tank capacities deviate

17 Two adjustment factors are estimated for government buildings because the 1995 and 2003 surveys include government buildings in two categories: "office" and "other."

from the actual capacities, the estimated distribution may over- or underestimate the actual distribution of facilities across the capacity categories.

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Exhibit E-16
Estimation of the Number of Regulated Educational, Religious, and Government Facilities in 2005[1]

Industry	1995 Data		Adjustment Factor[2]	2003 Estimate		Industry Growth Rate (%)[3]	2005 Estimate		Total Regulated Facilities (2005)
	Category I	Category II		Category I	Category II		Category I	Category II	
Education	1,380	3,720	28%	1,760	4,750	1.03	1,870	5,050	**6,900**
Religious	978	0	34%	1,310	0	1.04	1,410	0	**1,400**
Government[3]	171	0	16%	199	0	1.02	552	0	**550**
Other (Labs)[4]	193	0	72%	333	0				
Total	**2,720**	**3,720**		**3,600**	**4,750**		**3,830**	**5,050**	**8,880**

1 These industries do not contain facilities with oil storage capacity greater than 42,000 gallons; for this reason, corresponding capacity tiers are not included in this table.

2 The adjustment factor was calculated as the annual increase in total square footage of buildings in each industry. EPA used this factor as the industry growth rate to forecast 2003 results to 2005.

3 EPA used the calculated adjustment factor as the industry growth rate. The industry growth rate for government was calculated using office building data only.

4 Facilities owned by federal and state governments are contained within the "office" and "laboratory" categories in the 1995 survey.

5 The 1995 survey includes government laboratories as a separate data category; the 2003 survey does not. For this reason, the analysis subsumes government-owned laboratories into the "other" category in 2003.

Source: 1995 data are from the U.S. Energy Information Administration CBECS, available at http://www.eia.doe.gov/emeu/cbecs/detailed_tables_1995.html.

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Exhibit E-17
Estimated Number of Education, Religious Organizations, and Government Establishments (2010)

Industry	Category I	Category II	Category III	Category IV	Total[1]
Education	2,310	6,240	0	0	8,560
Religious	1,520	0	0	0	1,520
Government	595	0	0	0	595
Total	**4,425**	**6,240**	**0**	**0**	**10,700[2]**

[1] Due to rounding, total estimates may not be an exact sum of the component estimates listed

[2] The estimates for 2010 are based on the 2005 estimates projected into the future using industry-specific growth rates.

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APPENDIX F

Proximity of Facilities to Navigable Waters

The Spill Prevention, Control, and Countermeasure (SPCC) rule is applicable to facilities that have oil storage capacity above a certain threshold and could reasonably be expected to discharge oil into the navigable waters of the United States or adjoining shorelines.[18] Due to the lack of numeric information on spatial characteristics of facilities, EPA considered all facilities storing oil in the amounts above the threshold to be within reach of navigable waters. The Agency undertook the task to better understand the proximity of regulated facilities to navigable waters. This appendix analyzes data obtained from the Integrated Data for Enforcement Analysis (IDEA) system, which contains environmental performance data on EPA-regulated facilities, and stream reach data[19] in order to determine the fraction of facilities located within three distances from navigable waters: 0.25 miles, 0.5 miles, and 1 mile. Although the IDEA system does not cover all the potential SPCC-regulated facilities (industry sectors regulated by SPCC are not fully covered by IDEA) and likely includes facilities that are not SPCC-regulated (no determination on the oil storage capacity was made in this analysis), EPA assumed that the analyzed sample is representative of the SPCC-regulated universe. Therefore, this analysis provides a reasonable sample to assess the proximity of SPCC-regulated facilities to navigable waters.

Methodology

Since EPA did not have spatial information on SPCC-regulated facilities, the Agency performed a GIS analysis on both SPCC-regulated and non SPCC-regulated facilities. These facility-level data from IDEA contain facility information for approximately 2 million records.[20] This analysis included only facilities with sufficient data (i.e., it excludes null values and erroneous values) for the following variables: latitude, longitude, Standard Industrial Classification (SIC) codes, and states. The latitude and longitude data are from two sources: the Facility Registry System and a demographics database in IDEA. In case both are populated, this analysis used the demographics database.

This analysis uses high spatial resolution ESRI U.S. River and Stream river data (2004) and U.S. National Atlas Water Feature Lines (1999)[21] for complete coverage of the United States.[22]

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[18] It is important to note that the Agency did not consider jurisdictional determinations in its estimate of the universe of facilities.

[19] ESRI, 2004, U.S. River and Stream river data; U.S. National Atlas Water Feature Lines, 1999, available at: http://www.nationalatlas.gov/atlasftp.html.

[20] The exact total is 2,126,492 records.

[21] ESRI, 2004, U.S. River and Stream river data; U.S. National Atlas Water Feature Lines, 1999, available at: http://www.nationalatlas.gov/atlasftp.html.

The U.S. River and Stream data are based on the National Hydrography Dataset (NHD), which is mainly based on U.S. Geological Survey topographic maps at a scale of 1:100,000. In general, the following rules apply: streams are longer than one mile; streams flow from a lake; channels are defined; and lakes/ponds have an area greater than 6 acres. These rules were not always evenly applied to the data due to scale and legibility constraints, and the variability of the map quadrangles data (especially on their borders).[23] These data provide the linear water features for aqueducts, canals, intracoastal waterways, and streams of the United States at the largest scale of 1:1,000,000.

Next, the Agency performed a buffer analysis of three classifications of facilities: facilities less than 0.25 miles from navigable waters, facilities less than 0.5 miles from navigable waters, and facilities less than 1 mile from the navigable waters. EPA then overlaid the facilities location with these three buffer distances from the stream data.

Finally, the results of the analysis were summarized for selected specific industries regulated by SPCC based on North American Industry Classification System (NAICS) code using a similar SIC provided by the facility data.

Results

From the IDEA facility data, 347,335 facilities met the selection criteria: 341,154 within the onshore borders of the 50 states and 6,181 facilities outside the borders. Of the facilities within the onshore border of the United States, approximately 43.6 percent are within 0.25 miles of navigable waters, 70.9 percent are within 0.5 miles of navigable waters, and 90.2 percent are within 1 mile of navigable waters. Exhibit F-1 displays the estimated universe of onshore facilities near navigable waters by industries that are SPCC regulated.[24] The number of facilities increases with the increase of buffer size; there is an approximate two-fold increase from <0.25 mile buffer distance to <1 mile buffer distance. In the selected industry categories, manufacturing, other commercial, and other services have the largest number of facilities near navigable waters. Exhibit F-2, Exhibit F-3, and Exhibit F-4 display the onshore U.S. facility data for the buffer distances of 0.25 miles, 0.5 miles, and 1 mile, respectively. Most of the facilities near navigable waters (and inherently navigable waters and facilities themselves) are located in the eastern United States and along the West Coast.

[22] The U.S. River and Stream river data do not include Alaska, so the Alaska river data are from the U.S. National Atlas Water Feature Lines (1999).

[23] Standards for the National Hydrography Dataset (USGS, 1999) are available online through: http://mapping.usgs.gov/standards (Accessed February 7, 2007).

[24] Note that all facilities within the industry categories regulated by SPCC may not be SPCC regulated because facilities could be below the SPCC capacity threshold.

Exhibit F-1
Estimated Universe of Onshore U.S. Facilities Near Navigable Waters[1]

Industry Category	NAICS Code	Buffer Distance from Navigable Waters						Total Number of Facilities in Industry
		<= 0.25 Miles		<= 0.5 Mile		<= 1 Mile		
		Number of Facilities	Percent of Total Facilities	Number of Facilities	Percent of Total Facilities	Number of Facilities	Percent of Total Facilities	
Oil and Gas Production	211111	990	41.5%	1,510	63.2%	2,060	86.4%	2,390
Farms	111,112	4,100	55.3%	6,190	83.4%	7,000	94.4%	7,420
Electric Utility Plants	2211	12,600	50.6%	19,100	76.9%	23,100	92.9%	24,800
Petroleum Refining and Related Industries	324	2,570	48.0%	4,060	76.0%	4,920	92.0%	5,350
Chemical Manufacturing	325	9,320	41.6%	16,020	71.5%	20,200	90.2%	22,400
Food Manufacturing	311,312	7,240	39.6%	12,800	70.3%	16,500	90.2%	18,300
Manufacturing facilities using and storing AFVO	311,325	16,000	40.8%	27,800	71.0%	35,300	90.3%	39,100
Metal Manufacturing	331,332	18,300	40.9%	31,300	70.0%	39,400	88.0%	44,700
Other Manufacturing	31-33	99,900	41.7%	171,000	71.4%	215,000	89.8%	239,000
Real Estate Rental and Leasing	531-533	6,260	48.6%	9,510	73.9%	11,700	90.8%	12,900
Retail Trade	441-446, 448,451-454	12,000	40.6%	20,500	69.7%	26,900	91.4%	29,500
Contract Construction	23	13,800	51.3%	21,200	78.9%	25,400	94.6%	26,900
Wholesale Trade	42	7,550	44.0%	12,600	73.6%	15,900	92.5%	17,100
Other Commercial	492,541,551, 561-562	22,400	43.0%	37,500	72.0%	47,500	91.1%	52,100
Transportation	481-488	11,200	42.1%	18,500	69.5%	24,000	90.0%	26,700
Arts Entertainment & Recreation	711-713	5,810	48.5%	9,150	76.3%	11,200	93.0%	12,000
Other Services (Except Public Administration)	811-813	19,500	37.2%	34,300	65.3%	46,100	87.7%	52,500
Education	611	4,300	39.3%	7,640	69.7%	9,750	89.1%	11,000
Petroleum Bulk Stations and Terminals	4247	1,850	44.9%	3,050	74.0%	3,870	93.8%	4,130
Hospitals & Other Health Care	621-624	3,970	37.6%	7,140	67.6%	9,230	87.3%	10,600
Accommodation and Food Services	721-722	4,250	47.0%	6,930	76.8%	8,680	96.2%	9,020
Fuel Oil Dealers	45431	3,530	45.3%	5,780	74.1%	7,310	93.7%	7,800

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Exhibit F-1
Estimated Universe of Onshore U.S. Facilities Near Navigable Waters[1]

Industry Category	NAICS Code	Buffer Distance from Navigable Waters						Total Number of Facilities in Industry
		<= 0.25 Miles		<= 0.5 Mile		<= 1 Mile		
		Number of Facilities	Percent of Total Facilities	Number of Facilities	Percent of Total Facilities	Number of Facilities	Percent of Total Facilities	
Gasoline stations	4471	9,860	39.1%	17,000	67.2%	22,500	89.1%	25,200
Information Finance and Insurance	51, 52	4,630	37.5%	8,310	67.3%	10,600	86.2%	12,300
Mining	212-213	7,760	57.8%	11,100	82.4%	12,800	95.1%	13,400
Religious Organizations	813110	270	37.3%	490	67.2%	680	93.5%	720
Warehousing and Storage	493	930	45.0%	1,520	73.1%	1,920	92.9%	2,070
Military Installations	928110	350	41.9%	580	69.9%	750	90.3%	830
Pipelines	4861, 48691	340	47.9%	540	76.0%	660	93.1%	700
Government	92	2,130	43.6%	3,510	71.8%	4,360	89.3%	4,880
Total Unique Facilities[2]		**149,000**	**43.6%**	**242,000**	**70.9%**	**308,000**	**90.2%**	**341,000**

[1] Navigable waters defined by two river datasets: ESRI, 2004, U.S. River and Stream river data; U.S. National Atlas Water Feature Lines, 1999, available at: http://www.nationalatlas.gov/atlasftp.html.

[2] The value for total unique facilities is not the sum of industries in each industry category because some industry categories may include facilities from other industry categories.

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Exhibit F-2
Distribution of Facilities within 0.25 Miles Buffer of Navigable Waters

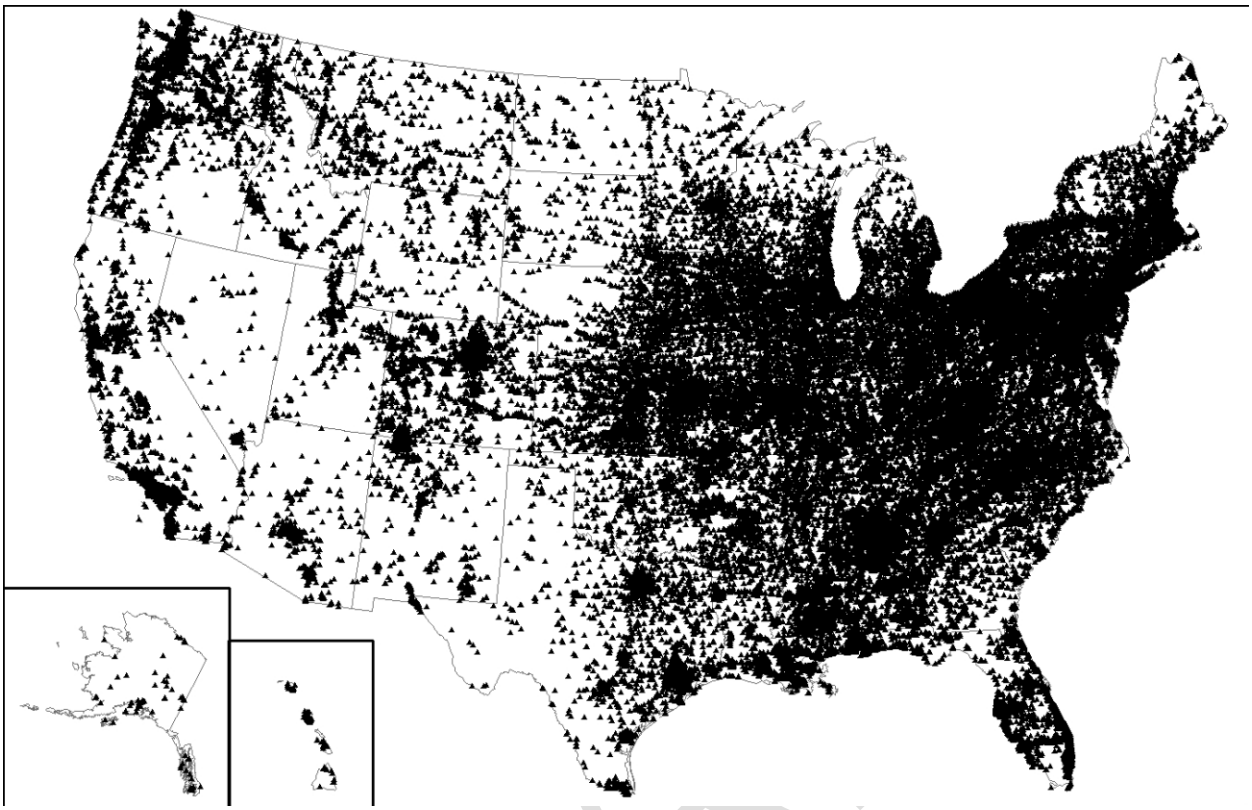

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Exhibit F-3
Distribution of Facilities within 0.5 Miles Buffer of Navigable Waters

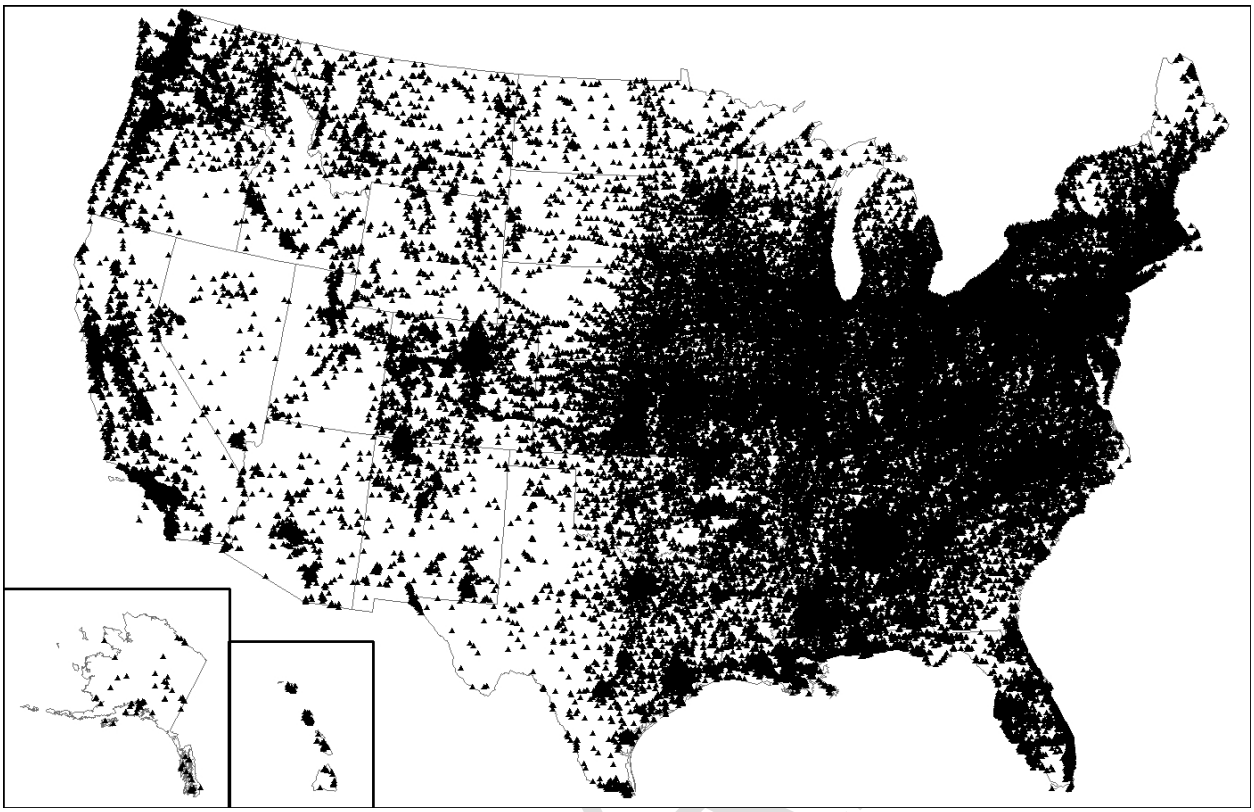
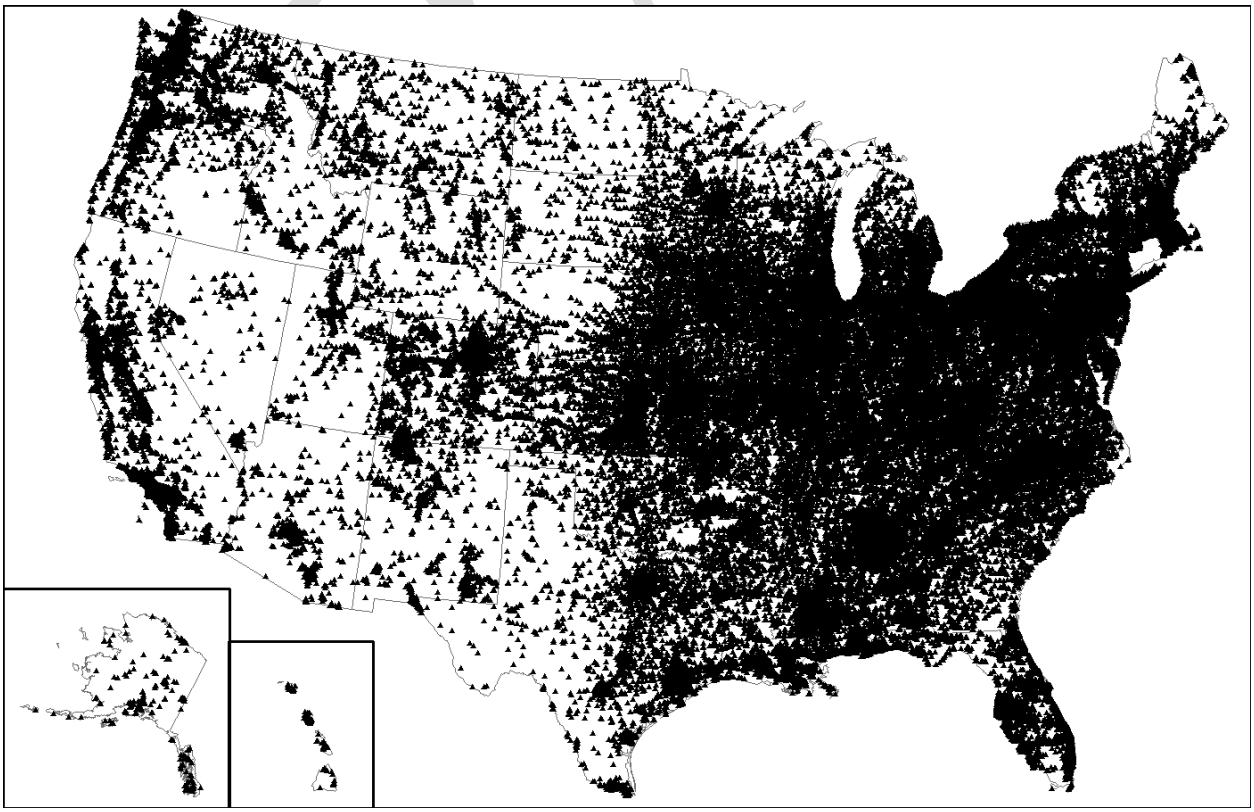


Exhibit F-4
Distribution of Facilities within One Mile Buffer of Navigable Waters



APPENDIX G

Projecting SPCC Universe Estimates Using Derived Industry Growth Rates

To project the number of existing and new facilities regulated under the SPCC rule over the period of analysis (2010 through 2019), EPA developed separate estimates of industry-specific growth rates for existing and new facilities. For existing facilities, EPA used U.S. Economic Census data for all industries except for farms and oil and gas production, for which alternative data sources were used. For new facilities, EPA used information obtained from the D&B Market Spectrum database for all industries except for oil and gas production, for which a specific methodology was employed.

This appendix describes the methodologies used to develop the industry growth rate estimates to project the universe of SPCC-regulated facilities. The methodologies for oil and gas production, as well as farms, differed from the rest of the regulated universe based on the data sources available and the specific compliance needs.

Growth Rates for Existing Facilities in All Industry Categories Excluding Farms and Oil and Gas Production

To estimate industry-specific growth rates for all SPCC-related industry categories except farms and oil and gas production, EPA used 1992, 1997, and 2002 U.S. Economic Census data on the number of establishments in each industry. One issue with this approach is the transition in the Census data, around 1997, from the U.S. Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS) to provide a more accurate representation of the changing economy. This transition resulted in a reshaping of certain industry sectors. As a result of the transformation of the industry classification system, the census reports the data on the number of establishments as follows:

Year 1992 - SIC
Year 1997 - SIC and NAICS
Year 2002 - NAICS.

Because the data for 1992 and 2002 are reported in different classification systems, EPA identified corresponding NAICS sectors for SIC industry sectors in 1992 using a concordance developed by the U.S. Census Bureau that links sectors in the two classification systems. The major drawback of sector mapping is that some NAICS sectors comprise more than one SIC sector, and some SIC sectors partially correspond to NAICS sectors. While not all sectors align fully between NAICS and SIC, some of the key SPCC industry categories (e.g., oil and gas production and petroleum refining) correspond precisely. To reconcile differences introduced by the two industry classification systems, EPA developed a methodology to allow use of the data on the number of establishments reported in SIC for 1992 and NAICS for 2002:

(1) NAICS and SIC sectors are linked to the corresponding SPCC-regulated industry categories used in the analysis.

(2) Data are obtained on the number of establishments for SPCC industry categories for three years (1992, 1997, and 2002).

(3) For 1997, a ratio is estimated of the number of establishments reported in the NAICS and SIC classification systems. For each SPCC industry category, a ratio is then calculated of the number of establishments reported in NAICS to the number of establishments reported in SIC.

(4) The ratio estimated in the previous step is used to translate the number of establishments reported for 1992 from SIC to NAICS.

(5) Industry-specific growth rates are estimated based on the change in the number of establishments reported in NAICS from 1992 to 2002.

The use of an extended time period to estimate industry-specific growth rates attempted to account for diverse economic conditions under which SPCC-regulated industries operate. Economic indicators, including gross domestic product, suggest a noticeable decline in industrial productivity beginning in 1998 that contributed to a period of recession in the early 2000s. Therefore, the use of 1997 and 2002 Economic Census data to forecast the annual change in the total number of SPCC facilities beyond 2002 would not always be appropriate. The purpose of integrating Economic Census data for 1992 was to capture changes in industry growth under the more favorable economic conditions that existed between the early 1990s and 1997.

Growth Rates for Existing Agricultural Facilities

To estimate annual growth rates for agricultural establishments, EPA used data reported by the USDA National Agricultural Statistics Service on the number of farms in the United States over the past 10 years (1996 through 2005).[25] The data for the past 10 years were expected to be more representative of the latest developments in the agricultural business than data for years prior to 1996.

Growth Rates for New Facilities in All Industry Categories Excluding Oil and Gas Production

In this analysis, SPCC-regulated facilities were divided into existing and new facilities to reflect the differences in compliance activities between the two groups. Therefore, EPA estimated the number of both new and existing facilities for each year of the analysis. While the number of existing facilities subject to the SPCC rule was estimated using industry-specific growth rates as described above, these growth rates are likely to underestimate growth in the number of new facilities because they also incorporate the rate at which facilities go out of business. The cost differential between new facilities coming under compliance with SPCC requirements versus

[25] USDA National Agricultural Statistics Service data, available at http://www.nass.usda.gov:8080/QuickStats/Create_Federal_All.jsp.

facilities that close annually may not be zero. As a result, EPA disaggregated the industry-specific growth rates to separate trends in the number of new facilities from trends in the total number of facilities.

EPA estimated the growth rates for new facilities only by using commercially available data on the number of businesses (by NAICS code) in 2005, obtained from the Dun & Bradstreet (D&B) Market Spectrum database. These data allowed for an estimation of the fraction of businesses that became operational in 2005 relative to the total number of businesses in that year. When comparing the growth rates for existing facilities to those for new facilities, the following adjustment was made: when the industry growth rate for new facilities was less than that for existing facilities, the growth rate for new facilities was set equal to the rate for existing facilities. This discrepancy occurred because growth rates were calculated using data for different years (1992 to 2002 for existing facilities and 2005 for new facilities); the adjustment was needed because data for the ten-year period was expected to be more representative of future growth than one year's worth of data.

This analysis assumed that industry growth rates would be constant over the ten-year analytical period for all industries except oil and gas production, which may or may not adequately represent the trends for individual sectors. A list of estimated growth rates for existing and new facilities for all industry groups included in the analysis is presented in Exhibit 4-10 of Volume I. Growth rates for new and existing oil and gas production facilities are discussed in the following section.

Growth Rates for New Oil and Gas Production Facilities

Because oil and gas production facilities account for the largest fraction of SPCC-regulated facilities across all industry categories and represent a dynamic industry, an alternative approach was used for estimating future oil and gas production industry growth rates. EPA relied on industry-specific forecasting information, which was expected to reflect growth rates better than an approach based on historical trends. Using a constant growth rate for the entire analytic period is unlikely to adequately reflect future growth dynamics in the oil and gas production industry.

EPA derived the number of oil and gas production facilities from the number of oil wells as discussed in Appendix E. Complete data on the projected number of oil wells beyond 2004 were not available. However, a study conducted for the U.S. Department of Energy (DOE) includes a forecast of marginal natural gas and oil well counts through 2025.[26] The approach used in the DOE analysis relied on two main data sources: the Annual Energy Outlook (AEO) published annually by the Energy Information Administration (EIA), and the Marginal Oil and Gas annual publication of the Interstate Oil and Gas Compact Commission (IOGCC).

[26] For detail, see Don J. Remson, "A Forecast of Marginal Natural Gas and Oil Well Data," June 2005. U.S. Department of Energy, National Energy Technology Laboratory, available at http://www.netl.doe.gov/technologies/oil-gas/publications/AP/MarginalWellData_Topical.pdf.

Due to the lack of readily available data on oil well forecasts, EPA projected the number of oil and gas production facilities over the period of analysis (through 2019), following the methodology developed in the DOE study on marginal wells:

(1) Acquired historical total U.S. oil production data for the years 1995 through 2004. EIA reports the annual values of crude oil production in barrels per day for 1919 through 2004.[27]

(2) Obtained forecasted total oil production data through 2019 from EIA. EPA used the data on domestic crude oil production for 1990 through 2030 from the Annual Energy Outlook 2006, with projections to 2030.[28]

(3) Projected the average oil well rate into the future. EPA first estimated the daily production rate per well (barrels of oil produced per well per day) by dividing annual oil production by the number of wells and the number of days in a year. Then, EPA regressed the year versus historical daily well rate data to derive a linear function for forecasting future average production rates.

(4) For each year of the forecast, 2005 through 2019, EPA estimated the number of wells by dividing the predicted oil production by forecasted average production rate.

(5) Estimated the number of oil and gas production facilities based on the total number of oil wells using four wells per facility.

(6) Calculated annual growth rates for the oil and gas production facilities for 2005 through 2019.

The results are shown in Exhibit G-1.

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[27] U.S. Energy Information Administration, data available at http://www.eia.doe.gov/pub/oil_gas/petrosystem/petrosysog.html.

[28] U.S. Energy Information Administration, data available at http://www.eia.doe.gov/oiaf/aeo/graphic_data.html.

Exhibit G-1
Projected Number of Oil and Gas Production Facilities and Estimated Growth Rates

Year	Number of Facilities	Annual Growth Rate
2005	166,000	-2.31%
2006	177,000	6.46%
2007	184,000	3.89%
2008	193,000	5.21%
2009	207,000	6.95%
2010	215,000	4.07%
2011	221,000	2.92%
2012	230,000	4.09%
2013	240,000	4.08%
2014	250,000	4.07%
2015	259,000	3.59%
2016	271,000	4.73%
2017	279,000	2.94%
2018	288,000	3.27%
2019	299,000	3.79%

A sharp increase is expected in the number of oil and gas production facilities due to a continuously decreasing production rate at oil wells and relatively stable total oil production in the United States. EIA states in its 2006 Annual Energy Outlook that a large proportion of the total U.S. resource base of onshore conventional oil has been produced, and new oil reservoir discoveries are likely to be smaller, more remote, and increasingly costly to exploit.[29]

[29] U.S. Energy Information Administration, Annual Energy Outlook 2006.

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APPENDIX H

A Comparison of Unit Costs

EPA compared the unit costs used in its analyses to similar estimates produced by the U.S. Department of Energy (DOE), the American Petroleum Institute (API), and the Steel Tank Institute (STI). STI's estimates were taken from the February 2007 edition of its newsletter, *Tank Talk* (Volume 22, Number 1).

An analysis of comparable cost estimates is provided in Exhibit H-1 below. DOE and API estimates apply strictly to production facilities, whereas the STI figures are generic facility estimates. API considered relatively small production facilities in its analysis, providing estimates applicable only to single well sites. DOE and STI also considered point estimates of compliance costs, aimed to be representative of costs typical facilities would incur. EPA, by contrast, calculated unit costs for each of four size categories of both storage and production facilities. Most of the figures provided by DOE, API, and STI fall within the generally broader ranges that EPA addressed; however, in cases when EPA's estimates differed substantially from those of DOE, API, or STI, Exhibit H-1 provides rationales for these discrepancies.

Exhibit H-1
Comparison of Unit Costs

Relevant Cost Item	DOE	API	STI	EPA[1]	
	Production	Production	Storage & Production	Storage	Production
SPCC Plan Development, Writing, and Professional Engineer (PE) Certification	$3,500	--	--	$12,500 to $19,400	$9,390 to $14,300
PE Certification of Existing SPCC Plan Only	--	--	$500 to $10,000	$4,690	$3,190
SPCC Plan Amendments	--	$300 to $600	--	$2,140 to $9,080	$1,430 to $6,120
PE Certification of SPCC Plan Amendments[2]	--	$150 to $300	$200 to $1,000	$5,030 to $7,450	$3,220 to $5,030
Secondary Containment for Loading/Unloading Racks and Aboveground Piping[3]	--	--	$2,000 to $50,000	$4,860 to $23,400	$22,400 to $33,600
Secondary Containment for Aboveground Flowlines and Piping[3]	--	$1,000	--	$3,720 to $8,380	$4,960 to $11,200

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Exhibit H-1
Comparison of Unit Costs

Relevant Cost Item	DOE	API	STI	EPA[1]	
	Production	Production	Storage & Production	Storage	Production
Contingency Plan for Flowlines and Gathering Lines[4]	$10,000 to $15,500	--	--	--	$6,310 to $7,960
Flowline Maintenance Program[5]	$5,000	--	--	--	$5,000
AST Integrity Testing (Per Tank)[6]	--	--	$3,500	$500 to $2,500	$500 to $2,500
Overfill Prevention Systems and Alarms (Per Tank)[7]	--	--	$1,500 to $3,000	$2,000 to $18,000	--
Containment for Truck Loading Area	--	$825 to $2,500	--	$4,530 to $8,870	$4,530 to $8,870

1 EPA's estimates were compiled with the help of SCS Engineers, an engineering firm with experience over a wide range of industries across the 48 contiguous U.S. states.

2 API and STI's cost estimates do not include transportation fees involved in PE certification, and apply only to very small facilities (API's costs are relevant only to production facilities with one well; STI does not specify the characteristics of the type of facility to which its estimates apply). SCS Engineers, contracted by EPA to value compliance costs to SPCC-regulated facilities, has experience over a wide range of industries across the 48 contiguous U.S. states. The estimates provided by SCS Engineers account for labor burden incurred by managerial, technical, and clerical workers. According to SCS Engineers' assumptions, technical workers charging $120 per hour are expected to provide the majority of the labor necessary to certify SPCC amendments, and the total labor burden is expected to be between 7 and 96 hours depending on the size of facility and scale of changes involved in the amendment needing certification. By contrast, API assumes the certification process will be completed using 2 to 4 hours of labor at $75 per hour. STI does not provide details on the relevant unit costs involved in its calculations.

3 API and STI's estimates for secondary containment only include measures that are practical from an engineering standpoint. The comparatively high estimates produced by EPA for production facilities include costs for containment of aboveground piping that would likely be claimed impracticable by these facilities. In EPA's analysis of facility-level costs, the Agency factors in the assumption that all facilities would likely claim impracticability rather than incur these high costs.

4 The high-end cost figures provided by both DOE and EPA consider the scenario where operators do not have to place secondary containment around flow and gathering lines and must implement an enhanced flowline and gathering line maintenance program. In this case, EPA's figure only includes the added cost of a flowline maintenance program, assuming that the added costs of gathering line maintenance will be negligible. DOE's estimates differ substantially from EPA's estimates. However, DOE does not provide a detailed explanation of the unit components of its cost figures.

5 DOE's estimate is for implementing an enhanced inspection and testing program for flowlines and gathering lines in the absence of secondary containment around flow and gathering lines. DOE calculates its estimate for a facility with two miles (10,560 feet) of flow and gathering lines. EPA's estimate is for developing and implementing a program of flowline maintenance to prevent discharges from each flowline. EPA assumes that the length of flowlines at applicable facilities is 6,000 feet.

6 STI's estimate applies to turn-key, non-destructive integrity testing of shop-fabricated ASTs. EPA's estimate applies to hydrostatic, non-destructive, shell thickness testing of ASTs.

7 The estimates STI provides correspond to overfill prevention systems and alarms, whereas those of EPA correspond to all relevant liquid level sensing devices.

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APPENDIX I

Unit Cost Inventory

As part of the effort to complete the regulatory impact analysis for the 2007 final amendments to the Spill Prevention, Control and Countermeasures (SPCC) rule, Abt Associates Inc. developed a unit cost inventory with unit cost estimates for complying with the requirements of the 2002 amendments to the SPCC rule. To complete this task, Abt Associates hired a Professional Engineering (PE) firm, SCS Engineers, with significant experience in both preparing and reviewing SPCC Plans and constructing structures according to SPCC requirements. This firm also serves a breadth of industry categories across the 48 contiguous states of the United States.

Abt Associates provided SCS Engineers with a Microsoft Excel template that exhaustively documented all SPCC requirements as row items with a detailed description of each requirement and its corresponding rule language. In addition, Abt Associates provided columns for describing any sub-activity that might necessitate a separate cost estimate, as well as columns for detailing any possible cost varying factors. Abt Associates also divided the Excel template into separate sections to address “new” and “existing” facilities, as it was expected that compliance costs would be different for these different classes of facilities. Abt Associates requested separate estimates for labor hours, equipment, and total costs associated with the SPCC requirements. In addition, Abt Associates requested that the PE firm provide separate unit costs for any cost varying factors such as industry type, geographical region, or facility size.

SCS Engineers responded by providing Abt Associates with specific estimates of both new and existing facilities, for both oil production and storage facilities and across four facility size categories. The four size categories were broken down by total regulated capacity as follows: Category I facilities hold 1,320 to 10,000 gallons of total regulated capacity; Category II facilities have from 10,001 gallons to 42,000 gallons; Category III covers facilities with between 42,001 gallons and 1,000,000 gallons regulated capacity; Category IV includes all facilities with more than 1,000,000 gallons of regulated capacity. The PE firm indicated that while there were several facility characteristic factors, such as geography, that would affect unit costs, the main factor would be facility size. Furthermore, given the limited resources and time, SCS Engineers indicated that capturing other reasons for variation was not feasible. Accordingly, for each unit cost estimate, the PE firm provided a midpoint estimate over all geographical regions. SCS Engineers noted that in general unit costs would be higher on the West Coast and in the Northeast region. SCS Engineers provided data sources for their cost estimates in a separate column.

After receiving a final draft of the compliance cost estimates from SCS Engineers, Abt Associates worked with the firm to conduct a quality check, which involved verifying calculations and making sure assumptions were consistent across the sheets. Given constraints on resources and time, SCS was able to provide a cost estimate for only one facility size category for oil production facilities – Category III facilities (42,001 to 1,000,000 gallons of regulated

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capacity). Abt Associates worked with SCS to develop the assumptions and the cost estimates for the remaining three size categories for production facilities. Abt Associates verified with SCS Engineers that when labor costs varied by facility size, it would be appropriate to assume that Category I facilities (the group of the smallest production facilities) would incur half of the labor burden of Category II facilities; Category II facilities would incur half of the labor burden of Category III facilities; and Category IV facilities (the group of the largest production facilities) would incur one-and-a-half times the labor burden met by Category III facilities. In calculating compliance costs for all categories of production facilities, estimates for labor hours that varied by facility size were scaled according to these conversion factors to produce estimates for the remaining three facility size categories.

SCS Engineers provided all of its labor estimates assuming that a PE firm would complete the work, even in cases where facility personnel could complete the task. Abt Associates generated alternate estimates assuming that facility personnel would complete the task. SCS Engineers estimated that facility personnel would take approximately half as many hours as professional laborers to complete tasks involving labor burden because of the time involved in traveling to and from facilities. In addition to incurring increased labor hours, SCS Engineers assumed that facilities would incur a cost of $200 per trip to cover fixed transportation costs involved with hiring professional engineers to satisfy the labor requirements of compliance activities.

Exhibit I-1 provides an example of the unit cost inventory with estimates for new storage facilities in size Category III. As discussed previously, EPA's unit cost inventory included estimates for four different categories of facilities based on size, different estimates for storage and production facilities, and different estimates for new and existing facilities. Only a small portion of the unit cost inventory is presented here due to the exhaustive nature of the cost analysis.

Data sources for each cost item in the inventory are not presented in Exhibit I-1 due to space constraints. SCS Engineers relied on their own estimates whenever they had the data for a unit cost item and used the other sources only when they did not have the data. They listed the following nine data sources in calculating unit costs for storage facilities:

- SCS Engineers
- Naval Facilities Engineering Service Center. 2003. Spill Prevention, Control, and Countermeasure (SPCC): A Guide to the SPCC Regulation. Port Hueneme, CA.
- RSMeans. 2006. CostWorks. (http://www.meanscostworks.com).
- U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Office of Energy Management. 2005. *Regulatory Analysis for the Proposed Revisions to the Oil Pollution Prevention Regulation (40 CFR PART 112).*
- General Services Administration Advantage (http://www.gsadavantage.gov).

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- Bowhead Manufacturing Company, LLC (http://www.bmccatalog.com).
- New Pig Corporation (http://www.newpig.com).
- 2003 National Construction Estimator (http://www.get-a-quote.net).
- U.S Navy. 2002. *Environmental Requirements Guidebook.*

In addition to these data sources, the engineering firm listed the following additional data source for production facilities:

- Assessment of the Potential Costs and Energy Impacts of Spill, Prevention, Control and Countermeasures Requirements for U.S. Oil and Natural Gas Production, Prepared for USDOE by Advanced Resources International, Inc. 2006.

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
PLAN PREPARATION AND MAINTENANCE													
Prepare an SPCC Plan.	§112.3	N/A	N/A	7	90	30	12						$11,300
Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures.	§112.7(b)	N/A	N/A	2	30		6						$3,060
Prepare a facility diagram.	§112.7(a)(3)	N/A	Accurate facility diagram exists.	2	12	30							$3,500
			Accurate facility diagram does not exist. Needs aerial survey to prepare base map.										$0
Prepare a discussion of conformance with applicable more stringent state rules, regulations and guidelines, in the SPCC Plan.	§112.7(j)	N/A	N/A	1.5	24		3						$2,360

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency (if the facility has not submitted a Facility Response Plan).	§112.7(a)(4)	N/A	N/A	1.5	24		3						$2,360
Plan Certification													
Certify the SPCC Plan.	§112.3(d)	PE certifies existing Plan	N/A		36		3						$4,490
Re-certify the SPCC Plan because of technical amendments to the Plan.	§112.5(c)	N/A for new facility	Minor changes										$0
			Major changes										$0
Paperwork													
Perform a 5-year review of the SPCC Plan.	§112.5(b)	PE conducts site visit											$0
Amend the SPCC Plan due to changes made at the facility.	§112.5(a)	N/A for new facility	Minor changes										$0
			Major changes										$0

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
SPCC PLAN IMPLEMENTATION ACTIVITIES													
If, for any of the requirements described in this section (except for secondary containment), you provided a method of equivalent environmental protection instead, please describe these measures and give a cost estimate for developing and implementing them.	§112.7(a)(2)	"Environmentally equivalent" provisions are included as line items where applicable in the remainder of this table.											$0
Anti-Corrosive Measures													
Provide coatings or cathodic protection to protect partially buried tanks from corrosion.	§112.8(c)(4), §112.12(c)(4)	Completely buried metallic storage tank. Coating at $8/sf.	1,000 gallon tank									$1,280	$1,280
			10,000 gallon tank									$6,000	$6,000
		Partially buried metallic storage tank. Coating at $8/sf. Assumes 50% of completely buried tank.	1,000 gallon tank									$640	$640
			10,000 gallon tank									$3,000	$3,000
Provide coatings or cathodic protection to	§112.8(d)(1), §112.12(d)(1)	Coatings	200' 4" pipe					8		200	$2		$908

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
protect buried piping from corrosion.			500' 4" pipe					20		500	$2		$2,270
		Cathodic	200' 4" pipe										$0
			500' 4" pipe										$0
		Double wall fiberglass fuel piping, with leak detection [environmental equivalence]	500' 4" pipe					16	$10,000				$11,100
		API 570 inspection program [environmental equivalence]	500' 4" pipe			40	40						$4,640
Design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction.	§112.8(d)(3), §112.12(d)(3)	Assume 1,000 feet of 4 inch pipe. Assume 125 supports.	2 tank containment areas, 500 ft pipe each							125	$5		$625
										125	$225		$28,100

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Drainage Measures													
Provide drainage systems for the associated tank truck loading/unloading areas or a loading rack (if a loading rack is present at the facility).	§112.7(h)(1)	Sump with pump and product piping (4" -50') to convey discharges to container containment area	Assume 1 installation			10	10		$3,000				$4,160
Restrain drainage from diked storage areas by using valves of manual, open-and-close design.	§112.8(b)(2), §112.12(b)(2)	Manual open and closed design (i.e., ball valve or gate valve)	2 drainage areas					8		2	$300		$1,160
		Hydrophobic/oleophilic drain shutoff system [environmental equivalence]	Varies according to size and complexity of facility, assume 2 drainage areas							2	$5,400		$10,800
Design facility drainage systems from undiked areas with a potential for a discharge.	§112.8(b)(3), §112.12(b)(3)	The cost for this item is difficult to approximate even in general terms.											$0
Secondary Containment Measures													
If you determined secondary containment to be impracticable under §112.7(d) and the facility has not submitted a Facility Response Plan,	112.7(d)	Describe Structures/Equipment		3	18		3						$2,000
		Explain why containment is impracticable		3	36		6						$3,690

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
please (1) describe those structures/equipment for which you determined secondary containment to be impracticable and (2) explain why containment is impracticable, and (3) estimate the cost of completing an oil spill contingency plan for them.		Prepare Oil Spill Contingency Plan		9	60		6						$6,410
Provide secondary containment for a loading/unloading rack. Describe methods. Provide separate estimates for different methods.	§112.7(h)(1)	Rollover concrete berms with 8" thick concrete slab (5,000 gal)	$11,713 each. Cost provided for 2 loading/unloading areas.							2	$11,700		$23,400
		Use 6" high asphaltic curbing installed on existing pavement (5,000 gal)	$570/each. Cost provided for 2 loading/unloading areas.							2	$570		$1,140
Provide secondary containment for bulk storage containers. Describe methods. Provide separate estimates for different methods.	§112.8(c)(2), §112.12(c)(2)	Earthen berms	Scenario I: (3) 20,000 gallon tanks							3	$3,370		$10,100
			Scenario II: Area 1: (2) 25,000 gallon tanks, (3) 50,000 gallon tanks									$18,200	$18,200

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
			Scenario II: Area 2: (3) 100,000 gallon tanks									$21,200	$21,200
		Concrete berm	Scenario I: (3) 20,000 gallon tanks							3	$13,400		$40,200
			Scenario II: Area 1: (2) 25,000 gallon tanks, (3) 50,000 gallon tanks									$83,400	$83,400
			Scenario II: Area 2: (3) 100,000 gallon tanks									$97,200	$97,200
Provide secondary containment for mobile/portable oil storage containers. Describe methods. Provide separate estimates for different methods.	§112.8(c)(11), §112.12(c)(11)	Rollover concrete berms with 8" thick concrete slab (1,000 gal container)										$3,780	$3,780
		6" high asphalt cubing on existing pavement (1,000 gal container)								76	$4		$270
Install drain covers and spill kits.	§112.7(c)	Filling procedure with drain cover and spill kit	2 truck loading/unloading areas							2	$850		$1,700

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Provide secondary containment at a transfer area (other than a loading/unloading rack). Describe methods. Provide separate estimates for different methods.	§112.7(c)	Small portable containment berm										$800	$800
		Concrete berm	748 gallons (to hold 500 gallon tank)									$3,130	$3,130
		Masonry berm	479 gallons (to hold 250 gallon tank)									$1,550	$1,550
		Doorway spill barrier	3' x 1' manual									$2,990	$2,990
			4' x 1' manual									$3,700	$3,700
			3' x 1' automatic									$4,630	$4,630
			6' x 1' automatic									$7,320	$7,320
Provide secondary containment for piping. Describe methods. Provide separate estimates for different methods.	§112.7(c)	Double wall piping assume 500 feet of 4 inch pipe	25' lengths, 4" diameter, $20/ft					16		1000	20.00		$21,100
Provide secondary containment for oil-filled electrical equipment. Describe methods. Provide separate estimates for different methods.	§112.7(c)		Per unit, each unit <1,320 gallons									$1,500	$1,500

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Provide secondary containment for oil-filled operating equipment. Describe methods. Provide separate estimates for different methods.	§112.7(c)		Per unit, each unit <1,320 gallons									$1,500	$1,500
Provide secondary containment for oil-filled manufacturing equipment. Describe methods. Provide separate estimates for different methods.	§112.7(c)		Per unit, each unit <1,320 gallons									$1,500	$1,500
Security Measures													
Fully fence the facility.	§112.7(g)(1)	500' x 500' x 6', Chainlink	10 acre site							2000	$19	$1,180	$38,900
		700' x 700' x 6', Chainlink	20 acre site							2800	$19	$1,180	$54,000
		Fence only oil storage/transfer areas and environmental equivalence statement	Area 1: 70' x 100' x 6' Area 2: 70' x 120' x 6'	1.5	18		3			782	$19	$1,180	$15,900

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Provide adequate security measures for valves.	§112.7(g)(2)	Assumes the installation of 2 locking valves per containment area	2 tank containment areas, 2 loading/unloading areas					8		8	$100		$1,360
Locate the starter control for each oil pump at a site accessible only to authorized personnel.	§112.7(g)(3)												$0
Provide facility lighting to help discover discharges and prevent vandalism.	§112.7(g)(5)		Assume 1 per unloading/loading area, 4 per tank containment areas									$22,400	$22,400
Cap and blank-flange terminal connections at the transfer point and marking it as to origin when the piping is not in use.	§112.8(d)(2), §112.12(d)(2)	Done by facility personnel	1 per tank and loading/unloading area					4		4	$100		$680
Other Measures													
Install liquid level sensing devices.	§112.8(c)(8), §112.12(c)(8)	Scully Signal system for tank truck loading	2 truck loading/unloading areas						$36,000			$7,200	$43,200

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
		Magnetorestrictive fuel monitoring system for two tanks, includes leak and overfill protection							$17,500			$10,000	$27,500
		Magnetorestrictive fuel monitoring system for two tanks, designed for inventory purposes only							$5,000			$1,000	$6,000
Equip the final discharge of ditches inside the facility with a diversion system to retain oil in the facility (if the facility's drainage is not designed in accordance with paragraph §112.8(b)(3)). Describe methods.	§112.8(b)(4), §112.12(b)(4)	Done by facility personnel	$7 to $16 per linear ft. Use $12 per ft. and assume 200 ft		2					200	$7		$1,520
					2					200	$16		$3,320
Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations. Describe	§112.8(d)(5), §112.12(d)(5)	Warning Signs	2 signs					2		2	$150		$407
		Verbally warn drivers and install bollards around tanks [environmental equivalence]	20 bollards							20	$520		$10,400

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
methods.		Verbally warn drivers and install guard rails [environmental equivalence]	Area 1: 70' x 100' Area 2: 70' x 120'							720	$21		$14,800
Provide two pumps (if the facility has drainage waters treated in more than one treatment unit continuously).	§112.8(b)(5), §112.12(b)(5)	1/4 hp sump pump							$99.40			$81.80	$181
		1/3 hp sump pump							$118.00			$81.80	$200
Training													
Prepare for and hold training. Describe trainings provided for facility personnel.	§112.7(f)(1)	Done by facility personnel		2	20		4						$1,300
		Done by engineering firm		2	20		4		$100			$200	$3,220
Prepare for and hold discharge prevention briefings.	§112.7(f)(3)	Done by facility personnel		2	12		2						$820
		Done by engineering firm		2	12		2		$100			$200	$2,150
Train a designated person responsible for discharge prevention.	§112.7(f)(2)	Designate a person at each applicable facility who is accountable for discharge prevention and who reports to facility management.			2								$107

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Inspections and Testing													
Perform periodic integrity testing (if secondary containment around bulk storage containers is impracticable).	§112.7(d)	Hydrostatic testing, non-destructive shell thickness testing	Costs range from $500 to $2,500 per tank.							8	$1,500		$12,000
Inspect the lowermost drain and all outlets of such vehicles, and if necessary ensure that they are tightened, adjusted, or replaced (if a loading rack is present at the facility).	§112.7(h)(3)	Done by facility personnel	Cost per truck		0.25								$13
Inspect pumps, ejectors, dikes, and containers for oil discharge.	§112.8(b)(1), §112.12(b)(1)	Done by facility personnel	Cost per inspection event		2								$107
Perform integrity testing of aboveground bulk storage containers with secondary containment.	§112.8(c)(6), §112.12(c)(6)	Hydrostatic testing, non-destructive shell thickness testing	Costs range from $500 to $2,500 per tank.							8	$1,500		$12,000
		External inspection per STI 001 for shop built tanks [environmental equivalence]	Costs range from $500 to $1,000 per tank.							8	$750		$6,000

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Monitor the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse.	§112.8(c)(7), §112.12(c)(7)	Done by facility personnel	Cost per inspection event		0.5								$27
Leak test completely buried metallic storage tanks.	§112.8(c)(4), §112.12(c)(4)	Done by contractor	$1,500/tank + $750/pipe run									$2,250	$2,250
Conduct integrity and leak testing buried piping.	§112.8(d)(4), §112.12(d)(4)	Done by contractor	500 ft. buried pipe					6.4	$160			$300	$908
								16	$400			$500	$1,820
Test liquid level sensing devices to ensure proper operation.	§112.8(c)(8)(v), §112.12(c)(8)(v)	Done by facility personnel	2 hrs per tank, 3 to 8 tanks		6								$322
					16								$858
Inspect piping for deterioration and corrosion.	§112.8(d)(1), §112.12(d)(1)	Done by facility personnel	Assume 1,000 ft of aboveground pipe		5								$268
Inspect all aboveground valves, piping and appurtenances.	§112.8(d)(4), 112.12(d)(4)	Done by facility personnel	Assume 1,000 ft of aboveground pipe		5								$268

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
Perform brittle fracture evaluation of field-constructed containers (if field-constructed containers are present).	§112.7(i)	20,000 gal steel AST										4750	$4,750
Observe effluent treatment facilities to detect discharge (if such facilities are present).	§112.8(c)(9), §112.12(c)(9)	Done by facility personnel	Cost per inspection event		1								$54
Recordkeeping and Reporting													
Recordkeeping	§112.8(c)(3)(iv), §112.12(c)(3)(iv) §112.7(e) §112.8(c)(6), §112.12(c)(6)	One-time expenditure							$200			$300	$500
		Annual cost			5								$268
Report a discharge if experienced a discharge that was required to be reported under §112.4(a). Provide a copy of all the information that you	§112.4(a) 112.4(c) §112.3(f)(2) §112.3(f)(3)	Annual labor		1	1								$115

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Exhibit I-1
Unit Cost Inventory for New Category III Storage Facilities

Activity	Applicable Rule Provision	Sub-activity/ Description	Cost Varying Factor	Cost Estimates									
				Labor Hours					Capital	Other			Total
				Hours Managerial	Hours Technical	Hours Drafter	Hours Clerical	Hours Contractor	$XX.00	Other Unit	Other Rate	Other Fixed Cost	$XX.00
Unit Costs In-House				**$150**	**$120**	**$75**	**$55**	**$70**					
Unit Costs Professional				**$61**	**$54**	**$27**	**$27**	**$70**					
submitted to EPA to the appropriate state agency. Copy the Plan and send it to a Regional Administrator if the Regional Administrator requested a copy of the Plan to evaluate the extension request.		Mailing costs (annual)							$16				$16

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APPENDIX J

Calculation of Cost Savings

This appendix presents the detailed formulae used in calculating total compliance cost savings in Chapter 6 (Volume I of this report). Calculations for the cost savings from the following topics are discussed: hot-mix asphalt, farms, residential heating oil exemption, facility diagram, loading rack, Tier I Qualified Facilities, security, integrity testing, animal fats and vegetable oils (AFVO), oil production sector, flow-through process vessels, small production facilities with marginal wells, produced water storage containers, and nuclear power stations.

Hot-Mix Asphalt

<u>Alternative Option to Exempt Hot-Mix Asphalt (HMA) Containers</u>

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-1 describes the calculation of net benefits in year *n* (NB_n).

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Exhibit J-1
Calculation of Cost Savings from Exempting Hot-Mix Asphalt Containers

Size Category	Before Change	After Change
Number of Existing Facilities[1]		
Category I	$NFacExist_{In}$	$NFacExist_{In}*0.7+ NFacExist_{IIn}*0.3$
Category II	$NFacExist_{IIn}$	$NFacExist_{IIn}*0.7+NFacExist_{IIIn}*0.3$
Category III	$NFacExist_{IIIn}$	$NFacExist_{IIIn}*0.7+NFacExist_{IVn}*0.6$
Category IV	$NFacExist_{IVn}$	$NFacExist_{Ivn}*0.4$
Number of New Facilities[1]		
Category I	$NFacNew_{In}$	$NFacNew_{In}*0.7+ NFacNew_{Iin}*0.3$
Category II	$NFacNew_{IIn}$	$NFacNew_{Iin}*0.7+NFacNew_{IIIn}*0.3$
Category III	$NFacNew_{IIIn}$	$NFacNew_{IiIn}*0.7+NFacNew_{IVn}*0.6$
Category IV	$NFacNew_{IVn}$	$NFacNew_{Ivn}*0.4$
Cost of Compliance (Existing)		
Category I	$CostExist^0_{In} = NFacExist_{In} * NCostExist_I * Overlap_I$	$CostExist^1_{In} = (NFacExist_{In} * 0.7 + NFacExist_{IIn} 0.3) * NCostExist_I * Overlap_I$
Category II	$CostExist^0_{IIn} = NFacExist_{IIn} * NCostExist_{II} * Overlap_{II}$	$CostExist^1_{IIn} = (NFacExist_{IIn} * 0.7 * NCostExistStay_{II} + NFacExist_{IIIn} * 0.3 * NCostExist_{II}) * Overlap_{II}$
Category III	$CostExist^0_{IIIn} = NFacExist_{IIIn} * NCostExist_{IIIi} * Overlap_{IIIi}$	$CostExist^1_{IIIn} = (NFacExist_{IIIn} * NCostExistStay_{III} * 0.7 + NFacExist_{IVn} * NCostExist_{III} * 0.6) * Overlap_{III}$
Category IV	$CostExist^0_{IVn} = NFacExist_{IVn} * NCostExist_{IV} * Overlap_{IV}$	$CostExist^1_{IVn} = NFacExist_{IVn} * NCostExistStay_{IV} * Overlap_{IV} * 0.4$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostExist^0_{In}$	$\sum_{i=I}^{IV} CostExist^1_{In}$
Cost of Compliance (New)		
Category I	$CostNew^0_{In} = NFacNew_{In} * NCostNew_I * Overlap_I$	$CostNew^1_{In} = (NFacNew_{In} * 0.7 + NFacNew_{IIn} * 0.3) * NCostNew_I * Overlap_I$
Category II	$CostNew^0_{IIn} = NFacNew_{IIn} * NCostNew_{II} * Overlap_{II}$	$CostNew^1_{IIn} = (NFacNew_{IIn} * NCostNewStay_{II} * 0.7 + NFacNew_{IIIn} * NCostNew_{II} * 0.3) * Overlap_{II}$

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Exhibit J-1
Calculation of Cost Savings from Exempting Hot-Mix Asphalt Containers

Size Category	Before Change	After Change
Category III	$CostNew^{0}_{IIIn} = NFacNew_{IIIn} * NCostNew_{IIIi} * Overlap_{IIIi}$	$CostNew^{1}_{IIIn} = (NFacExist_{IIIn} * NCostExistStay_{III} * 0.7 + NFacExist_{IVn} * NCostExist_{III} * 0.6) * Overlap_{III}$
Category IV	$CostNew^{0}_{IVn} = NFacExist_{IVn} * NCostExist_{IV} * Overlap_{IV}$	$CostNew^{1}_{IVn} = NFacExist_{IVn} * NCostExistStay_{IV} * Overlap_{IV} * 0.4$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostExist^{0}_{in}$	$\sum_{i=I}^{IV} CostNew^{1}_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} (CostExist^{0}_{in} - CostExist^{1}_{in} + CostNew^{0}_{in} - CostNew^{1}_{in})$	

[1] EPA assumes that after the final amendment, 30 percent of facilities in Category I would no longer be subject to the SPCC rule; 30 percent of the facilities in Category II would move to Category I; 30 percent of facilities in Category III would move to Category IV; and 60 percent of facilities in Category IV would move to Category III.

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Where

$NFacExist_{in}$ = Number of existing HMA facilities in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-3 in Volume I)

$NFacNew_{in}$ = Number of new HMA facilities in size category *i* in period *n*; *i* = I…IV and *n* = 1…10. EPA assumes that after the final amendment, 30 percent of facilities in Category I would no longer be subject to the SPCC rule; 30 percent of the facilities in Category II would move to Category I; 30 percent of facilities in Category III would move to Category IV; and 60 percent of facilities in Category IV would move to Category III (see Exhibit 6-3 and Exhibit 6-4 in Volume I)

$NCostExist_i$ = Per-facility cost for existing HMA facilities in size category *i* (see Exhibit 6-6 in Volume I)

$NCostNew_i$ = Per-facility cost for new HMA facilities in size category *i* (see Exhibit 6-6 in Volume I)

$NCostExistStay_i$ = Cost savings from exempt containers for existing HMA facilities in size category *i* that do not move categories (see Exhibit 6-6 in Volume I)

$NCostNewStay_i$ = Cost savings from exempt containers for new HMA facilities in size category *i* that do not move categories (see Exhibit 6-6 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

<u>Alternative Option to Exempt Asphalt Cement</u>

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-2 describes the calculation of net benefits in year *n* (NB_n).

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Exhibit J-2
Calculation of Cost Savings from Exempting Asphalt Cement

Size Category	Before Change	After Change
Number of Existing Facilities[1]		
Category I	$NFacExist_{In}$	$NFacExist_{In}*0.33+NFacExist_{IIn}$
Category II	$NFacExist_{IIn}$	$NFacExist_{IIIn}*0.66$
Category III	$NFacExist_{IIIn}$	$NFacExist_{IIIn}*0.33+NFacExist_{IVn}$
Category IV	$NFacExist_{IVn}$	0
Number of New Facilities[1]		
Category I	$NFacNew_{In}$	$NFacNew_{Iin}*0.33+NFacExist_{IIn}$
Category II	$NFacNew_{IIn}$	$NFacNew_{IIIn}*0.66$
Category III	$NFacNew_{IIIn}$	$NFacNew_{IIIn}*0.33+NFacNew_{IVn}$
Category IV	$NFacNew_{IVn}$	0
Cost of Compliance (Existing)		
Category I	$CostExist^0_{In} = NFacExist_{In} * NCostExist_I * Overlap_I$	$CostExist^1_{In} = (NFacExist_{IIn} * NCostExist_I * 0.33 + NFacExist_{In*}NCostExistStay_{In}) * Overlap_I$
Category II	$CostExist^0_{IIn} = NFacExist_{IIn} * NCostExist_{II} * Overlap_{II}$	$CostExist^1_{In} = NFacExist_{IIIn} * NCostExist_{II} * 0.66 * Overlap_{II}$
Category III	$CostExist^0_{IIIn} = NFacExist_{IIIn} * NCostExist_{IIIi} * Overlap_{IIIi}$	$CostExist^1_{IIIn} = (NFacExist_{IIIn} * NCostExistStay_{III} * 0.33 + NFacExist_{IVn} * NCostExist_{III}) * Overlap_{III}$
Category IV	$CostExist^0_{IVn} = NFacExist_{IVn} * NCostExist_{IV} * Overlap_{IV}$	0
Total Cost of Compliance	$\sum_{i=I}^{IV} CostExist^0_{In}$	$\sum_{i=I}^{IV} CostExist^1_{In}$
Cost of Compliance (New)		
Category I	$CostNew^0_{In} = NFacNew_{In} * NCostNew_I * Overlap_I$	$CostNew^1_{In} = (NFacNew_{IIn} * NCostNew_I * 0.33 + NFacNew_{In*}NCostNewStay_{In}) * Overlap_I$
Category II	$CostNew^0_{IIn} = NFacNew_{IIn} * NCostNew_{II} * Overlap_{II}$	$CostNew^1_{IIn} = NFacNew_{IIIn} * NCostNew_{II} * 0.66 * Overlap_{II}$

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Exhibit J-2
Calculation of Cost Savings from Exempting Asphalt Cement

Size Category	Before Change	After Change
Category III	$CostNew^{0}_{IIIn} = NFacNew_{IIIn} * NCostNew_{IIIi} * Overlap_{IIIi}$	$CostNew^{1}_{IIIn} = (NFacNew_{IIIn} * NCostNewStay_{III} * 0.33 + NFacNew_{IVn} * NCostNew_{III}) * Overlap_{III}$
Category IV	$CostNew^{0}_{IVn} = NFacExist_{IVn} * NCostExist_{IV} * Overlap_{IV}$	0
Total Cost of Compliance	$\sum_{i=I}^{IV} CostExist^{0}_{in}$	$\sum_{i=I}^{IV} CostNew^{1}_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} (CostExist^{0}_{in} - CostExist^{1}_{in} + CostNew^{0}_{in} - CostNew^{1}_{in})$	

[1] EPA assumes that after the final amendment, 66 percent of facilities in Category I would no longer be subject to the SPCC rule; 100 percent of the facilities in Category II would move to Category I; 66 percent of facilities in Category III would move to Category IV; and all facilities in Category IV would move to Category III.

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Where

$NFacExist_{in}$ = Number of existing asphalt cement facilities in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-3 in Volume I)

$NFacNew_{in}$ = Number of new asphalt cement facilities in size category *i* in period *n*; *i* = I…IV and *n* = 1…10. EPA assumes that after the final amendment, 66 percent of the facilities in Category I would no longer be subject to the SPCC rule; 100 percent of the facilities in Category II would move to Category I; 66 percent of facilities in Category III would move to Category II; and 100 percent of facilities in Category IV would move to Category III. (see Exhibit 6-4 and Exhibit 6-11 in Volume I)

$NCostExist_i$ = Per-facility cost for existing asphalt cement facilities in size category *i* (see Exhibit 6-6 in Volume I)

$NCostNew_i$ = Per-facility cost for new asphalt cement facilities in size category *i* (see Exhibit 6-6 in Volume I)

$NCostExistStay_i$ = Cost savings from exempt containers for existing asphalt cement facilities in size category *i* that do not move categories (see Exhibit 6-6 in Volume I)

$NCostNewStay_i$ = Cost savings from exempt containers for new asphalt cement facilities in size category *i* that do not move categories (see Exhibit 6-6 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Farms

Exemption of Pesticide Application Equipment

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-3 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-3
Calculation of Cost Savings from Exempting Pesticide Application Equipment

Size Category	After Final Changes
Number of Farms	
Category I	$NFacNew_{In} + NFacExist_{In}$
Category II	$NFacNew_{IIn} + NFacExist_{IIn}$
Category III	$NFacNew_{IIIn} + NFacExist_{IIIn}$
Category IV	$NFacNew_{IVn} + NFacExist_{IVn}$
Cost Savings (New and Existing)[1]	
Category I	$CostS_{In} = (NFacNew_{In} + NFacExist_{In}) * NCostS_I * Overlap_I$
Category II	$CostS_{IIn} = (NFacNew_{IIn} + NFacExist_{IIn}) * NCostS_{II} * Overlap_{II}$
Category III	$CostS_{IIIn} = (NFacNew_{IIIn} + NFacExist_{IIIn}) * NCostS_{III} * Overlap_{III}$
Category IV	$CostS_{IVn} = (NFacNew_{IVn} + NFacExist_{IVn}) * NCostS_{IV} * Overlap_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostS_{in}$
Net Benefit in year *n*	$CostS$

[1] Cost savings were the same for new and existing facilities.

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Where

$NFacExist_{in}$ = Number of existing farms in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-14 in Volume I)

$NFacNew_{in}$ = Number of new farms in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-14 in Volume I)

$NCostS_i$ = Farm-level cost savings for new and existing farms in size category *i* (see Exhibit 6-15 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

<u>Alternative to Exempt Farms</u>

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-4 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-4
Calculation of Cost Savings from Exempting Farms

Size Category	Cost Savings
Number of Existing Facilities	
Category I	$NFacExist_{In}$
Category II	$NFacExist_{IIn}$
Category III	$NFacExist_{IIIn}$
Category IV	$NFacExist_{IVn}$
Number of New Facilities	
Category I	$NFacNew_{In}$

Exhibit J-4
Calculation of Cost Savings from Exempting Farms

Size Category	Cost Savings
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (Existing)[1]	
Category I	$CostExist^0_{In} = NFacExist_{In} * NCostExist_I * Overlap_I$
Category II	$CostExist^0_{IIn} = NFacExist_{IIn} * NCostExist_{II} * Overlap_{II}$
Category III	$CostExist^0_{IIIn} = NFacExist_{IIIn} * NCostExist_{IIIi} * Overlap_{IIIi}$
Category IV	$CostExist^0_{IVn} = NFacExist_{IVn} * NCostExist_{IV} * Overlap_{IV}$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostExist^0_{In}$
Cost Savings (New)[2]	
Category I	$CostNew^0_{In} = (NCostNewLow_I * 0.25 + NCostNewMed_I * 0.5 + NCostNewHigh_I * 0.25 + 0.1 * Buried_I)$ $* NFacNew_i * Overlap_I$
Category II	$CostNew^0_{IIn} = (NCostNewLow_{II} * 0.25 + NCostNewMed_{II} * 0.5 + NCostNewHigh_{II} * 0.25 + 0.1 * Buried_{II})$ $* NFacNew_{IIn} * Overlap_{II}$
Category III	$CostNew^0_{IIIn} = (NCostNewLow_{III} * 0.25 + NCostNewMed_{III} * 0.5 + NCostNewHigh_{III} * 0.25 + 0.1 * Buried_{III})$ $* NFacNew_{IIIn} * Overlap_{IIIi}$
Category IV	$CostNew^0_{IVn} = NCostNewLow_{IV} * 0.25 + NCostNewMed_{IV} * 0.5 + NCostNewHigh_{IV} * 0.25 + 0.1 * Buried_{IV})$ $* NFacNew_{IVn} * Overlap_{IV}$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostNew^0_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} (CostExist^0_{in} + CostNew^0_{in})$

1 Existing farms only save on recurring costs of compliance with SPCC.

2 New farms save on one-time and recurring costs. The high estimate is for a concrete secondary containment, the medium estimate is for an earthen berm for secondary containment, and the low estimate assumes that farms use creative methods that have no cost. EPA assumed that 50 percent of farms incur medium costs, 25 percent incur the low estimate, and 25 percent incur the high estimate. Further, the Agency assumed that 10 percent of the farms have partially buried tanks and incur the cost of compliance for these.

Where

$NFacExist_{in}$ = Number of existing farms in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-21 in Volume I)

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$NCostExist_i$ = Farm-level cost for existing farms in size category *i* (see Exhibit 6-22 in Volume I)

$NCostNewMed_i$ = Farm-level cost for new farms in size category *i* that install an earthen secondary containment (see Exhibit 6-22 in Volume I); assume 50% of farms incur this cost.

$NCostNewLow_i$ = Farm-level cost for new farms in size category *i* that install a cost-free creative secondary containment (see Exhibit 6-22 in Volume I); assume 25% of farms incur this cost.

$NCostNewHigh_i$ = Farm-level cost for new farms in size category *i* that install a concrete secondary containment (see Exhibit 6-22 in Volume I); assume 25% of farms incur this cost.

$Buried_i$ = Cost of a partially buried tank (see Exhibit 6-22 in Volume I); assume 10% of all farms have partially buried tanks.

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Residential Oil Exemption

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-5 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-5
Calculation of Cost Savings from Exempting Residential Oil

Size Category	After Final Changes
Number of New Farms	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Number of Existing Farms	
Category I	$NFacExist_{In}$
Category II	$NFacExist_{IIn}$
Category III	$NFacExist_{IIIn}$
Category IV	$NFacExist_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} + *NCostSNew_{III} * Overlap_{III}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Cost Savings (Existing)	
Category I	$CostSExist_{In} = NFacExist_{In} * NCostSExist_{I} * Overlap_{I}$

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Exhibit J-5
Calculation of Cost Savings from Exempting Residential Oil

Size Category	After Final Changes
Category II	$CostSExist_{IIn} = NFacExist_{IIn} * NCostSExist_{II} * Overlap_{II}$
Category III	$CostSExist_{IIIn} = NFacExist_{IIIn} * NCostSExist_{III} * Overlap_{III}$
Category IV	$CostSExist_{IVn} = NFacExist_{IVn} * NCostSExist_{IV} * Overlap_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostSExist_{in} + CostSNew_{in}$
Net Benefit in year *n*	$CostS$

Where

$NFacExist_{in}$ = Number of existing farms in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-21 in Volume I)

$NFacNew_{in}$ = Number of new farms in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-21 in Volume I)

$NCostSNew_i$ = Farm-level cost savings for new farms in size category *i* (see Exhibit 6-22 in Volume I)

$NCostSExist_i$ = Farm-level cost savings for existing farms in size category *i* (see Exhibit 6-22 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Facility Diagram

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-6 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-6
Calculation of Cost Savings from Amendments in Facility Diagram Requirements

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	$CostS$

[1] Only new facilities incur cost savings.

Where

$NFacNew_{in}$ = Number of new facilities in size category *i* in period *n*

$NCostSNew_{i}$ = Cost savings for new facilities in size category *i* from simplified representation of mobile/portable containers in the facility diagram (see Exhibit 6-25 in Volume I)

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$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Loading Rack

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-7 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-7
Calculation of Cost Savings from Loading Rack Amendments

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{Ink}$
Category II	$NFacNew_{IInk}$
Category III	$NFacNew_{IIInk}$
Category IV	$NFacNew_{IVnk}$
Number of Existing Facilities	
Category I	$NFacExist_{Ink}$
Category II	$NFacExist_{IInk}$
Category III	$NFacExist_{IIInk}$
Category IV	$NFacExist_{IVnk}$
Cost Savings (New)	
Category I	$CostSNew_{Ink} = NFacNew_{Ink} * NCostSNew_{Ik} * Overlap_{I}$
Category II	$CostSNew_{IInk} = NFacNew_{IInk} * NCostSNew_{IIk} * Overlap_{II}$
Category III	$CostSNew_{IIInk} = NFacNew_{IIInk} * NCostSNew_{IIIk} * Overlap_{III}$
Category IV	$CostSNew_{IVnk} = NFacNew_{IVnk} * NCostSNew_{IVk} * Overlap_{IV}$
Total Cost Savings	$\sum_{i=I}^{IV} \sum_{k=1}^{3} CostSNew_{ink}$
Cost Savings (Existing)	
Category I	$CostSExist_{Ink} = NFacExist_{Ink} * NCostSExist_{Ik} * Overlap_{I}$
Category II	$CostSExist_{IInk} = NFacExist_{IInk} * NCostSExist_{IIk} * Overlap_{II}$

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Exhibit J-7
Calculation of Cost Savings from Loading Rack Amendments

Size Category	After Final Changes
Category III	$CostSExist_{IIInk} = NFacExist_{IIInk} * NCostSExist_{IIIk} * Overlap_{III}$
Category IV	$CostSExist_{IVnk} = NFacExist_{IVnk} * NCostSExist_{IVk} * Overlap_{IV}$
Total Cost Savings	$\sum_{i=I}^{IV}\sum_{k=1}^{3} CostSExist_{ink}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostSNew_{in}$

Where

k = 1,2,3 are industries AFVO, Farms, and Oil Production

$NFacNew_{ink}$ = Number of new affected facilities in size category *i* in period *n* and industry *k* (see Exhibit 6-27 in Volume I)

$NCostSNew_{ik}$ = Cost savings for new affected facilities in size category *i* and industry k (see Exhibit 6-30 in Volume I)

$NFacExist_{ink}$ = Number of existing affected facilities in size category *i* in period *n* and industry *k* (see Exhibit 6-27 in Volume I)

$NCostSExist_{ik}$ = Cost savings for existing affected facilities in size category *i* and industry k (see Exhibit 6-30 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Tier I Qualified Facilities

Exempt Facilities with no Containers Larger Than 5,000 Gallons

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-8 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-8
Calculation of Cost Savings from Tier I Qualified Facilities Exemption

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings	$\sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostSNew_{in}$

[1] Only new facilities incur cost savings.

Where

$NFacNew_{in}$ = Number of new qualified Tier I facilities in size category *i* in period *n* (see Exhibit 6-32 in Volume I)

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$NCostSNew_i$ = Cost savings for new qualified Tier I facilities in size category *i* (see Exhibits 6-35 and 6-36 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

Exempt Facilities with Storage Capacity Less Than or Equal to 5,000 Gallons

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$, *r* = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-9 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-9
Calculation of Cost Savings from Tier I Qualified Facilities Exemption

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings	$\sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostSNew_{in}$

[1] Only new facilities incur cost savings.

Where

$NFacNew_{in}$ = Number of new qualified Tier I facilities in size category *i* in period *n* (see Exhibit 6-32 in Volume I)

$NCostNew_i$ = Cost savings for new qualified Tier I facilities in size category *i* (see Exhibits 6-35 and 6-36 in Volume I)

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$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Security

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-10 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-10
Calculation of Cost Savings from Amendments in Security Requirements

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings[2]	
Low Scenario	$CostSLow = \sum_{i=I}^{IV} CostSNew_{in} * 0.5$
Medium Scenario	$CostSMed = \sum_{i=I}^{IV} CostSNew_{in} * 0.75$
High Scenario	$CostSHigh = \sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	CostSLow; CostSMed; CostSHigh

1 Only new facilities incur cost savings.

2 The low scenario assumes that only 50 percent of facilities would have claimed environmental equivalence and would hence save from the new amendment; the medium scenario assumes that 75 percent of facilities would save, and the high scenario assumes that 100 percent of facilities would save.

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Where

$NFacNew_{in}$ = Number of new facilities in size category *i* in period *n* (see Exhibit 6-40 in Volume I)

$NCostSNew_i$= Cost savings for new facilities in size category *i* from not requiring environmental equivalence of security measures (see Exhibit 6-41 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Integrity Testing

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-11 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-11
Calculation of Cost Savings from Amendments in Integrity Testing Requirements

Size Category	After Final Changes
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	*CostS*

[1] Only new facilities incur cost savings.

Where

$NFacNew_{in}$ = Number of new facilities in size category *i* in period *n* (see Exhibit 6-43 in Volume I)

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$NCostSNew_i$= Cost savings for new facilities in size category *i* from for not having to claim environmental equivalence for integrity testing (see Section 6.11.2 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Animal Fats and Vegetable Oils

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$, *r* = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-12 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-12
Calculation of Cost Savings from Amendments to AFVO Facilities

Size Category	After Final Changes
Number of Existing Facilities	
Category I	$NFacExist_{In}$
Category II	$NFacExist_{IIn}$
Category III	$NFacExist_{IIIn}$
Category IV	$NFacExist_{IVn}$
Number of New Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New and Existing)[1]	
Category I	$CostSNew_{In} = (NFacExist_{In} + NFacNew_{In}) * NCostS_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = (NFacExist_{IIn} + NFacNew_{IIn}) * NCostS_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = (NFacExist_{IIIn} + NFacNew_{IIIn}) * NCostS_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = (NFacExist_{IVn} + NFacNew_{IVn}) * NCostS_{IV} * Overlap_{IV}$
Total Cost Savings[2]	
Low Scenario	$CostSLow = \sum_{i=I}^{IV} CostSNew_{in} * 0.45$
Medium Scenario	$CostSMed = \sum_{i=I}^{IV} CostSNew_{in} * 0.65$
High Scenario	$CostSHigh = \sum_{i=I}^{IV} CostSNew_{in} * 0.9$
Net Benefit in year *n*	*CostSLow; CostSMed; CostSHigh*

1 Cost savings for new and existing facilities is the same.

2 The low scenario assumes that only 50 percent of facilities would have claimed environmental equivalence and would hence save from the new amendment; the medium scenario assumes that 75 percent of facilities would save, and the high scenario assumes that 100 percent of facilities would save.

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Where

$NFacnew_{in}$ = Number of new AFVO facilities in size category *i* in period *n* (see Exhibit 6-45 in Volume I)

$NFacExist_{in}$ = Number of existing AFVO facilities in size category *i* in period *n* (see Exhibit 6-45 in Volume I)

$NCostS_i$ = Cost savings for new and existing AFVO facilities in size category *i* from not having to do integrity testing (see Exhibit 6-48 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Oil Production Sector

SPCC Oil Preparation and Implementation

Six-Month Delay

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-13 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-13
Calculation of Cost Savings from Amendments in SPCC Oil Preparation and Implementation Requirements (Six-Month Delay)

Size Category	After Final Changes
Number of New Production Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost of Compliance (New)[1]	
Category I	$CostNew_{In} = NFacNew_{In} * (NCostNew_{I}) * Overlap_{I}$
Category II	$CostNew_{IIn} = NFacNew_{IIn} * (NCostNew_{II}) * Overlap_{II}$
Category III	$CostNew_{IIIn} = NFacNew_{IIIn} * (NCostNew_{III}) * Overlap_{IIIi}$
Category IV	$CostNew_{IVn} = NFacNew_{IVn} * (NCostNew_{IV}) * Overlap_{IV}$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostNew_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostNew_{in}$

[1] Only new production facilities are affected; 50 percent of new facilities use in-house labor for plan amendments and 50 percent use outside labor..

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Where

$NFacNew_{in}$ = Number of new production facilities in size category *i* in period *n* (see Exhibit 6-50 in Volume I)

$NCostNewIn_i$ = Cost of Plan amendment for new production facilities in size category *i* (see Exhibit 6-55 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

Twelve-Month Delay

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$, *r* = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-14 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-14
Calculation of Cost Savings from Amendments in SPCC Oil Preparation and Implementation Requirements (12-Month Delay)

Size Category	After Final Changes
Number of New Production Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost of Compliance (New)[1]	
Category I	$CostNew_{In} = NFacNew_{In} * (NTotCost_I) * Overlap_I$
Category II	$CostNew_{IIn} = NFacNew_{IIn} * (NTotCost_{II}) * Overlap_{II}$
Category III	$CostNew_{IIIn} = NFacNew_{IIIn} * (NTotCost_{III}) * Overlap_{IIIi}$
Category IV	$CostNew_{IVn} = NFacNew_{IVn} * (NTotCost_{IV}) * Overlap_{IV}$
Total Cost of Compliance	$\sum_{i=I}^{IV} CostNew_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostNew_{in}$

[1] Only new production facilities are affected; 50 percent of new facilities use in-house labor for plan amendments and 50 percent use outside labor.

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Where

$NFacNew_{in}$ = Number of new production facilities in size category *i* in period *n* (see Exhibit 6-55 in Volume I)

$NTotCost_i$ = Facility-level cost of compliance for new production facilities in size category *i* (see Exhibit 6-56 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Flow-through Process Vessels

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-15 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-15
Calculation of Cost Savings from Amendments in Flow-through Process Vessels

Size Category	After Final Changes
Number of New Production Facilities	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings (New)[1]	
Category I	$CostSNew_{In} = NFacNew_{In} * NCostSNew_{I} * Overlap_{I}$
Category II	$CostSNew_{IIn} = NFacNew_{IIn} * NCostSNew_{II} * Overlap_{II}$
Category III	$CostSNew_{IIIn} = NFacNew_{IIIn} * NCostSNew_{IIIi} * Overlap_{IIIi}$
Category IV	$CostSNew_{IVn} = NFacNew_{IVn} * NCostSNew_{IV} * Overlap_{IV}$
Total Cost Savings	$\sum_{i=I}^{IV} CostSNew_{in}$
Net Benefit in year *n*	$\sum_{i=I}^{IV} CostSNew_{in}$

[1] Only new facilities incur cost savings. Assumes that only one heater-treater is outside the tank battery for new production facilities in all size categories.

Where

$NFacNew_{in}$ = Number of new production facilities in size category *i* in period *n* (see Exhibit 6-62 in Volume I)

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$NCostSNew_i$ = Cost difference between general and sized secondary containment around heater-treater is $800 for all new production facilities in all size categories (see Section 6.13.7.2 in Volume I)

$Overlap_i$ = 1 - estimated percentage reduction in total burden due to state overlap for size category *i* (see Exhibit 5-22 in Volume I)

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Streamlined Requirements for Small Production Facilities with Marginal Wells

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

$$PVC = \sum_{n=1}^{10} NB_n$$

Exhibit J-16 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-16
Calculation of Cost Savings from Small Production Facilities with Marginal Wells

Size Category	After Final Changes
Number of New Production Facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells	
Category I	*0*
Category II	$NMarFacNew_{IIn}$
Category III	$NMarFacNew_{IIIn}$
Category IV	$NMarFacNew_{IVn}$
Number of Existing Production Facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells	
Category I	*0*
Category II	$NMarFacExist_{IIn}$
Category III	$NMarFacExist_{IIIn}$
Category IV	$NMarFacExist_{IVn}$
Cost Savings	
Category I	$CostS_{In} = 0$
Category II	$CostS_{IIn} = (NMarFacNew_{IIn}) * NCostSNew_{II} + NMarFacExist_{IIn} * NCostSExist_{II}$
Category III	$CostS_{IIIn} = (NMarFacNew_{IIIn}) * NCostSNew_{III} + NMarFacExist_{IIIn} * NCostSExist_{III}$

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Category IV	$CostS_{IVn} = (NMarFacNew_{IVn}) * NCostSNew_{IV} + NMarFacExist_{IVn} * NCostSExist_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostS_{in}$
Net Benefit in year *n*	$CostS$

Where

$NMarFacNew_{in}$ = Number of new production facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-72 in Volume I)

$NMarNewExempt_{in}$ = Number of existing production facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-72 in Volume I)

$NCostSNew_i$ = Facility-level cost savings (PE certification cost) for new production facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells and no injection wells in size category *i* (see Exhibit 6-73 in Volume I) in the first year

$NCostSExist_i$ = Facility-level cost savings (PE recertification cost) for new production facilities with no injection wells and no more than 4 marginal wells or facilities with injection wells and no more than 2 marginal wells in size category *i* (see Exhibit 6-73 in Volume I) in the first year

Note: Facilities in Category I are not eligible for additional cost savings as a result of the rule.

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Nuclear Power Stations

Exemption of Underground Emergency Diesel Generator Tanks

Average Annualized Cost Savings (AC) = $AC = PVC \times \frac{r \times (1+r)^{10}}{(1+r)^{10} - 1}$,

Where

PVC = present value of costs

r = discount rate

PVC = $\sum_{n=1}^{10} NB_n$

Exhibit J-17 describes the calculation of net benefits in year *n* (NB_n).

Exhibit J-17
Calculation of Cost Savings from Exempting Underground Emergency Diesel Generator Tanks

Size Category	After Final Changes
Number of New Nuclear Power Stations	
Category I	$NFacNew_{In}$
Category II	$NFacNew_{IIn}$
Category III	$NFacNew_{IIIn}$
Category IV	$NFacNew_{IVn}$
Cost Savings	
Category I	$CostS_{In} = (NFacNew_{In}) * NCostS_{I}$
Category II	$CostS_{IIn} = (NFacNew_{IIn}) * NCostS_{II}$
Category III	$CostS_{IIIn} = (NFacNew_{IIIn}) * NCostS_{III}$
Category IV	$CostS_{IVn} = (NFacNew_{IVn}) * NCostS_{IV}$
Total Cost Savings	
Total Cost Savings	$CostS = \sum_{i=I}^{IV} CostS_{in}$
Net Benefit in year *n*	$CostS$

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Where

$NFacNew_{in}$ = Number of new nuclear power stations in size category *i* in period *n*; *i* = I…IV and *n* = 1…10 (see Exhibit 6-81 in Volume I)

$NCostS_i$ = Facility-level cost savings for new nuclear power stations in size category *i* (see Section 6.15.3 in Volume I)

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APPENDIX K

Hypothetical Facility Profiles

The cost of compliance with the SPCC rule for a facility is based on specific assumptions on the number of tanks, the total capacity, and other facility characteristics. These costs are meant to be illustrative and not representative of average cost at a facility. The estimates are the average of facility-level cost using in-house labor and outside labor. This appendix provides the hypothetical SPCC-regulated facility profiles for the following hypothetical facilities: an onshore oil production facility (marginal), an onshore oil production facility, farms, an animal fats and vegetable oils facility, and an asphalt facility.

Hypothetical Facility Profile: Onshore Oil Production Facility – Marginal (NAICS 211111)

This appendix presents facility characteristics, relevant compliance items, the cost of complying with the 2002 SPCC rule requirements, and the cost savings from the final amendments to the SPCC rule for a range of illustrative marginal onshore oil production facilities. Because the term "marginal" typically applies to wells and not production facilities, the first step in describing the characteristics of an onshore oil production facility with marginal production involves establishing a methodology for identifying marginal production as it relates to an oil production facility. Onshore oil production facilities typically include more than one well, and the number of wells connected to a tank battery has implications for storage capacity needs.

Methodology

A well is characterized as "marginal" if the rate of production is such that the well is at the limit of being profitable. The production rate for which this happens depends on operating costs, product prices, tax rates, debt service, environmental compliance costs, and liabilities. The Independent Petroleum Association of America (IPAA) estimates that the profitability point is about $18 per barrel (2004).[30] The average wellhead price in 2004 was $36.77 per barrel.[31]

Despite the variations in the factors determining economic profitability, general definitions and thresholds for marginal production have been established based on well productivity. The Interstate Oil and Gas Compact Commission (IOGCC) defines a "stripper well" as one that produces 10 barrels of oil per day or less.[32] The Department of Energy (DOE), in addition to the 10 barrels per day threshold, uses a slightly higher threshold, defining stripper wells as those producing 15 barrels of oil per day or less.[33] The DOE threshold is consistent with the Internal Revenue Code, which defines a marginal well, for the purpose of enacting special percentage

[30] Stateline.org. "Oil sticker shock a windfall to energy-rich states." June 3, 2004 http://www.stateline.org/live/ViewPage.action?siteNodeId=136&languageId=1&contentId=15667.

[31] Independent Petroleum Association of America, IPAA Oil & Natural Gas Producing Industry In Your State. August 2007. http://www.ipaa.org/reports/econreports/IPAAOPI.pdf.

[32] DOE cites both thresholds in its publications. 2007 IOGCC report, Marginal Wells: Fuel for Economic Growth http://www.iogcc.state.ok.us/pdfs/2007_%20Marginal_%20Well_%20Report.pdf.

[33] http://www.fossil.energy.gov/programs/oilgas/marginalwells/index.html.

depletion provisions for oil production, as one that produces 15 barrels or less per day of heavy oil.[34]

In this hypothetical facility profile, EPA used the IOGCC threshold of 10 barrels per day to define marginal wells, since the IOGCC gathers data on marginal wells and publishes an annual Marginal Well Report. According to data provided by the Energy Information Administration (EIA) from the U.S. PetroSystem[35] 2004 study "Distribution of Oil and Gas Wells and Production Project" (hereafter "2004 PetroSystem Report"), 76.6 percent of U.S. domestic oil wells produce marginally, at a rate less than 10 barrels oil per day. The 2004 PetroSystem Report identifies the number of wells per state by production rate. Because a definition for a marginal oil production facility does not exist, there are no data on facilities in relation to marginal production. Therefore, for the purpose of this hypothetical facility profile, characteristics and data are only included from states with a higher percentage of marginal wells than the national average. It is assumed that facilities from states with a higher percentage of marginal production would have characteristics of marginal onshore oil production facilities.

Exhibit K-1 summarizes data from the 2004 PetroSystem Report. The states included in Exhibit K-1 cover 80.1 percent of the marginal wells in the United States (206,359 wells out of a total of 257,539 wells). Notably missing from the exhibit are the states of Pennsylvania and Tennessee. The IOGCC estimated that Pennsylvania had oil production from 16,061 wells in 2004.[36] Based on personal communication with EPA Region 3, Pennsylvania is similar to Ohio and New York, and 99 percent of wells can be assumed to be marginal. No state data could be found for Tennessee.

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[34] 1986, Title 26, Subtitle A, Chapter 1, Subchapter 1, Part 1, Section 613A.

[35] U.S. PetroSystem, formed in the spring of 2000, is a cooperative multi-agency program established for the creation, maintenance, and sharing of data used in the study of domestic and worldwide oil and gas resources, reserves, production, productive capacity, and their associated technologies and economics. These agencies support this work not only for the cost effectiveness and efficiency gained from pooling their resources but also for the shared knowledge gained from cooperation. At present, the U.S.PetroSystem member organizations include the EIA, the National Energy Technology Laboratory, and the United States Geological Survey (USGS). http://www.eia.doe.gov/pub/oil_gas/petrosystem/petrosysog.html. Accessed 12/18/06.

[36] 2006 IOGCC Marginal Well Report. http://www.iogcc.state.ok.us/PDFS/2006-Full-Marginal-Well-Report.pdf.

Exhibit K-1
Number and Percentage of Marginal Wells for States with a Percentage Higher Than the National Average

State	Number of Marginal Wells[1,2]	Percentage of Total Wells that Are Marginal
Arkansas	1,510	78.7%
Arizona	18	90.0%
Illinois	4,900	90.4%
Indiana	999	90.7%
Kansas	32,500	96.4%
Kentucky	935	93.5%
Louisiana	13,500	80.6%
Michigan	2,980	90.3%
Nebraska	1,050	88.7%
New York	2,790	99.8%
Ohio	11,600	99.0%
Oklahoma	35,000	92.6%
Texas	95,000	76.7%
Virginia	7	100%
West Virginia	3,560	98.1%
Total	**206,000**	**--**
United States	**258,000**	**76.6%**

[1] The 2004 PetroSystem Report provides data on the national average for well production. Facility-based data, such as storage capacity and number of wells, are taken from personal communication with Richard Franklin, Federal On-Scene Coordinator for EPA Region 6. These two EPA Regions include the majority of marginal wells.

[2] Production facilities account for 29 percent of the total "Estimated Universe of SPCC-Regulated Facilities." This hypothetical facility is representative of the Appalachia/Illinois Basin and Central/Midwest regions of the United States, where typical marginal facilities' total storage is on average 8,400 gallons and 34,000 gallons, respectively, and as such is illustrative of Category I and Category II facilities.

Source: 2004 PetroSystem Report.

Section I: Basic Facility Characteristics

Oil Types at the Facility:

Well Fluids (crude oil, water, sand and other formation components), Crude Oil, Produced Water (oil/water mixture).

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Production/Storage Areas:

- Wellheads. A typical facility in the lower Midwest has four oil wells (Low and high range: 1-10 wells).[37] Facilities in the Appalachian Basin typically have storage tanks at the well,[38] and therefore, the typical facility for this region is expected to have two or fewer oil wells (Low and high range: 1-10 wells). In both areas there are facilities with more than ten wells per facility, but they are atypical.
- Flowlines
- Tank battery (oil storage tanks, produced water tank, gun barrel, piping)
- Saltwater disposal well

Production/Storage Rates (per well per day):

Crude oil: 2.3 bbl (96.6 gallons); low-high range: 0.1-10 bbl (4.2-420 gallons)

Produced water: 23 bbl (966 gallons); range: 1-100 bbl (42-4,200 gallons)[39]

Produced Water Contents:
Oil/produced water mixture

Storage Capacity:

Appalachia or Illinois Basins
Total Storage: 8,400 gallon (200 bbl) (100-400 bbl). 90% of facilities are less than 10,000 gallons total. *Individual Storage:* ASTs: A typical facility has 2 tanks total at 4,200 gallons each (100 bbl) (range: 10-200 bbl). One tank is used for gravitational separation. Produced water tank: For multiple well facilities, typically have a produced water tank in the tank battery of 4,200 gallons (100 bbl) (100-200 bbl) Flowline size and length*:* 1.5-3 inches in diameter. 1,000 feet per facility (500-5,000 feet).

Central/Midwest
Total Storage: 34,500 gallons (820 bbl) (0.5-4 million bbl). 70 percent of facilities are less than 42,000 gallons. Almost all are greater than 10,000 gallons. *Individual Storage:* ASTs: A typical facility has 2 tanks at 8,400 gallons each (200 bbl) (range: 100-1000 bbl) Gun barrel: 4,200 gallons (100 bbl) (range: 34-750 bbl*)* Separators: 20 bbl (840 gallons) (range: 16-60 bbl*).* For larger facilities, the tank battery may also include a heater/treater. Typical size is 135 bbl (range: 75-250) Produced water tank: 17,000 gallons (400 bbl) (200-1000 bbl) Flowline size and length*:* 1.5-3 inches in diameter. 4,000 feet per facility (range: 1,000-30,000 feet).

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[37] The assumption used is four wells per facility based on personal communication with EPA Region 6 and the Texas Railroad Commission. Source for the average production rate: Energy Information Administration (EIA), Distribution of Wells by Production Rate Bracket, 2004.

[38] The assumption used is two wells per facility based on personal communication with EPA Region 3.

[39] The water-oil ratio used of 10:1 is a rough estimate of produced water volumes. Source: Sandia National Laboratories at http://www.sandia.gov/water/FactSheets/WIFS_ProducedWaterNew.pdf. Accessed June 24, 2008.

Potential Sources of Oil Discharges:

- Tank battery (crude oil storage tanks, produced water tank, gun barrel/other types of oil/water separator)
- Flowlines (between well and tank battery) and piping (on storage tanks, gun barrel and wells)
- Oil wells
- Saltwater disposal (piping/hoses, pumps, valves)
- Transfer and loading operations.

Section II: Cost Analysis of SPCC Requirements

This section presents the cost to this hypothetical facility of complying with the SPCC rule requirements. Exhibit K-2 presents the costs of compliance for each SPCC rule requirement applicable to marginal production facilities. In the table, a row is colored gray if the cost incurred is expected to change due to the proposed amendments. The total annualized cost of compliance includes the annualized value of all one-time initial investments that the facility has to make (fixed costs), such as secondary containment around bulk storage containers and the recurring annual cost related to inspections and training. EPA assumed different estimates for lifetime periods for various compliance activities: 20 years for all fixed structures (except earthen berms) and initial SPCC Plan, 10 years for earthen berms, and 5 years for PE certification (based on the rule requirement). To annualize the fixed costs, EPA used the Modified Accelerated Cost Recovery System[40] for determining the depreciation period for various compliance structures. Therefore, for the depreciation period, the Agency used the following estimates: 10 years for all fixed structures (except earthen berms) and initial SPCC Plan, 6 years for earthen berms and 5 years for PE certification.

Facility storage capacity has an impact on the cost of complying with the SPCC rule requirements. The capacity tiers are defined as follows: Category I (1,321-10,000 gallons); Category II (10,001 to 42,000 gallons); Category III (42,001 to 1,000,000 gallons); and Category IV (more than 1,000,000 gallons).[41] The cost estimates are based on specific assumptions for facility characteristics and are not expected to be representative of the cost of a typical production facility. Further, the estimates capture the variability in the cost (1) across facilities of different sizes within the same broad size category (e.g., a different number of storage containers and/or containers of different sizes) and (2) across different methods or materials used to comply with SPCC requirements (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank). However, these

[40] U.S. Department of the Treasury, Internal Revenue Service. "How to Depreciate Property." Publication 946, 2007. http://www.irs.gov/pub/irs-pdf/p946.pdf. Accessed June 24, 2008.

[41] Please refer to Section IV for assumptions regarding Category I and Category II production facility characteristics.

estimates do not take into account the geographical variability of regulated facilities. Therefore, these estimates only provide an illustrative example for facilities in each size category.

Furthermore, the cost savings from the final amendment are based on the assumption that for the flowline amendments, production facilities will choose the lower cost option and will demonstrate that their program is environmentally equivalent to the prescriptive requirements of the final amendment, rather than adopt the prescriptive requirements. The Agency expects that the cost of explaining why secondary containment is impracticable is likely to be similar to the cost of demonstrating in the Plan how the maintenance program is environmentally equivalent to the more prescriptive requirements of the final amendment.[42]

Exhibit K-2
Cost of Compliance with SPCC Requirements for Hypothetical Marginal Production Facility (2007$)[1] (7% discount rate)

Baseline Cost of SPCC Promulgation	Category I	Category II
SPCC Plan		
Prepare SPCC Plan[2]	$308	$617
Certification of SPCC Plan	$182	$365
Amendment of SPCC Plan	$201	$402
Re-certification due to amendments	$245	$491
Facility Drainage §112.9(b)		
Production/separation area[3]	$33	$33
Secondary Containment §112.7(c), §112.9(c)		
Bulk storage containers, produced water containers, separators/heater-treaters (Earthen berms)[4]	$485	$1,083
Bulk storage containers, produced water containers, separators/heater-treaters (Concrete berms)[4]	$1,640	$4,130
Piping (within tank battery) [5]	$399	$399
Transfer areas (other than loading/unloading racks)[6]	$953	$953
Intra-facility gathering lines[7]	$119	$356
Spill kits[8]	$78	$78
Other types of piping[9]	$156	$156
Oil-filled equipment[10]	$214	$214
Training §112.7(f)		
Prepare for and hold training. Describe trainings provided for facility personnel.[11]	$1,110	$2,160
Prepare for and hold discharge prevention briefings.[12]	$717	$1,390
Train a designated person responsible for discharge prevention.[13]	$107	$107
Testing/Inspections §112.9(b)(c)(d)		
Integrity testing for bulk containers, if secondary containment impracticable[14]	N/A	N/A

[42] Please refer to Section IV for assumptions regarding Category III and Category IV production facility characteristics.

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Exhibit K-2
Cost of Compliance with SPCC Requirements for Hypothetical Marginal Production Facility (2007$)[1] (7% discount rate)

Baseline Cost of SPCC Promulgation	Category I	Category II
Aboveground valves and piping[15]	$1,290	$2,570
Oil traps, sumps and skimmers[16]	$161	$322
Containment areas[17]	$161	$322
Saltwater disposal facilities[18]	$161	$322
Inspect diked areas[19]	$161	$322
Impracticability Determination §112.7(d)		
Flowlines[20]	$144	$287
Other Measures 112.9 (d) (3)		
Develop and implement a flowline maintenance program[21]	$560	$712
Discharge reporting[22]	$129	$129
Recordkeeping[23]	$300	$300
Total		
Total cost of complying with SPCC requirements (Earthen berms)[24]	**$8,370**	**$14,100**
Total cost of complying with SPCC requirements (Concrete berms)[24]	**$9,520**	**$17,100**
Average total cost of complying with SPCC requirements	**$8,940**	**$15,600**

1 The total cost of compliance is not the same as that used in Chapter 6 of Volume I of the RIA because this profile presents all possible costs that a facility can incur. The cost of compliance presented in Chapter 6 accounted for the percentage of facilities that face certain costs: amending the plan, discharge reporting.

2 Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; prepare a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency. Assume that a new facility already has an accurate facility diagram for its own purposes. The amendment that will allow a new production facility to delay preparation and implementation of an SPCC Plan is not expected to change the cost of compliance. (Source: SCS Engineers; see Appendix I.)

3 Drainage outside containment berms is designed to flow into drainage ditches. Drains are closed and sealed at all times except when draining rainwater. Cost includes 4 hours of contractor labor: 2 hours at $75 per hour and 2 hours at $45 per hour. (Source: SCS Engineers; see Appendix I.)

4 All facilities except those in Alaska will have separation installations (e.g., a heater-treater) within the tank battery. Thus, assume that a typical facility incurs no extra cost for secondary containment for separation installation, and the amendments will not result in any reduction in compliance cost. (Source: Considerations for the Regulation of Onshore Oil Exploration and Production Facilities Under the Spill Prevention, Control, and Countermeasure Regulation (40 CFR Part 112).)

5 Assume it is located within the berm. 1.5-3 inches in diameter. 1-10 feet in length. Only subject to integrity testing after an impracticability determination if associated with a storage tank without secondary containment. Range provided by EPA.

6 Assume that a masonry berm and doorway spill barrier fill this role. Trucks are constantly in and out of the area, so no permanent containment is possible. (Source: SCS Engineers; see Appendix I.)

7 Assume Category I facilities have 220 feet of intra-facility gathering lines, and Category II facilities have 670 feet of gathering lines. (Source: SCS Engineers; see Appendix I.)

8 Smaller spill kits contain incidental discharges up to 6 gallons (to maintain on a vehicle). Several larger spill kits are designed to control and clean up a discharge up to 30 gallons (include sorbent towels, booms, disposal bags, and personal protective equipment such as splash-resistant gloves).

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Exhibit K-2
Cost of Compliance with SPCC Requirements for Hypothetical Marginal Production Facility (2007$)[1] (7% discount rate)

Baseline Cost of SPCC Promulgation	Category I	Category II

[9] Assume that facilities in Categories I and II both have 50 feet of piping (other than flowlines, intra-facility gathering lines, and piping within tank battery). (Source: SCS Engineers; see Appendix I.)

[10] Assumes one unit of equipment with less than 1,320 gallons of storage. (Source: Review of actual SPCC Plans for production facilities obtained from EPA Regional offices.)

[11] Assume that annual training at Category I facilities will require 1 hour of managerial time; 10 hours of technical time; and 1 hour of clerical time. Category II facilities will require double this labor burden. (Source: SCS Engineers; see Appendix I.)

[12] Assume that annual training at Category I facilities will require 1 hour of managerial time; 6 hours of technical time; and 1 hour of clerical time. Category II facilities will require double this labor burden. (Source: SCS Engineers; see Appendix I.)

[13] Oil handling personnel attend annual briefings to ensure adequate understanding and effective implementation of the SPCC Plan. Requires 2 hours of technical time per year. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007; Scott Baker, Supervisor at Environmental Engineering Department at Sunoco petroleum refinery, Philadelphia, PA, February 2007; Kirk Saunders, Vice President at White Mountain Oil and Propane, North Conway, NH, December 2006; Mike Brower/Mike Chow, Facility Operations Manager/Environmental Services Support at Rhodia Chemical Manufacturing, Freeport, TX, January 2007.)

[14] Assume that secondary containment around all bulk storage containers is practicable, so no cost incurred. (Source: site visits to facilities.)

[15] Weekly inspections by the pumper and/or tank truck driver. Includes observing flange joints, valve glands and bodies, drip pans, and pipe supports. Monthly inspections of conditions of the pumping rod stuffing boxes, wellhead, and gauge valves. Assumes 2 hours per month of technical labor for Category I and 4 hours per month of technical labor for Category II. (Source: SCS Engineers; see Appendix I.)

[16] Visually inspect for oil that may have come from a discharge and remove accumulated oil. Assume 1/4 hour of technical labor per month for Category I and 1/2 hour of technical labor per month for Category II. (Source: SCS Engineers; see Appendix I.)

[17] Assumes periodical visual inspection of containment for oil including the foundation and support area on or above the surface or the ground. Assume 1/4 hour of technical labor per month for Category I and 1/2 hour of technical labor per month for Category II. (Source: SCS Engineers; see Appendix I.)

[18] Assumes monthly inspections by field operation personnel. Includes the pumps and motors for working condition and leaks, hoses, valves, flowlines, and the saltwater injection wellhead. Note: Frequencies of inspections (daily and monthly) may vary depending on production rate. Assume 1/4 hour of technical labor per month for Category I and 1/2 hour of technical labor per month for Category II. (Source: SCS Engineers; see Appendix I.)

[19] Assume 1/4 hour of technical labor per month for Category I and 1/2 hour of technical labor per month for Category II. (Source: SCS Engineers; see Appendix I.)

[20] Assume that Category I facilities have 2,000 feet of flowlines and Category II facilities have 6,000 feet of flowlines. Under the current regulations, assume that due to expense of secondary containment, facilities will choose to make impracticability determination. Length estimates provided by SCS Engineers. A written commitment of manpower, equipment, and materials is required to expeditiously control and remove any quantity of oil discharged that may be harmful. An Oil Spill Contingency Plan is also required with a PE certified impracticability determination along with an explanation of "why you must have impracticability." (Source: SCS Engineers; see Appendix I.)

[21] Cost includes annual inspections, requiring 1 hour of technical labor per 200 feet of flowlines each year; 4 hours of recordkeeping labor; and a one-time cost of $3,180 to develop the program. (Source: SCS Engineers; see Appendix I.)

[22] Assume that discharge reporting requires 1 hour of managerial and 1 hour of technical labor each year, plus $14 in mailing costs for Category I and II, and $16 in mailing costs for Category III. (Source: SPCC ICR 2002; U.S. Postal Service rates for 2007.)

[23] One-time cost of $300 for purchasing a file cabinet/setting up the office. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.)

[24] Total costs may not exactly match a sum of individual cost components due to rounding.

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Section III: Oil Discharge Threat

Based on historical data on discharges, the majority of oil discharges from this facility are likely to be from crude oil, and the typical discharge is likely to be 1,290 gallons.

Section IV: Facility Characteristics Assumptions for Production Facility Cost Estimates

Exhibit K-3 shows the assumptions made regarding facility characteristics.

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Exhibit K-3
Assumptions on Production Facility Characteristics

Cost Item		Category I	Category II
Labor Burden of Certifying an Existing SPCC Plan	PE	6 hours	12 hours
	Clerical Worker	0.5 hour	1 hour
Number of Tank Batteries[2]		1	1
Number of Tanks per Tank Battery[3]	Minimum Capacity	(1) 1,000-gallon tank	(1) 1,000-gallon tank and (1) 10,000-gallon tank
	Maximum Capacity	(1) 10,000-gallon tank	(1) 1,000-gallon tank and (3) 10,000-gallon tanks
Total Tank Capacity		**1,000 – 10,000 gallons**	**11,000 – 31,000 gallons**

[1] Assumes that facility uses in-house labor when a professional engineer is not required. A production facility will incur labor costs roughly proportional to the size of the facility. The labor hours needed to complete a task at a Category II, III, and IV size facility are assumed to be 2, 4, and 6 times the labor hours needed at a Category I size facility, respectively. Assumptions provided by SCS Engineers.

[2] Estimates provided by SCS Engineers; assumption used to develop universe estimates.

[3] Estimates provided by SCS Engineers. EPA assumed that the cost for a 5,000 gallon tank is the average of the cost for a 1,000 gallon tank and a 10,000 gallon tank.

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Hypothetical Facility Profile: Onshore Oil Production Facility – Non-Marginal (NAICS 211111)

Because the term "marginal" typically applies to wells and not production facilities, the first step in describing the characteristics of an onshore oil production facility with non-marginal production involves establishing a methodology for identifying marginal production as it relates to an oil production facility.

Methodology

A well is characterized as "marginal" if the rate of production is such that the well is at the limit of being profitable. The production rate for which this happens depends on operating costs, product prices, tax rates, debt service, environmental compliance costs, and liabilities. The Independent Petroleum Association of America estimates that the profitability point is about $18 per barrel (2004).[43] The average wellhead price in 2004 was $36.77 per barrel.[44]

This current hypothetical profile for a non-marginal production facility assumes that non-marginal facility characteristics are the same as facility characteristics in states with a higher percentage of non-marginal wells than the national average. As shown in Exhibit K-4, the national average for non-marginal wells is 23.3 percent. For this hypothetical profile, only states with a higher percentage of non-marginal wells than the national average are evaluated. Characteristics of onshore production facilities in these states are assumed equivalent to characteristics of non-marginal onshore oil production facilities.

Exhibit K-4 summarizes the states with a higher percentage of non-marginal wells than the national average as taken from the 2004 PetroSystem Report.[45] Because these states are determined by a threshold of the national average for marginal wells, almost half of the states – California, Colorado, Montana, New Mexico, and Wyoming – included in this profile actually have a higher proportion of marginal wells than non-marginal wells. It is assumed, however, that any facility that includes at least one non-marginal well (>10 barrels oil per day) would not be considered a marginal production facility. In the states listed in Exhibit K-4, facilities typically have more wells per tank battery, and therefore a higher likelihood of including at least one non-marginal well. As demonstrated in the sample SPCC Plan from Colorado, the two wells at one production facility had productivity rates of 3.9 and 13.6 barrels of oil per day. In some of the states listed in Exhibit K-4 (Alaska and Florida), more than 90 percent of wells are non-marginal. At least in Alaska, all aspects of production are correspondingly non-marginal; all facilities in

[43] Stateline.org. "Oil sticker shock a windfall to energy-rich states." June 3, 2004 http://www.stateline.org/live/ViewPage.action?siteNodeId=136&languageId=1&contentId=15667.

[44] Independent Petroleum Association of America, IPAA Oil & Natural Gas Producing Industry In Your State. August 2007. http://www.ipaa.org/reports/econreports/IPAAOPI.pdf.

[45] Data provided by Energy Information Administration (EIA) from the U.S. PetroSystem 2004 Study "Distribution of Oil and Gas Wells and Production Project." http://www.eia.doe.gov/pub/oil_gas/petrosystem/petrosysog.html.

Alaska must comply with the Facility Response Plans, as they exceed the thresholds for applicability under §112.20.[46]

Exhibit K-4
Number and Percentage of Non-Marginal Wells for States with a Percentage Higher than the National Average[1]

State	Number of Non-Marginal Wells	Percentage of Total Wells that Are Non-Marginal
Alabama	253	51.6%
Alaska	1,370	97.6%
California	20,800	45.6%
Colorado	1,340	31.3%
Florida	60	96.7%
Mississippi	1,050	65.0%
Montana	1,370	36.4%
Nevada	36	52.9%
New Mexico	4,500	30.1%
North Dakota	1,840	58.7%
South Dakota	58	77.3%
Utah	1,280	58.6%
Wyoming	3,090	29.5%
Total	**37,000**	**--**
United States	**78,600**	**23.3%**

[1] The 2004 PetroSystem Report as found on the EIA Web site lists wells for federal offshore reserves in the Gulf of Mexico and the Pacific. These wells were excluded from the calculations in this hypothetical profile. The report provides data on the national average for well production. Facility-based data, such as storage capacity and number of wells, are taken from personal communications with Martha Wolf and Jane Nakad, EPA Region 8 and Matthew Carr, EPA Region 10, November 7, 2006, as well as sample SPCC Plans from California and Colorado.

Source: 2004 PetroSystem Report.

Production facilities account for 29 percent of the total "Estimated Universe of SPCC-Regulated Facilities." This hypothetical facility contains 46,200 gallons in storage capacity and as such is categorized as a Category III facility, whereas most offshore production facilities are characteristic of Category II facilities.[47]

[46] Personal communication with Matthew Carr, EPA Region 10, November 7, 2006. No specific information was found for Florida oil production facilities.

[47] "Regulatory Impact Analysis for the Final Revisions to the Oil Pollution Prevention Regulations (40 CFR PART 112)." U.S. Environmental Protection Agency; Office of Solid Waste and Emergency Response; Office of Emergency Management. October 2006.

Section I: Basic Facility Characteristics

Oil Types at the Facility:

Well Fluids (crude oil, water, sand, and other formation components), Crude Oil, Produced Water (oil/water mixture).

Production/Storage Areas:

- Typical facility has 5 oil wells (Low and high range: 1-40 wells) [48]
- Flowlines
- Tank battery (oil storage tanks, produced water tank, gun barrel, piping)
- Saltwater disposal well

Production/Storage Rates (per well per day):

Crude oil: 35.6 bbl (1,495 gallons); low-high range: 11.8-1,600 bbl (496-67,000 gallons)[49]

Produced water: 356 bbl (14,950 gallons); range: 118-16,000 bbl (4,960-670,000 gallons)[50]

Produced Water Contents:

Oil/produced water mixture

Storage Capacity:

Total Storage: 46,200 gallons; range: 21,000–168,000,000 gallons

Individual Storage*:*

Stock tanks: 500 bbl each (21,000 gallons) (range: 280-7500 bbl)

a. Number on site*:* The number and size of stock tanks depends on the number of wells and production rate per well. On average, facilities have stock tank storage capacity for 30 days of production.

b. Separators: 20 bbl (840 gallons) (range: 16-60 bbl*).* Separators are more directly correlated to the number of wells. Number on site*:* 1 separator for 2 wells (range: 1-4 wells).

[48] The assumption used is five wells per facility based on personal communication with EPA Regions 8 and 9. One-well production facilities were identified only in California for these regions. BP production in Alaska Prudhoe Bay has 11 separation facilities and 2 gas facilities for an estimated 2,000 wells, although the figure for wells includes reinjection. Source for the average production rate: Energy Information Administration (EIA), Distribution of Wells by Production Rate Bracket, 2004.

[49] This excepts Alaska, which has 105 wells with a production rate greater than 1,600 barrels of oil per day. All other states did not have a well producing more than 1,600 barrels of oil per day.

[50] The water-oil ratio used of 10:1 is a rough estimate of produced water volumes. Source: Sandia National Laboratories at http://www.sandia.gov/water/FactSheets/WIFS_ProducedWaterNew.pdf. Accessed June 24, 2008.

Produced water tank: 500 bbl (21,000 gallons) (range: 280-7500 bbl)

Flowline size/length:

1.5-3 inches in diameter.[51] 15,000 feet per facility (range: 1,000-500,000 feet).

Potential Sources of Oil Discharges:

- Tank battery (crude oil storage tanks, produced water tank, gun barrel/other types of oil/water separator)
- Flowlines (between the wellhead and tank battery) and piping (on storage tanks, gun barrel, and wells)
- Oil wells
- Saltwater disposal (piping/hoses, pumps, valves)
- Transfer and loading operations.

Section II: Cost Analysis of SPCC Requirements

This section presents the cost to this hypothetical facility of complying with the SPCC rule requirements. Exhibit K-5 presents the costs of compliance for each SPCC rule requirement applicable to marginal production facilities. In the table, a row is colored gray if the cost incurred is expected to change due to the proposed amendments. The total annualized cost of compliance includes the annualized value of all one-time initial investments that the facility has to make (fixed costs), such as secondary containment around bulk storage containers and the recurring annual cost related to inspections and training. EPA assumed different estimates for lifetime periods for various compliance activities: 20 years for all fixed structures (except earthen berms) and initial SPCC Plan, 10 years for earthen berms, and 5 years for PE certification (based on the rule requirement). To annualize the fixed costs, EPA used the Accelerated Recovery System (U.S. Code, 2007) for determining the depreciation period for various compliance structures. Therefore, for the depreciation period, the Agency used the following estimates: 10 years for all fixed structures (except earthen berms) and initial SPCC Plan, 6 years for earthen berms and 5 years for PE certification.

Facility storage capacity has an impact on the cost of complying with SPCC rule requirements. The capacity tiers are defined as follows: Category I (1,320-10,000 gallons); Category II (10,001 to 42,000 gallons); Category III (42,001 to 1,000,000 gallons); and Category IV (more than 1,000,000 gallons).[52] The cost estimates are based on specific assumptions for facility characteristics and are not expected to be representative of the cost of a typical production facility. Further, the estimates capture the variability in the cost (1) across the facilities of

[51] This excepts Alaska, where flowlines can be 12-24 inches in diameter.

[52] Please refer to Section IV for assumptions regarding Category I and Category II production facility characteristics.

different sizes within the same broad size category (e.g., a different number of storage containers and/or containers of different sizes) and (2) across different methods or materials used to comply with SPCC requirements (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank). However, these estimates do not take into account the geographical variability of regulated facilities. Therefore, these estimates only provide an illustrative example for facilities in each size category.

Furthermore, the cost savings from the final amendment are based on the assumption that for the flowline amendments, production facilities will choose the lower cost option and will demonstrate that their program is environmentally equivalent to the prescriptive requirements of the final amendment, rather than adopt the prescriptive requirements. The Agency expects that the cost of explaining why secondary containment is impracticable is likely to be similar to the cost of demonstrating in the Plan how the maintenance program is environmentally equivalent to the more prescriptive requirements of the final amendment.[53]

Exhibit K-5
Cost of Compliance with SPCC Requirements for Hypothetical Non-Marginal Production Facility[1]
(2007$) (7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category III In-House/Professional	Category IV In-House/Professional
SPCC Plan		
Prepare SPCC Plan[2]	$1,230	$1,850
Certification of SPCC Plan	$729	$1,090
Amendment of SPCC Plan	$804	$1,210
Re-certification due to amendments	$982	$1,470
Facility Drainage §112.9(b)		
Production/separation area[3]	$66	$99
Secondary Containment§112.7(c), §112.9(c)		
Bulk storage containers, produced water containers, separators/heater-treaters (Earthen berms)[4]	$3,290	$20,100
Bulk storage containers, produced water containers, separators/heater-treaters (Concrete berms)[4]	$9,780	$61,800
Piping (within tank battery)[5]	$5,810	$5,810
Transfer areas (other than loading/unloading racks)[6]	$953	$953
Intra-facility gathering lines[7]	$356	$2,140
Spill kits[8]	$78	$78
Oil-filled equipment[9]	$214	$214

[53] Please refer to Section IV for assumptions regarding Category III and Category IV production facility characteristics.

Exhibit K-5
Cost of Compliance with SPCC Requirements for Hypothetical Non-Marginal Production Facility[1]
(2007$) (7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category III In-House/Professional	Category IV In-House/Professional
Training §112.7(f)		
Prepare for and hold training. Describe trainings provided for facility personnel.[10]	$2,160	$2,160
Prepare for and hold discharge prevention briefings.[11]	$1,390	$1,390
Train a designated person responsible for discharge prevention.[12]	$107	$107
Testing/Inspections §112.9(b)(c)(d)		
Integrity testing for bulk containers, if secondary containment impracticable[13]	N/A	N/A
Aboveground valves and piping[14]	$5,150	$7,720
Oil traps, sumps and skimmers[15]	$643	$965
Containment areas[16]	$643	$965
Saltwater disposal facilities[17]	$643	$965
Inspect diked areas[18]	$643	$965
Impracticability Determination §112.7(d)		
Flowlines[19]	$574	$861
Other types of piping[20]	$574	$861
Other Measures 112.9 (d) (3)		
Develop and implement a flowline maintenance program[21]	$712	$1,400
Discharge reporting[22]	$131	$136
Recordkeeping[23]	$300	$300
Total		
Total cost of complying with SPCC requirements (Earthen berms)[24]	**$28,200**	**$53,800**
Total cost of complying with SPCC requirements (Concrete berms)[24]	**$34,700**	**$95,600**
Average Total Cost of complying with SPCC requirements	**$31,400**	**$74,700**

1 The total cost of compliance is not the same as that used in Chapter 6 of Volume I of the RIA because this profile presents all possible costs that a facility can incur. The cost of compliance presented in Chapter 6 accounted for the percentage of facilities that face certain costs: amending the plan, discharge reporting.

2 Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; prepare a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency. Assume that a new facility already has an accurate facility diagram for its own

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Exhibit K-5
Cost of Compliance with SPCC Requirements for Hypothetical Non-Marginal Production Facility[1]
(2007$) (7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category III In-House/Professional	Category IV In-House/Professional

purposes. The amendment that will allow a new production facility to delay preparation and implementation of an SPCC Plan is not expected to change the cost of compliance. (Cost estimates: SCS Engineers; see Appendix I.)

[3] Drainage outside containment berms is designed to flow into drainage ditches. Drains are closed and sealed at all times except when draining rainwater. Cost includes 8 hours of contractor labor: 4 hours at $75 per hour and 4 hours at $45 per hour, for a Category III facility; and 12 hours of contractor labor: 6 hours at $75 per hour and 6 hours at $45 per hour, for a Category IV facility. (Based on estimate from SCS Engineers; see Appendix I.)

[4] All facilities except those in Alaska will have separation installations (e.g., a heater-treater) within the tank battery. Thus, assume that a typical facility incurs no extra cost for secondary containment for separation installation, and the amendments will not result in any reduction in compliance cost. (Source: Considerations for the Regulation of Onshore Oil Exploration and Production Facilities Under the Spill Prevention, Control, and Countermeasure Regulation (40 CFR Part 112).)

[5] Assume it is located within the berm. 1.5-3 inches in diameter. 10-150 feet in length. Only subject to integrity testing after an impracticability determination if associated with a storage tank without secondary containment. Range provided by EPA.

[6] Assume that a masonry berm and doorway spill barrier fill this role. Trucks are constantly in and out of the area, so no permanent containment is possible. (Source for cost estimates: SCS Engineers; see Appendix I.)

[7] Assume Category III facilities have 670 feet of intrafacility gathering lines, and Category IV facilities have 4 to 8 gathering areas, each with 670 feet of gathering lines. (Source: SCS Engineers; see Appendix I.)

[8] Smaller spill kits contain incidental discharges up to 6 gallons (to maintain on a vehicle). Several larger spill kits are designed to control and clean up a discharge up to 30 gallons (include sorbent towels, booms, disposal bags, and personal protective equipment such as splash-resistant gloves).

[9] Assumes one unit of equipment with less than 1,320 gallons storage. (Source: Review of actual SPCC Plans for production facilities obtained from EPA Regional offices.)

[10] Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 20 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers; see Appendix I.)

[11] Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 12 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers; see Appendix I.)

[12] Oil handling personnel attend annual briefings to ensure adequate understanding and effective implementation of the SPCC Plan. Requires 2 hours of technical time per year. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007; Scott Baker, Supervisor at Environmental Engineering Department at Sunoco petroleum refinery, Philadelphia, PA, February 2007; Kirk Saunders, Vice President at White Mountain Oil and Propane, North Conway, NH, December 2006; Mike Brower/Mike Chow, Facility Operations Manager/Environmental Services Support at Rhodia Chemical Manufacturing, Freeport, TX, January 2007.)

[13] Assume that secondary containment around all bulk storage containers is practicable, so no cost incurred. (Source: site visits to facilities.)

[14] Weekly inspections by the pumper and/or tank truck driver. Includes observing flange joints, valve glands and bodies, drip pans, and pipe supports. Monthly inspections of conditions of the pumping rod stuffing boxes, wellhead, and gauge valves. Assumes 8 hours per month of technical labor for Category III and 12 hours per month of technical labor for Category IV. (Source: SCS Engineers; see Appendix I.)

[15] Visually inspect for oil that may have come from a discharge and remove accumulated oil. Assume 1 hour of technical labor per month for Category III and 1.5 hours of technical labor per month for Category IV. (Source: SCS Engineers; see Appendix I.)

[16] Assumes periodical visual inspection of containment for oil including the foundation and support area on or above the surface or the ground. Assume 1 hour of technical labor per month for Category III and 1.5 hours of technical labor per month for Category IV. (Source: SCS Engineers; see Appendix I.)

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Exhibit K-5
Cost of Compliance with SPCC Requirements for Hypothetical Non-Marginal Production Facility[1]
(2007$) (7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category III In-House/Professional	Category IV In-House/Professional

[17] Assumes monthly inspections by field operation personnel. Includes the pumps and motors for working condition and leaks, hoses, valves, flowlines, and the saltwater injection wellhead. Note: Frequencies of inspections (daily and monthly) may vary depending on production rate. Assume 1 hour of technical labor per month for Category III and 1.5 hours of technical labor per month for Category IV. (Source: SCS Engineers; see Appendix I.)

[18] Assume 1 hour of technical labor per month for Category III and 1.5 hours of technical labor per month for Category IV. (Source: SCS Engineers; see Appendix I.)

[19] Assume that Category III facilities have 6,000 feet of flowlines and Category IV facilities have 24,000 feet of flowlines. Under the current regulations, assume that due to expense of secondary containment, facilities will choose to make impracticability determination. Length estimates provided by SCS Engineers. A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful. An Oil Spill Contingency Plan is also required with a PE certified impracticability determination along with an explanation of "why you must have impracticability." (Source: SCS Engineers; see Appendix I.)

[20] Assume that Category III and IV facilities have 500 feet of piping per containment area (other than flowlines, intra-facility gathering lines, and piping within tank battery). This equals 1,000 feet for Category III and 1,500 feet for Category IV. (Source: SCS Engineers; see Appendix I.)

[21] Cost includes annual inspections, requiring 1 hour of technical labor per 200 feet of flowlines each year; 4 hours of recordkeeping labor; and a one-time cost of $3,180 to develop the program. (Source: SCS Engineers; see Appendix I.)

[22] Assume that discharge reporting requires 1 hour managerial and 1 hour technical labor each year, plus $14 in mailing costs for Category I and II, and $16 in mailing costs for Category III. (Source: SPCC ICR 2002; post office rates for 2007.)

[23] One-time cost of $300 for purchasing a file cabinet/setting up the office. Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.

[24] Total costs may not exactly match a sum of individual cost components due to rounding.

Section III: Oil Discharge Threat

Based on historical discharges, the majority of oil discharges from this facility are likely to be from crude oil, and the typical discharge is likely to be 1,290 gallons.

Section IV: Facility Characteristics Assumptions for Production Facility Cost Estimates

Exhibit K-6 shows the assumptions that were made regarding production facility characteristics.

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Exhibit K-6
Assumptions on Production Facility Characteristics

Cost Item		Category III	Category IV	
Labor Burden of Certifying an Existing SPCC Plan	PE	24 hours	36 hours	
	Clerical Worker	2 hours	4 hours	
Number of Tank Batteries[2]		1	4	8
Number of Tanks per Tank Battery[3]	Minimum Capacity	(3) 20,000-gallon tanks	(3) 100,000-gallon tanks	(3) 50,000-gallon tanks
	Maximum Capacity	(3) 100,000-gallon tanks		
Total Tank Capacity		**60,000 – 300,000 gallons**	**1,200,000 gallons**	

[1] Assumes that facility uses in-house labor when a professional engineer is not required. A production facility will incur labor costs roughly proportional to the size of the facility. The labor hours needed to complete a task at a Category II, III, and IV size facility are assumed to be 2, 4, and 6 times the labor hours needed at a Category I size facility, respectively. Assumptions provided by SCS Engineers.

[2] Estimates provided by SCS Engineers; assumption used to develop universe estimates.

[3] Estimates provided by SCS Engineers.

Hypothetical Facility Profile: Farms (NAICS 111 and 112)

Oil storage characteristics on farms are difficult to generalize because oil storage capacities and configurations vary from farm to farm (i.e., a general layout suitable for all farms does not exist as it might for other regulated industries). In addition, farm facilities differ from other types of facilities regulated by the SPCC rule. For example, farms exhibit the following characteristics:

- Private ownership with private residences and people on site around the clock
- Dispersed, low volume storage, often separated on different farm parcels and by roads and natural barriers
- Multiple fueling sites
- Locations in areas less visible to the public
- Oil storage on site for on-farm use and not distribution
- Seasonal use of oil
- A significant amount of land rented to second parties, raising the issue of who pays for SPCC-related requirements.

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Because farm facilities are difficult to generalize, EPA identified five illustrative farms to illustrate potential oil storage configurations and associated SPCC compliance costs at farms. These five illustrative farms are:

- New York Dairy Farm
- Midwestern Grain Farm
- Eastern North Carolina Cotton/Gin Farm
- Western Vegetable Specialty Farm (Vineyard or Vegetables)
- Arkansas Rice Farm

These profiles were developed using data obtained by EPA during the Agency's site visits to a non-random selection of New York dairy farms, cotton/gin operations in eastern North Carolina, and rice farms in Arkansas.[54] EPA selected one farm from each of these farm types for each oil storage capacity category, with the exception of Category IV because EPA did not visit any farms that store more than one million gallons of oil. EPA was also not able to choose a farm illustrative of a Midwestern grain farm or a Western vegetable specialty farm because it does not have data on these farm types yet.[55] Exhibit K-7 presents details on the farms selected as "model" facilities for the purposes of the SPCC RIA cost estimation.

Exhibit K-7
Model Farms Used in the SPCC RIA

Oil Storage Capacity Category	Model Farm Facility	Tank Size (gallons)	Fuel Type	Central or Satellite?	Total Bulk Oil Storage Capacity (gallons)	% of Total Oil Storage in Central Location
I	Conner Cotton Gin Co.	1,000	diesel	Assumed central	3,860 (9 tanks)	52%
		1,000	gasoline	Assumed central		
		500	diesel	Emergency - for residence		
		500	diesel	Emergency - for livestock		
		200	N/P	Nurse tank on truck		
		200	N/P	Nurse tank on truck		
		200	N/P	Nurse tank on truck		
		200	N/P	Nurse tank on truck		
		55	hydraulic oil	Drum		
II	Hemdale Farm (NY DAIRY)	15,000	diesel	Assumed central	30,700 (15 tanks)	98%
		10,000	diesel	Assumed central		

[54] Specifically, EPA gathered data for 4 rice farms in Arkansas, 13 dairy farms in New York, and 6 cotton/gin operations in Eastern North Carolina.

[55] EPA is currently working with EPA regions, USDA, and farm industry representatives to gather data on these farm types.

Exhibit K-7
Model Farms Used in the SPCC RIA

Oil Storage Capacity Category	Model Farm Facility	Tank Size (gallons)	Fuel Type	Central or Satellite?	Total Bulk Oil Storage Capacity (gallons)	% of Total Oil Storage in Central Location
		5,000	gasoline	Assumed central		
		660	hydraulic oil	12 Drums		
III	Seidenstricker's Farm (AR RICE)	12,000	diesel	Central	42,100 (24 tanks)	51%
		8,000	diesel	Central		
		1,000	diesel	Central		
		275	hydraulic oil	Central		
		275	hydraulic oil	Central		
		2,500	diesel	Refueler truck		
		8,000	diesel	Wellhead pump tanks (8)		
		9,000	diesel	Relift pump tanks (9)		
		1,000	diesel	Portable fuel		

To estimate the costs of compliance with the 2002 SPCC rule, the Agency used parameters of the illustrative farms for each oil storage capacity category and assumptions regarding the manner in which farms may choose to comply with SPCC requirements. For example, EPA assumes that farms may choose to comply with secondary containment requirements using either earthen or concrete berms, and multiplied the unit cost of constructing each type of containment structure by the size and number of tanks at each model farm to estimate the potential costs to a farm in each oil storage capacity category. The assumptions employed for the primary SPCC requirements with which farms must comply are summarized in Exhibit K-8. SPCC requirements not listed in Exhibit K-8 are requirements with which farms probably do not have to comply because they lack structural components or other characteristics that would necessitate compliance, such as loading racks.

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Exhibit K-8
Assumptions on Farm Characteristics

Cost Item	Category I		Category II		Category III	
Labor Burden[1]	Labor burden of certifying an existing SPCC Plan					
	PE	4 hours	PE	8 hours	PE	12 hours
	Clerical worker	2 hours	Clerical worker	4 hour	Clerical worker	6 hours
Number of Tanks[2]	Per Farm	(2) 1,000 gallon tank	Per farm	(1) 15,000 gallon (1) 1,000 gallon	Per farm	(1) 12,000 gallon (17) 1,000 gallon
Total Tank Capacity[2]	3,860 gallons		30,700 gallons		42,100 gallons	
Oil filled operational equipment[2]	(1) 840 gallons		None		None	
Fence for security only oil storage and transfer[2]	25’ by 25’ by 6’		25’ by 25’ by 6’		25’ by 25’ by 6’	
Provide adequate security for valves[2]	(2) Locking valves		(2) Locking valves		(18) Locking valves	
Securely cap piping[2]	(2) Piping caps		(2) Piping caps		(18) Piping caps	
Provide facility lighting[2]	(1) Lit tank		(1) Lit tank		(1) Lit tank	
Perform integrity testing of aboveground bulk storage containers with secondary containment[2]	One external inspection every 10 years		One external inspection every 10 years		One external inspection every 10 years	
Inspect pumps, ejectors, dikes, and containers for oil discharge[2]	12 inspections per year		12 inspections per year		12 inspections per year	
Install liquid level sensing devices[2]	One unit per farm		One unit per farm		One unit per farm	
Secondary containment for transfer areas[2]	One loading area		One loading area		One loading area	
Secondary containment for mobile/portable oil storage containers[2]	(4) 200 gallon nurse tanks		(0) – Mobile oil tanks		(1) 2,500 gallon truck (2) 1,000 gallon portable fuel tank	

[1] Assume that facility uses in-house labor when a professional engineer is not required. A farm will incur labor costs roughly to the size of the farm. The labor hours needed to complete a task at a Category II, III, IV size facility are assumed to be 2,3,and 5 times the labor hours needed at a Category I size facility, respectively. Assumptions provided by SCS Engineers

[2] Estimates represent details for each farm listed in Exhibit K-7.

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Finally, EPA employs the following assumptions in calculating the aggregate cost of the SPCC rule to farms:

- Assume that only 10 percent of farms have partially buried storage tanks and have to comply with anti-corrosive measures for these tanks. For the farms that have to comply, EPA assumes that farms in Categories I and II have one 1,000-gallon partially buried storage tank and farms in Categories III and IV have one 5,000-gallon partially buried storage tank.
- Assume that 50 percent of farms comply with secondary containment requirements for bulk storage tanks using earthen berms; 25 percent comply using concrete berms; and 25 percent comply using creative no-cost methods such as placing one storage tank inside another tank that has been cut in half.

SPCC Compliance Costs

This section presents the costs of compliance with SPCC rule requirements for each hypothetical farm facility. Exhibit K-9 presents the costs of compliance for each SPCC rule requirement applicable to farms. In the table, a row is colored gray if the cost incurred is expected to change due to the proposed amendments. The total annualized cost of compliance includes the annualized value of all one-time initial investments that the facility has to make (fixed costs), such as secondary containment around bulk storage containers and the recurring annual cost related to inspections and training. EPA assumed different estimates for lifetime periods for various compliance activities: 15 years for all fixed structures (except earthen berms) and initial SPCC Plan, 10 years for earthen berms, 12 years for integrity testing, 20 years for brittle fracture evaluation for field-constructed containers, and 5 years for PE certification (based on the rule requirement). To annualize the fixed costs, EPA used the Accelerated Recovery System (U.S. Code, 2007) for determining the depreciation period for various compliance structures. Therefore, for the depreciation period, the Agency used the following estimates: 10 years for all fixed structures (except earthen berms) and initial SPCC Plan, 6 years for earthen berms, 7 years for integrity testing, 15 years for brittle fracture evaluation, and 5 years for PE certification.

The capacity tiers are defined as follows: Category I (1,320-10,000 gallons); Category II (10,001 to 42,000 gallons); Category III (42,001 to 1,000,000 gallons); and Category IV (more than 1,000,000 gallons). The cost estimates are based on specific assumptions for facility characteristics and are not expected to be representative of the cost of a typical farm. Further, the estimates capture the variability in the cost (1) across the facilities of different sizes within the same broad size category (e.g., a different number of storage containers and/or containers of different sizes) and (2) across different methods or materials used to comply with SPCC requirements (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank). However, these estimates do not take into account the geographical variability of regulated farms. Therefore, these estimates only provide an illustrative example for facilities in each size category.

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Exhibit K-9
Cost of Compliance with SPCC Requirements for Farms (2007$) 7% Discount Rate

Baseline Requirement - Before Promulgation of 2008 SPCC Rule Amendments	Cost Estimate		
	Category I	Category II	Category III
PLAN PREPARATION AND MAINTENANCE			
Prepare an SPCC Plan (§112.3).[1]	$552	$1,110	$1,610
Plan Certification			
Certify the SPCC Plan.	$365	$729	$1,090
SPCC PLAN IMPLEMENTATION ACTIVITIES			
Anti-Corrosive Measures			
Provide coatings or cathodic protection to protect partially buried tanks from corrosion.[2]	$91	$91	$292
Provide coatings or cathodic protection to protect buried piping from corrosion.[3]	$0	$86	$226
Design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction.[4]	$98	$98	$98
Drainage Measures			
Restrain drainage from diked storage areas by using valves of manual, open-and close design.[5]	$746	$746	$746
Secondary Containment Measures			
Provide secondary containment for bulk storage containers - Earthen Berms[6]	$555	$1,040	$5,410
Provide secondary containment for bulk storage containers -Concrete Berms[6]	$931	$4,220	$10,700
Provide secondary containment for mobile/portable oil storage containers.[7]	$230	$0	$1,010
Install drain covers and spill kits.[8]	$121	$121	$121
Provide secondary containment at a transfer area (other than a loading/unloading rack).[9]	$953	$953	$953
Provide secondary containment for piping (Category III – impracticability determination)[10]	$150	$150	$529

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Exhibit K-9
Cost of Compliance with SPCC Requirements for Farms (2007$) 7% Discount Rate

Baseline Requirement - Before Promulgation of 2008 SPCC Rule Amendments	Cost Estimate		
	Category I	Category II	Category III
Provide secondary containment for oil-filled operating equipment (OFE).[11]	$214	$0	$0
Security Measures			
Fully fence the facility.[12]	$611	$698	$2,530
Provide adequate security measures for valves.[13]	$58	$58	$525
Comply with security requirements for piping (e.g., securely capped piping connections).[14]	$22	$22	$197
Provide facility lighting to help discover discharges and prevent vandalism.[15]	$319	$319	$319
Other Measures			
Install liquid level sensing devices.[16]	$1,710	$1,710	$1,710
Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations. Describe methods.[17]	$370	$370	$755
Training			
Prepare for and hold training. Describe trainings provided for facility personnel (§112.7(f)(1)).[18]	$1,110	$2,160	$2,160
Prepare for and hold discharge prevention briefings. (§112.7(f)(3))[19]	$717	$1,390	$1,390
Train a designated person responsible for discharge prevention.[20]	$107	$107	$107
Inspections and Testing			
Inspect pumps, ejectors, dikes, and containers for oil discharge. ((§112.8(b)(1) and (§112.12(b)(1)) Assume 12 inspections per year.[12]	$643	$1,290	$1,290
Perform integrity testing of aboveground bulk storage containers with secondary containment. ((§112.8(c)(6) and (§112.12(c)(6))[12]	$557	$557	$5,570
Conduct integrity and leak testing of buried piping.[4]	$0	$126	$253
Test liquid level sensing devices to ensure proper operation.[12]	$643	$1,290	$23,200

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Exhibit K-9
Cost of Compliance with SPCC Requirements for Farms (2007$) 7% Discount Rate

Baseline Requirement - Before Promulgation of 2008 SPCC Rule Amendments	**Cost Estimate**		
	Category I	**Category II**	**Category III**
Inspect piping for deterioration and corrosion.[12]	$322	$322	$3,220
Inspect all aboveground valves, piping and appurtenances.[12]	$322	$322	$3,220
Recordkeeping and Discharge Reporting			
Recordkeeping - One-time[21]	$407	$407	$500
Discharge Reporting[22]	$129	$129	$131
Total			
TOTAL[23] - Earthen berms	**$12,100**	**$16,400**	**$59,100**
TOTAL[23] - Concrete berms	**$12,500**	**$19,600**	**$64,400**
TOTAL[23] - No secondary containment cost for bulk containers	**$11,600**	**$15,300**	**$53,700**
TOTAL – Average	**$12,100**	**$17,100**	**$59,100**

1 Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; prepare a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency. Assume that a new facility already has an accurate facility diagram for its own purposes. The amendment that will allow a new production facility to delay preparation and implementation of an SPCC Plan is not expected to change the cost of compliance. (Source: SCS Engineers; see Appendix I.)

2 Assume that farms in Categories I and II have one 1,000-gallon partially buried storage tank, and farms in Category III have one 5,000 gallon partially buried tank. (Source: SCS Engineers; see Appendix I.)

3 Assume that Category I facilities have no buried piping, Category II facilities have 50-200 feet, and Category III facilities have 200-500 feet. (Source: SCS Engineers; see Appendix I.)

4 Assume farms in Categories I and II have 50 feet of piping, and Category III facilities have 1,000 feet. (Source: SCS Engineers; see Appendix I.)

5 Assume one valve per central storage tank. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007.)

6 Assume that Category I berm is for the central storage (largest container = 1,000 gallons) and satellite storage (1,000 gallons). Category II berm is for central storage (largest container = 15,000 gallons) and satellite storage (1,000 gallons). Category III berm is for central storage (largest container = 12,000 gallons) and 17 containers for satellite storage (1,000 gallon estimate). (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007.)

7 Describe methods. Provide separate estimates for different methods. Assume that a Category I farm has four 200-gallon nurse tanks (total = 800 gallons). A Category II farm has no mobile oil tanks. A Category III farm has one 2,500-gallon refueler truck and one 1,000-gallon portable fuel tank. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007; SPCC Plans obtained from EPA Regions.)

8 Assume that farms have one drainage area, so require 1 drain cover (at $100-$500) and 1 spill kit (at $100-$1,000). (Source: SCS Engineers.)

9 Describe methods. Provide separate estimates for different methods. Assume that Category I, Category II, and Category III farms have one loading area; a masonry berm and concrete spill barrier would fill this role, because trucks are constantly in and out of the area, so no permanent secondary containment is possible. (Source: SCS Engineers; see Appendix I.)

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Exhibit K-9
Cost of Compliance with SPCC Requirements for Farms (2007$) 7% Discount Rate

Baseline Requirement - Before Promulgation of 2008 SPCC Rule Amendments	Cost Estimate		
	Category I	Category II	Category III

[10] Assume that facilities in Categories I and II have 50 feet of aboveground piping, and that Category III facilities have 1,000 feet. (Source: SCS Engineers; see Appendix I.)

[11] Describe methods. Provide separate estimates for different methods. Assume that Category I farms have one unit (840 gallons). Category II and Category III farms have no OFE. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007; SPCC Plans obtained from EPA Regions.)

[12] (Source for cost estimates: SCS Engineers; see Appendix I.)

[13] Assume one locking valve for each central and satellite storage container. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007; SPCC Plans from EPA Regions.)

[14] Assume one installation per tank. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007; SCS Engineers; see Appendix I.)

[15] Assume that one central storage location is lit. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007; SPCC Plans obtained from EPA Regions.)

[16] Assume one liquid level sensing device unit per farm. (Source: Personal communication with Troy Swackhammer at USEPA/OSWER/OEM, 2007.)

[17] Assume one warning sign at a central storage location. (Source: EPA; SCS Engineers; see Appendix I.)

[18] Assume one training session by facility personnel annually. Assume that this requires 1 hour of managerial time, 10 hours of technical time, and 2 hours of clerical time annually. (Source: SCS Engineers; see Appendix I.)

[19] Assume one briefing by facility personnel annually. Assume that this will require 1 hour of managerial time; 6 hours of technical time, and 1 hour of clerical time annually. (Source: SCS Engineers; see Appendix I.)

[20] Assume that this will require 2 hours of technical time annually. (Source: SCS Engineers.)

[21] Assume that existing facilities have the following annual labor costs for continuous recordkeeping: Category I: 2.5 hours; Category II: 3 hours; Category III: 5 hours. New facilities require one-time labor (Categories I and II only) of 2 hours to organize recordkeeping; or one-time expenditure (Category III and IV only) of $200 for the tank database software. Additionally, all new facilities require a one-time $300 expenditure for purchasing a filing cabinet/setting up the office. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007; Scott Baker, Supervisor at Environmental Engineering Department at Sunoco petroleum refinery, Philadelphia, PA, February 2007; Kirk Saunders, Vice President at White Mountain Oil and Propane, North Conway, NH, December 2006; Mike Brower/Mike Chow, Facility Operations Manager/Environmental Services Support at Rhodia Chemical Manufacturing, Freeport, TX, January 2007.)

[22] Assume that discharge reporting requires 1 hour of managerial and 1 hour of technical labor each year, plus $14 in mailing costs for Category I and II, and $16 in mailing costs for Category III. (Source: SPCC ICR 2002; U.S. Postal Service rates for 2007.)

[23] The three different cost estimates are based on a facility having earthen berms for secondary containment for bulk storage containers, a concrete berm for secondary containment for bulk storage containers, and creative measures that imply that farms would not have to incur this cost.

Assume no cost for farms for the following: (A) Monitor the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse. (B) Test liquid level sensing devices to ensure proper operation ((§112.8(c)(8)(v) and (§112.12(c)(8)(v)). (C) Inspect piping for deterioration and corrosion ((§112.8(d)(1) and (§112.12(d)(1)). (D) Inspect all aboveground valves, piping and appurtenances ((§112.7(i)). (E) Perform brittle fracture evaluation of field-constructed containers (if field-constructed containers are present). Assume that farms have mostly shop-built containers; assume no field-constructed containers. (F) Observe effluent treatment facilities to detect discharge (if such facilities are present). (G) Leak test completely buried metallic tanks. (H) Conduct integrity and leak testing of buried piping.

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Hypothetical Facility Profile: Animal Fats and Vegetable Oils Facility (NAICS 311)

Animal Fats and Vegetable Oils (AFVO) facilities are typically food manufacturing facilities, including facilities in the following industries: biodiesel; soybean processing; peanut butter manufacturing; and food processing.

The following facility characteristics were assumed in the development of this hypothetical profile:

Oil types stored at the facility:

An AFVO facility stores vegetable oils (including biodiesel, peanut butter, soybean oil, and oleo chemicals) and petroleum oils (including hexane mineral oil, gas, diesel, and miscellaneous petroleum oils such as lubricating, hydraulic, transformer, transmission, waste oil). Any particular facility will store several, but probably not all, of these types of oil.

Oil storage areas:

Vegetable oil can be stored at many areas within the facility, including large storage tanks (anywhere from 1,000 to 100,000 gallons), 1,000-gallon portable tanks, and 55-gallon drums. Petroleum oil can also be stored in various large tanks (also ranging from 1,000 to 100,000 gallons), and in 55-gallon drums. Oil is also stored in between 50-1,500 feet of aboveground piping and up to 500 feet of underground piping. Facilities also have three 100 gallon transformers, and a 3,000-gallon oil/water separator.

Loading rack:

The facility contains one loading/unloading rack. Some facilities may also have a tanker truck.

SPCC Compliance Costs

This section presents the costs of compliance with SPCC rule requirements for each size of hypothetical AFVO facility. Exhibit K-10 presents the costs of compliance for each SPCC rule requirement applicable to AFVO facilities. In the table, a row is colored gray if the cost incurred is expected to change due to the proposed amendments. The total annualized cost of compliance includes the annualized value of all one-time initial investments that the facility has to make (fixed costs), such as secondary containment around bulk storage containers and the recurring annual cost related to inspections and training. EPA assumed different estimates for lifetime periods for various compliance activities: 15 years for all fixed structures (except earthen berms) and initial SPCC Plan, 10 years for earthen berms, 12 years for integrity testing, 20 years for brittle fracture evaluation for field-constructed containers, and 5 years for PE certification (based on the rule requirement). To annualize the fixed costs, EPA used the Accelerated Recovery System (U.S. Code, 2007) for determining the depreciation period for various compliance structures. Therefore, for the depreciation period, the Agency used the following estimates: 10 years for all fixed structures (except earthen berms) and initial SPCC

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Plan, 6 years for earthen berms, 7 years for integrity testing, 15 years for brittle fracture evaluation, and 5 years for PE certification.

The capacity tiers are defined as follows: Category I (1,320-10,000 gallons); Category II (10,001 to 42,000 gallons); Category III (42,001 to 1,000,000 gallons); and Category IV (more than 1,000,000 gallons). The cost estimates are based on specific assumptions for facility characteristics and are not expected to be representative of the cost of a typical facility. Further, the estimates capture the variability in the cost (1) across the facilities of different sizes within the same broad size category (e.g., a different number of storage containers and/or containers of different sizes) and (2) across different methods or materials used to comply with SPCC requirements (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank). However, these estimates do not take into account the geographical variability of regulated facilities, or the entire range of the variety found in AFVO facility types. Therefore, these estimates only provide an illustrative example for facilities in each size category.

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Exhibit K-10
Cost of Compliance with SPCC Requirements for Hypothetical AFVO Facility using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
SPCC Plan				
Prepare SPCC Plan[2]	$552	$1,100	$1,610	$2,390
Certification of SPCC Plan	$365	$729	$1,090	$1,640
Anti-Corrosive Measures				
Coatings or cathodic protection to protect buried piping[3]	N/A	$180	$856	$856
Pipe supports[4]	$98	$98	$2,050	$3,080
Facility Drainage §112.9(b)				
Drainage systems for loading rack[5]	N/A	$592	$592	$592
Restrain drainage from diked storage areas using valves of manual, open-and-close design[6]	$746	$746	$1,490	$2,240
Secondary Containment§112.7(c), §112.9(c)				
Bulk storage containers – Earthen berms[7]	$485	$1,260	$5,190	$15,800
Bulk storage containers – Concrete berms[7]	$2,810	$7,470	$26,900	$84,900
Mobile/portable oil storage containers[8]	$288	$288	$288	$288
Transfer areas (other than loading/unloading racks)[9]	$954	$954	$954	$954
Drain covers and spill kits[10]	$121	$121	$242	$363
Piping[11]	$150	$150	N/A	N/A
Oil-filled operating equipment[12]	$641	$641	$641	$641
Security				
Fully fence the facility[13]	$611	$698	$2,530	$3,890
Security measures for valves[14]	$58	$58	$194	$290

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Exhibit K-10
Cost of Compliance with SPCC Requirements for Hypothetical AFVO Facility using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
Lighting[15]	$319	$319	$3,190	$4,790
Cap and blank-flange terminal connections at the transfer point and marking it as to origin when the piping is not in use[16]	$22	$22	$97	$131
Training §112.7(f)				
Prepare for and hold training. Describe trainings provided for facility personnel.[17]	$1,110	$2,160	$2,160	$2,160
Prepare for and hold discharge prevention briefings.[18]	$717	$1,380	$1,380	$1,380
Train a designated person responsible for discharge prevention.[19]	$107	$107	$107	$107
Testing/Inspections §112.9(b)(c)(d)				
Inspect lowermost drain and outlets of vehicles at loading racks, and if necessary ensure that they are tightened, adjusted, or replaced[20]	$161	$1,350	$2,740	$5,420
Pumps, ejectors, dikes, and containers[20]	$643	$1,290	$1,290	$1,290
Integrity testing of aboveground bulk storage containers with secondary containment[20]	$278	$1,110	$2,230	$4,450
Steam return and exhaust lines[20]	$322	$322	$322	$322
Integrity and leak test buried piping[3]	N/A	$126	$253	$253
Liquid level sensing devices[20]	$643	$1,930	$7,080	$18,000
Inspect piping for deterioration and corrosion[20]	$322	$322	$3,220	$3,860

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Exhibit K-10
Cost of Compliance with SPCC Requirements for Hypothetical AFVO Facility using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
Aboveground valves, piping and appurtenances[20]	$322	$322	$3,220	$3,860
Brittle fracture evaluation of field-constructed containers[21]	N/A	N/A	$522	$522
Observe effluent treatment facilities to detect discharge[22]	$643	$643	$643	$643
Impracticability Determination §112.7(d)				
Aboveground piping[23]	N/A	N/A	$861	$1,260
Other Measures				
Install liquid level sensing devices[24]	$1,710	$1,710	$3,420	$5,130
Equip the final discharge of ditches with a diversion system[25]	$176	$176	$345	$868
Warn all vehicles entering the facility[26]	$370	$370	$769	$1,150
Provide two pumps[20]	$27	$27	$27	$27
Recordkeeping and Discharge Reporting				
Discharge reporting[27]	$129	$129	$131	$136
Recordkeeping[28]	$407	$407	$500	$500
Total				
Total cost of complying with SPCC requirements – Earthen berms[29]	**$13,500**	**$21,800**	**$52,200**	**$89,300**
Total cost of complying with SPCC requirements – Concrete berms[29]	**$15,800**	**$28,100**	**$74,000**	**$158,400**
Average total cost of complying with SPCC requirements	**$14,700**	**$25,000**	**$63,100**	**$123,900**

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Exhibit K-10
Cost of Compliance with SPCC Requirements for Hypothetical AFVO Facility using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV

[1] The total cost of compliance is not the same as that used in Chapter 6 of Volume I of the RIA because this profile presents all possible costs that a facility can incur. The cost of compliance presented in Chapter 6 accounted for the percentage of facilities that face certain costs: amending the plan, discharge reporting.

[2] Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; prepare a discussion of conformance with applicable more stringent state rules, regulations, and guidelines in the SPCC Plan; and organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency. Assume that a new facility already has an accurate facility diagram for its own purposes. The amendment that will allow a new production facility to delay preparation and implementation of an SPCC Plan is not expected to change the cost of compliance. (Source: SCS Engineers.)

[3] Assume that Category I facilities have no underground piping; Category II facilities have 50-200 feet of underground piping; Category III and IV facilities have 200-500 feet.

[4] Assume that Category I and II have 50 feet of 4-inch aboveground piping with 6 pipe supports, Category III has 1,000 feet of 4-inch aboveground piping with 125 supports, and Category IV has 1,500 feet of 4-inch aboveground piping with 188 supports.

[5] AFVO facilities are assumed to have a loading rack, but for purposes of compliance with 112.7(h)(1), Category I facilities are not. Category I facilities usually use a single hose or standpipe.

[6] For Category I and II: 1 drainage area; for Category III, 2 drainage areas; and Category IV, 3 drainage areas. Cost is given at a range of $480-$680 per drainage area for manual open and closed design, or a range of $800-$10,000 per drainage area for a hydrophobic/oleophilic drain shutoff system (depending on "size and complexity of facility"). (Source: SCS Engineers.)

[7] Assume, for purposes of secondary containment, that Category I has either: (A) 1x 1,000 gallon aboveground storage tank or (B) 1x 10,000 gallon AST. Category II has either (A) 1x 1,000 gallon AST and 1x 10,000 gallon AST; or (B) 1x 1,000 gallon and 3x 10,000 gallon ASTs; the 3x 10,000 gallon tanks are in a common containment area. Category III has either (A) 3x 20,000 gallon ASTs; or (B) 2x 25,000 gallon ASTs and 3x 50,000 gallon ASTs in a common containment area, and 3x 100,000 gallon ASTs in a second common containment area. Category IV has either (A) 4x 25,000 gallon and 2x 50,000 gallon tanks in a common containment area, 4x 50,000 gallon and 1x 100,000 gallon tanks in a common containment area, and 5x100,000 gallon tanks in a common containment area; or (B) 4 containment areas, each with 3x 100,000 gallon ASTs. (Source: SCS Engineers.)

[8] Assume 1,000-gallon containers. (Source: SCS Engineers.)

[9] Assume that a masonry berm and doorway spill barrier fill this role. Trucks are constantly in and out of the area, so no permanent containment is possible. (Source: SCS Engineers.)

[10] Smaller spill kits contain incidental discharges up to 6 gallons (to maintain on a vehicle). Several larger spill kits are designed to control and clean up a discharge up to 30 gallons (include sorbent towels, booms, disposal bags, and personal protective equipment such as splash-resistant gloves).

[11] Assume the following lengths for double-wall, 4-inch piping: Category I and II have 50 feet; Category III has 1,000 feet, and Category IV has 1,500 feet. For Category III and IV, this is 500 feet per containment area. (Source: SCS Engineers.) Assume that Category I and II facilities will implement secondary containment, but that Category III and IV facilities will determine secondary containment for piping to be impracticable. (Source: Site visits to facilities; SCS Engineers.)

[12] Assume that the facility contains 3 units of oil-filled operating equipment. (Source: SPCC Plans obtained from EPA Regions.)

[13] SCS Engineers provided estimates for fencing costs for the following facility sizes: Category I: ½ acre; Category II: 2 acres; Category III: 5 to 10 acres;

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Exhibit K-10
Cost of Compliance with SPCC Requirements for Hypothetical AFVO Facility using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV

Category IV: 10 to 20 acres.

14 Assume 2 locking valves per loading or containment area. (Source: SCS Engineers.)

15 Assume one 10-foot pole with 150-watt light, and 20 feet of trenching for electrical wires, for each loading/unloading area. (Source: SCS Engineers.)

16 Assume $100 per blank-flange and 1 hour of technical labor. Category I and II facilities have 1 flange; Category III has 4 flanges; Category IV has 6 flanges. (Source: SCS Engineers.)

17 Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 20 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers.)

18 Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 12 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers.)

19 Oil handling personnel attend annual briefings to ensure adequate understanding and effective implementation of the SPCC Plan. Requires 2 hours of technical time per year. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007; Scott Baker, Supervisor at Environmental Engineering Department at Sunoco petroleum refinery, Philadelphia, PA, February 2007; Kirk Saunders, Vice President at White Mountain Oil and Propane, North Conway, NH, December 2006; Mike Brower/Mike Chow, Facility Operations Manager/Environmental Services Support at Rhodia Chemical Manufacturing, Freeport, TX, January 2007.)

20 Source for cost estimates: SCS Engineers.

21 Assume that Category I and II facilities are too small to have field-constructed containers; and Category III and IV facilities have 20,000-gallon field-constructed steel ASTs. (Source: SCS Engineers.)

22 Assume that effluent treatment facilities are present. (Based on SPCC Plan for Cargill, Inc., Lafayette, Indiana, September 2006.)

23 Secondary containment for aboveground piping is considered to be impracticable for Category III and IV facilities. Source for cost estimates: SCS Engineers.

24 Source for cost estimates: SCS Engineers. Assume 1 Scully signal per loading/unloading area, and 1 loading/unloading area for Category I and II, 2 loading/unloading areas for Category III, and 3 loading/unloading areas for Category IV.

25 Assume that Category I and II facilities have 100 linear feet of ditches; Category III has 200 linear feet; and Category IV has 500 linear feet. (Source: SCS Engineers.)

26 Assume that vehicle warning consists of one of the following: (1) Warning signs – 1 for Category I and II; 2 for Category III; 3 for Category IV; (2) Bollards – 10 for Category I and II; 20 for Category III; 30 for Category IV; (3) Guard rails – 25' x 25' for Category I and II; Category III: 70' x 100' (area 1) and 70' x 120' (area 2); Category IV: 70' x 100' (area 1), 90' x 100' (area 2), 84' x 120' (area 3). (Source: SCS Engineers.)

27 Assume that discharge reporting requires 1 hour of managerial and 1 hour of technical labor each year, plus $14 in mailing costs for Category I and II, and $16 in mailing costs for Category III. (Source: SPCC ICR 2002; U.S. Postal Service rates for 2007.)

28 One-time cost of $300 for purchasing a file cabinet/setting up the office. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.)

29 Total costs may not exactly match a sum of individual cost components due to rounding.

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Hypothetical Facility Profile: Asphalt Facility (NAICS 324)

The facilities on which this profile is based are responsible for manufacturing asphalt products including asphalt and tar paving mixtures and asphalt-based construction products from purchased asphalt material (e.g., shingles, coated membranes). This profile does not cover the manufacture of the asphalt itself. The hypothetical profile also does not cover facilities that strictly store and distribute asphalt; these facilities are covered under the bulk storage terminal profile. Instead, this hypothetical profile covers manufacturers' asphalt-derived products where asphalt is a key input in the production.

Establishments in this segment of the industry include hot-mix asphalt mixing plants, which typically mix asphalt with sand and aggregates for use in road construction. The asphalt serves as the binder in the mixture. The plants receive asphalt from a petroleum refiner/marketer. The asphalt is stored in stock tanks prior to its use in the batch production of asphalt cement mixtures. In some instances, the plants also receive and/or blend asphalt emulsions and other asphalt-derived products.

<u>Oil types stored at the facility:</u>

An asphalt facility is likely to store liquid asphalt, diesel, #2 fuel oil, #5 fuel oil, gasoline, kerosene, Tol-Oil, and waste oil.

<u>Oil storage and production areas:</u>

Asphalt cement binder is highly viscous. It becomes liquid at approximately 175°F. To ensure working conditions, asphalt facilities generally maintain asphalt cement tanks at temperatures above about 300°F in insulated and heated tanks. These tanks may be heated using fuel oil, natural gas, or electrical elements.

Oil storage containers and areas may include asphalt cement tanks, diesel tanks, heating oil tanks, oil waste tanks (all 1,000 to 100,000 gallons), 1,000-gallon portable containers, 50 to 1,500 feet of aboveground piping, and up to 500 feet of underground piping. Oil may also be stored in mixing equipment (loaders, mixers, pumps) and loading/unloading areas (including tanker trucks, barges and/or railcars). Other facility storage includes drums of hydraulic oil, transmission fluids, lubricants, degreasing agents, and other types of oil used in operating facility equipment.

<u>Loading rack:</u>

No loading/unloading rack is present at the facility.

<u>Oil-filled equipment:</u>

No oil-filled electrical, operating, or manufacturing equipment is present at the facility.

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SPCC Compliance Costs

This section presents the costs of compliance with SPCC rule requirements for each size of hypothetical asphalt product manufacturing facility. Exhibit K-11 presents the costs of compliance for each SPCC rule requirement applicable to asphalt facilities. In the table, a row is colored gray if the cost incurred is expected to change due to the proposed amendments. The total annualized cost of compliance includes the annualized value of all one-time initial investments that the facility has to make (fixed costs), such as secondary containment around bulk storage containers and the recurring annual cost related to inspections and training. EPA assumed different estimates for lifetime periods for various compliance activities: 15 years for all fixed structures (except earthen berms) and initial SPCC Plan, 10 years for earthen berms, 12 years for integrity testing, and 5 years for PE certification (based on the rule requirement). To annualize the fixed costs, EPA used the Accelerated Recovery System (U.S. Code, 2007) for determining the depreciation period for various compliance structures. Therefore, for the depreciation period, the Agency used the following estimates: 10 years for all fixed structures (except earthen berms) and initial SPCC Plan, 6 years for earthen berms, 7 years for integrity testing, and 5 years for PE certification.

The capacity tiers are defined as follows: Category I (1,320-10,000 gallons); Category II (10,001 to 42,000 gallons); Category III (42,001 to 1,000,000 gallons); and Category IV (more than 1,000,000 gallons). The cost estimates are based on specific assumptions for facility characteristics and are not expected to be representative of the cost of a typical facility. Further, the estimates capture the variability in the cost (1) across the facilities of different sizes within the same broad size category (e.g., a different number of storage containers and/or containers of different sizes) and (2) across different methods or materials used to comply with SPCC requirements (e.g., for the secondary containment requirement, a concrete structure versus an earthen berm around an oil storage tank). However, these estimates do not take into account the geographical variability of regulated facilities. Therefore, these estimates only provide an illustrative example for facilities in each size category.

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Exhibit K-11
Cost of Compliance with SPCC Requirements for Hypothetical Asphalt Facility Using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
SPCC Plan				
Prepare SPCC Plan[2]	$552	$1,100	$1,610	$2,390
Certification of SPCC Plan	$365	$729	$1,090	$1,640
Anti-Corrosive Measures				
Coatings or cathodic protection to protect buried piping[3]	N/A	$180	$856	$856
Pipe supports[4]	$98	$98	$2,050	$3,080
Facility Drainage §112.9(b)				
Restrain drainage from diked storage areas using valves of manual, open-and-close design[5]	$746	$746	$1,490	$2,240
Secondary Containment§112.7(c), §112.9(c)				
Bulk storage containers – Earthen berms[6]	$485	$1,260	$5,190	$15,800
Bulk storage containers – Concrete berms[6]	$1,640	$4,360	$15,700	$49,600
Mobile/portable oil storage containers[7]	$288	$288	$288	$288
Transfer areas (other than loading/unloading racks)[8]	$956	$956	$956	$956
Drain covers and spill kits[9]	$121	$121	$242	$363
Piping[10]	$150	$150	N/A	N/A
Security				
Fully fence the facility[11]	$611	$698	$2,530	$3,890
Security measures for valves[12]	$58	$58	$194	$290
Lighting[13]	$319	$319	$3,190	$4,790
Cap and blank-flange terminal connections at the transfer point	$22	$22	$97	$131

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Exhibit K-11
Cost of Compliance with SPCC Requirements for Hypothetical Asphalt Facility Using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
and marking it as to origin when the piping is not in use[14]				
Training §112.7(f)				
Prepare for and hold training. Describe trainings provided for facility personnel.[15]	$1,110	$2,160	$2,160	$2,160
Prepare for and hold discharge prevention briefings.[16]	$717	$1,380	$1,380	$1,380
Train a designated person responsible for discharge prevention.[17]	$107	$107	$107	$107
Testing/Inspections §112.9(b)(c)(d)				
Pumps, ejectors, dikes, and containers[18]	$643	$1,290	$1,290	$1,290
Integrity testing of aboveground bulk storage containers with secondary containment[18]	$278	$1,110	$2,230	$4,450
Steam return and exhaust lines[18]	$322	$322	$322	$322
Integrity and leak test buried piping[3]	N/A	$126	$253	$253
Liquid level sensing devices[18]	$643	$1,930	$7,080	$18,000
Inspect piping for deterioration and corrosion[18]	$322	$322	$3,220	$3,860
Aboveground valves, piping and appurtenances[18]	$322	$322	$3,220	$3,860
Observe effluent treatment facilities to detect discharge[19]	$643	$643	$643	$643
Impracticability Determination §112.7(d)				
Aboveground piping[20]	N/A	N/A	$861	$1,260

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Exhibit K-11
Cost of Compliance with SPCC Requirements for Hypothetical Asphalt Facility Using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV
Other Measures				
Install liquid level sensing devices[21]	$1,710	$1,710	$3,420	$5,130
Equip the final discharge of ditches with a diversion system[22]	$176	$176	$345	$868
Warn all vehicles entering the facility[23]	$370	$370	$769	$1,150
Provide two pumps[18]	$27	$27	$27	$27
Recordkeeping and Discharge Reporting				
Discharge reporting[24]	$129	$129	$131	$136
Recordkeeping[25]	$407	$407	$500	$500
Total				
Total cost of complying with SPCC requirements – Minimum[26]	**$12,700**	**$19,300**	**$47,700**	**$82,100**
Total cost of complying with SPCC requirements – Maximum[26]	**$13,800**	**$22,400**	**$58,300**	**$116,000**
Average total cost of complying with SPCC requirements	**$13,300**	**$20,800**	**$53,000**	**$99,000**

1 The total cost of compliance is not the same as that used in Chapter 6 of Volume I of the RIA because this profile presents all possible costs that a facility can incur. The cost of compliance presented in Chapter 6 accounted for the percentage of facilities that face certain costs: amending the plan, discharge reporting.

2 Assess areas at the facility for the potential of an oil discharge to determine appropriate prevention measures; prepare a discussion of conformance with applicable more stringent state rules, regulations and guidelines in the SPCC Plan and organize parts of the SPCC Plan to be used in reporting a discharge and during an emergency. Assume that a new facility already has an accurate facility diagram for its own purposes. The amendment that will allow a new production facility to delay preparation and implementation of an SPCC Plan is not expected to change the cost of compliance. (Cost estimates: SCS Engineers.)

3 Assume that Category I facilities have no underground piping; Category II facilities have 50-200 feet of underground piping; Category III and IV facilities have

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Exhibit K-11
Cost of Compliance with SPCC Requirements for Hypothetical Asphalt Facility Using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV

200-500 feet.

4 Assume that Category I and II have 50 feet of 4-inch aboveground piping with 6 pipe supports; Category III has 1,000 feet of 4-inch aboveground piping with 125 supports; and Category IV has 1,500 feet of 4-inch aboveground piping with 188 supports.

5 For Category I and II: 1 drainage area; for Category III, 2 drainage areas; and Category IV, 3 drainage areas. Cost is given at a range of $480-$680 per drainage area for manual open and closed design, or a range of $800-$10,000 per drainage area for a hydrophobic/oleophilic drain shutoff system (depending on "size and complexity of facility"). (Source: SCS Engineers.)

6 Assume, for purposes of secondary containment, that Category I has either: (A) 1x 1,000 gallon aboveground storage tank or (B) 1x 10,000 gallon AST. Category II has either (A) 1x 1,000 gallon AST and 1x 10,000 gallon AST; or (B) 1x 1,000 gallon and 3x 10,000 gallon ASTs; the 3x 10,000 gallon tanks are in a common containment area. Category III has either (A) 3x 20,000 gallon ASTs; or (B) 2x 25,000 gallon ASTs and 3x 50,000 gallon ASTs in a common containment area, and 3x 100,000 gallon ASTs in a second common containment area. Category IV has either (A) 4x 25,000 gallon and 2x 50,000 gallon tanks in a common containment area, 4x 50,000 gallon and 1x 100,000 gallon tanks in a common containment area, and 5x100,000 gallon tanks in a common containment area; or (B) 4 containment areas, each with 3x 100,000 gallon ASTs. (Source: SCS Engineers.)

7 Assume 1,000-gallon containers. Estimates provided by SCS Engineers.

8 Assume that a masonry berm and doorway spill barrier fill this role. Trucks are constantly in and out of the area, so no permanent containment is possible. (Source for cost estimates: SCS Engineers.)

9 Smaller spill kits contain incidental discharges up to 6 gallons (to maintain on a vehicle). Several larger discharge kits are designed to control and clean up a discharge up to 30 gallons (include sorbent towels, booms, disposal bags, and personal protective equipment such as splash-resistant gloves).

10 Assume the following lengths for double-wall, 4-inch piping. Category I and II have 50 feet; Category III has 1,000 feet and Category IV has 1,500 feet. For Category III and IV, this is 500 feet per containment area. (Source: SCS Engineers.) Assume that Category I and II facilities will implement secondary containment, but that Category III and IV facilities will determine secondary containment for piping to be impracticable. (Source: Site visits to facilities. Costs based on SCS Engineers estimates.)

11 SCS Engineers provided estimates for fencing costs for the following facility sizes: Category I: ½ acre; Category II: 2 acres; Category III: 5 to 10 acres; Category IV: 10 to 20 acres.

a12 Assume 2 locking valves per loading or containment area. (Source: SCS Engineers.)

13 Assume one 10’ pole with 150-watt light, and 20’ of trenching for electrical wires, for each loading/unloading area. (Source: SCS Engineers.)

14 Assume $100 per blank-flange and 1 hour of technical labor. Category I and II facilities have 1 flange; Category III has 4 flanges; Category IV has 6 flanges. (Source: SCS Engineers.)

15 Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 20 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers.)

16 Assume that annual training at Category III and IV facilities will require 2 hours of managerial time; 12 hours of technical time; and 2 hours of clerical time. (Source: SCS Engineers.)

17 Oil handling personnel attend annual briefings to ensure adequate understanding and effective implementation of the SPCC Plan. Requires 2 hours of technical time per year. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production

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Exhibit K-11
Cost of Compliance with SPCC Requirements for Hypothetical Asphalt Facility Using In-House and Professional Labor[1] (2007$)
(7% Discount Rate)

Baseline Cost - Before Promulgation of 2008 SPCC Rule Amendments	Category I	Category II	Category III	Category IV

facilities, Humble, TX, February 2007; Scott Baker, Supervisor at Environmental Engineering Department at Sunoco petroleum refinery, Philadelphia, PA, February 2007; Kirk Saunders, Vice President at White Mountain Oil and Propane, North Conway, NH, December 2006; Mike Brower/Mike Chow, Facility Operations Manager/Environmental Services Support at Rhodia Chemical Manufacturing, Freeport, TX, January 2007.)

[18] Source for cost estimates: SCS Engineers.

[19] Assume that effluent treatment facilities are present. (Based on SPCC Plan for Cargill, Inc., Lafayette, Indiana, September 2006.)

[20] Secondary containment for aboveground piping is considered to be impracticable for Category III and IV facilities. Source for cost estimates: SCS Engineers.

[21] Source for cost estimates: SCS Engineers. Assume 1 Scully signal per loading/unloading area, and 1 loading/unloading area for Category I and II, 2 loading/unloading areas for Category III, and 3 loading/unloading areas for Category IV.

[22] Assume Category I and II facilities have 100 linear feet of ditches; Category III has 200 linear feet; and Category IV has 500 linear feet. (Source: SCS Engineers.)

[23] Assume vehicle warning consists of one of the following: (1) Warning signs – 1 for Category I and II; 2 for Category III; 3 for Category IV; (2) Bollards – 10 for Category I and II; 20 for Category III; 30 for Category IV; (3) Guard rails – 25’ x 25’ for Category I and II; Category III: 70' x 100' (area 1) and 70' x 120' (area 2); Category IV: 70' x 100' (area 1). 90' x 100' (area 2), 84' x 120' (area 3). (Source: SCS Engineers.)

[24] Assume that discharge reporting requires 1 hour of managerial and 1 hour of technical labor each year, plus $14 in mailing costs for Category I and II, and $16 in mailing costs for Category III. (Source: SPCC ICR 2002; U.S. Postal Service rates for 2007.)

[25] One-time cost of $300 for purchasing a file cabinet/setting up the office. (Source: site visits to oil production and non-production facilities: Hector Cavazos, regulatory advisor for Chevron oil production facilities, Humble, TX, February 2007.)

[26] Total costs may not exactly match a sum of individual cost components due to rounding.

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APPENDIX L

EPA Response to DOE Industry-Specific Analyses

In 2006, the U.S. Department of Energy (DOE) provided EPA with six draft assessments of the costs and potential energy impacts of the 2002 amendments to the Spill Prevention, Control, and Countermeasure (SPCC) rule on specific industries:

- Petroleum Bulk Storage Facilities and Distribution Terminals
- Oil and Natural Gas Production
- Electric Utility Substations
- Petroleum Refineries
- Oil and Natural Gas Pipelines
- Nuclear Power Plant Emergency Diesel Generator Tanks

Either the Argonne National Laboratory or Advanced Resources International Inc. prepared each of the reports for the DOE Office of Fossil Energy. In revising the Regulatory Impact Assessment for the final amendments to the Oil Pollution Prevention regulation (40 CFR part 112), EPA reviewed and considered the draft reports made available by DOE. This chapter summarizes EPA's conclusions regarding the cost and potential energy impact assessments as a whole, as well as more specific comments on the individual industry-specific reports.

Overall Response to DOE Assessments

Although EPA appreciates DOE's efforts to estimate the costs and potential energy impacts of the SPCC rule, it is important to note that the assessments do not explicitly consider the relief provided by the 2006 amendments to the SPCC rule, which, for example, provided an option for owner/operators of certain qualified facilities to self-certify their SPCC Plan in lieu of certification by a Professional Engineer (PE).

In addition, in reviewing the six draft reports, EPA made several observations that compromise the utility of the reports and underlying research, as well as call into question the results of the assessments themselves. Most importantly, many key assumptions lack documentation. Often, they are not supported by studies, qualified sources, or documented industry practices. Further, EPA believes that the analyses were constructed in a way that is likely to overstate substantially the cost of compliance with the SPCC rule, based on the estimates of the regulated universe and facility-specific compliance costs. The analyses also focus exclusively on capital costs and do not address ongoing, annual operating and maintenance costs for SPCC compliance.

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Petroleum Bulk Storage Facilities and Distribution Terminals

In its draft report, "Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements for Petroleum Bulk Storage Facilities and Distribution Terminals,"[56] DOE estimated that the total capital cost to bring this sector into compliance with the 2002 SPCC rule could range from $285.5 million to $808.7 million. DOE estimated that secondary containment costs for tanks, oil-filled equipment, loading racks, and piping within petroleum bulk plant stations and petroleum bulk stations account for 57 percent of the total incremental compliance costs. DOE estimated that average costs for SPCC compliance could range from $19,000 to $53,000 per facility for small petroleum bulk plants, from $41,000 to $97,000 per facility for larger petroleum bulk plants and bulk stations, and from $156,000 to $227,000 per facility for petroleum terminals. DOE concluded that SPCC compliance costs disproportionately impact smaller petroleum storage and distribution facilities, which, when combined with other factors, could lead to closure and consolidation of smaller petroleum terminals, marginally economic petroleum bulk plants, or low-volume specialty product distributors. Such closure could result in energy impacts such as seasonal shortages of petroleum products and higher prices and increased price volatility for petroleum products in local distribution markets. However, DOE also noted that, given the size of the petroleum bulk storage and terminal sector, the potential impact of SPCC compliance costs on product prices are diluted.

EPA does not believe that the DOE assessment of petroleum bulk storage facilities and distribution terminals presents a substantive case that the compliance costs of the SPCC rule could cause, in any meaningful way, a material energy impact. EPA believes that the DOE assessment overstates the cost impacts of the 2002 SPCC rule, and that DOE defined compliance cost scenarios that are conceptually flawed and undermined by uncertainties in key variables. For example, DOE estimates a larger facility universe and more tanks and equipment per facility than those cited by EPA. Such major differences between estimates of this facility universe are unexpected because the sector has been extensively surveyed and analyzed. EPA's estimate is consistent with that of the U.S Economic Census and other government sources, whereas DOE did not substantiate its logic for developing its alternate estimate in a manner that ensures its validity. In assessing the 2002 amendments to the SPCC rule, the DOE assessment also assumes that this rule imposed requirements affecting this sector for the first time. In fact, the rule has been in effect since 1974, which clearly has implications for the estimates of compliance costs. Further, DOE assumed that none of the bulk storage facilities are in compliance with the SPCC rule, which does not appear reasonable.

In addition, the DOE assessment of potential energy impacts stems entirely from the alleged impact of SPCC compliance costs on the business viability of marginal bulk storage/distribution facilities and the potential for facility closures to disrupt product supply and distribution networks.

[56] Advanced Resources International, Inc., for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements for Petroleum Bulk Storage Facilities and Distribution Terminals (Draft).

This argument is largely hypothetical and provided no evidence of presence of marginal facilities in this business segment or the impact of SPCC compliance costs on their viability. Further, EPA was not persuaded by the example given of the Williams Company, which did not include a discussion of the overall size of the company (approximately $12.5 billion in revenue for each 2004 and 2005) relative to the $2.4 million capital outlay, nor consideration of the outlay charged against income over the estimated life of the outlay.

Oil and Natural Gas Production

In its draft report, "Assessment of the Potential Costs and Energy Impacts of the Spill Prevention, Control, and Countermeasure Requirements on U.S. Oil and Natural Gas Production,"[57] DOE estimates compliance costs based on two scenarios (2002 and 2005 wellhead crude oil and natural gas prices). Using the 2005 price scenario, DOE estimates that the U.S. oil and natural gas production industry would spend $4.7 billion to comply with the 2002 SPCC rule. It further predicts that shut-in crude oil production would amount to nearly 55,000 barrels per day, or 2 percent of U.S. oil production. Shut-in natural gas production would amount to nearly 43 billion cubic feet annually, or less than 1 percent of natural gas production. Because of the lost production, DOE estimates that public and private royalty holders could lose approximately $140 million in revenues. State and local governments could lose more than $138 million in severance and *ad valorem* taxes, and $211 million in state income taxes. The federal government could lose more than $1.6 billion in federal income tax receipts. DOE attributes $1.5 billion of the compliance costs to marginal wells. They estimate that by exempting the marginal wells, no crude oil or natural gas production would be shut in and no royalties or severance and *ad valorem* taxes would be lost. In addition, they predict that the state/local governments would lose only $50 million, and the federal government would lose only $460 million in income taxes. DOE concludes that based on its assessment the SPCC requirements could very likely represent a "significant regulatory action" as defined by Executive Order (EO) 12866[58] or a "significant energy action" as defined by EO 13211.[59]

EPA has questions and concerns regarding the rationale for DOE's assumptions, the validity of the analytic concept used to estimate the decrease in oil and natural gas production, and the transparency of the calculations of economic and energy impacts. DOE often cited both its universe estimate and the estimates of EPA, but despite major disparities between the two, DOE made no attempt to reconcile the disparities or explain why the universe counts relied upon in the assessment are more appropriate. The effect of these disparities in universe estimates is that DOE's estimated energy and economic impacts are significantly higher than those that would be calculated using EPA's estimates.

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[57] Advanced Resources International, Inc., for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements on U.S. Oil and Natural Gas Production (Draft).

[58] Executive Order 12866, Regulatory Planning and Review, 58 FR 51735, October 4, 1993.

[59] Executive Order 13211, Actions That Significantly Affect Energy Supply, Distribution, or Use, 66 FR 28355, May 22, 2001.

In reviewing the DOE assessment, EPA notes that it does not provide an explanation of why the oil and natural gas price conditions in 2002 and 2005 are appropriate bases upon which to develop low/high scenarios of the impacts of the 2002 SPCC rule. Given the higher prices of 2006 and the likelihood of sustained high oil and gas prices into the future, EPA believes the 2002 price scenario is of little relevance to understanding the potential impact of the SPCC rule and further recommends the use of forecasted pricing conditions.

Another major cost-driver in the estimation of energy and economic impacts is the assumptions made regarding which set of actions a facility will pursue to comply with the 2002 SPCC rule. However, the DOE assessment provides little discussion about the bases for the percentage allocations of the five sets of actions it identifies. DOE refers to “operator surveys” for statistics on the various sets of actions taken to date, and EPA would appreciate an opportunity to review these surveys to validate their reasonableness for use as a material input to the analysis of SPCC rule impacts.

Limited information was provided on the details of this analysis; however, if EPA understands correctly how the analysis was performed, it suffers from several material flaws that undermine its credibility for use in estimating potential impacts of the SPCC rule. EPA believes that a more appropriate analysis of the potential shutdown effect of SPCC compliance costs should not be based on a single-year analysis of change in operating income. Because the current analysis charges the non-annually recurring costs against one year of operations, it will overstate, perhaps substantially, the potential for operating wells to become candidates for shutdown as a result of the SPCC rule. In addition, DOE’s analysis fails to consider the possibility that a shutdown of oil and gas production may not be irrevocable, which is another source of overstatement of the potential impact of the SPCC rule on U.S. oil and gas production.

The analysis uses actual well operating profiles from 2002 in conjunction with production costs and product prices from 2002 and 2005. It is appropriate to use the costs and prices for 2002 in conjunction with the well operating profiles for 2002. However, using the 2005 cost and price information with the 2002 well operating profiles is conceptually inconsistent. Such an error does not lead to an overstatement of production impacts from the SPCC rule, but calls into question the validity of the overall analysis. EPA notes that producing well data are now available for 2004, which would also allow for a more current analysis of how the distribution of marginal production wells changes in response to changes in oil and gas production economics.

In estimating SPCC compliance costs, DOE does not explore potential variability around its cost estimates, including the potential scale efficiencies that industry may able to achieve in revising or developing new SPCC Plans. In estimating aggregate compliance costs, the number of wells/operating sites that would be subject to the rule is clearly a major determinant of the estimated total cost. The analysis does not consider the possibility that marginal wells could be a qualified facility, which would allow for a self-certified SPCC Plan.

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The DOE assessment assumes that all decreases in crude oil and natural gas production stem from shutting down marginal wells that are no longer economically viable in the face of SPCC compliance costs. EPA believes that the analysis contains substantial conceptual errors and that these errors likely lead to substantial overstating of the impact of the SPCC rule on domestic oil and gas production. Similarly, EPA believes that the estimated revenue losses to public and private royalty holders and tax revenue losses are analyzed in a manner that considerably overstates the potential impact of the SPCC rule.

Electric Utility Substations

In its draft report, "Assessment of the Potential Costs and Energy Impacts of the Spill Prevention, Control, and Countermeasure Requirements for Electric Utility Substations,"[60] DOE focused on the requirements for secondary containment and the subsequent costs and outages that compliance would impose. The utility industry estimates an average cost of $45,000 per facility to install general secondary containment and higher costs for installing sized secondary containment, and predicts that the installation of either could lead to outages during construction (approximately 2 to 4 weeks). Using a midpoint estimate of 65,000 substations, DOE identified a $3 billion compliance cost to retrofit existing substations with secondary containment, which is equivalent to about 1.5 percent of the total electric utility revenues in 2004. DOE believes that the compliance costs are high enough to cause energy supply disruptions by disproportionately affecting consumers in certain locations or by utilities postponing or forgoing other capital investments needed to meet the increasing demands of users.

It is important to note that DOE commented on several issues that were addressed by the December 2006 amendments to the SPCC rule, such as secondary containment for oil-filled operational equipment. The 2006 final rule significantly reduced SPCC compliance cost burdens and potential energy impacts associated with electric utility substations. As such, the final rule renders much of the DOE assessment of the impact of the 2002 SPCC rule moot. That notwithstanding, EPA believes that the DOE assessments overstate the costs of SPCC compliance and potential energy impacts.

DOE provides only limited documentation on the estimated number of affected facilities, which differs considerably from the documented universe estimate EPA provides in its Regulatory Impact Analysis (RIA). Similarly, the estimated cost of compliance at affected facilities is only documented as "electric utility industry estimates." These two pieces of data are fundamental to the $3 billion estimated cost of SPCC compliance at electric power substations.

However, even if the $3 billion estimate were reasonably accurate, it would represent a very small addition to the total installed plant and equipment asset base for the U.S. electric power industry. The installed plant and equipment asset base net of depreciation amounts to

[60] Argonne National Laboratory, for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements For Electric Utility Substations (Draft).

approximately $650 billion,[61] and the DOE estimated compliance cost would represent less than 0.5 percent of the installed asset base. Instead of comparing the compliance cost to industry revenue, EPA believes that comparison with industry assets provides more meaningful information on the potential financial burden. In addition, an SPCC compliance outlay is not an ongoing expense, but instead a capital outlay for an asset that will provide service for an extended period with only minimal recurring maintenance expenses.

The DOE assessment implies that this outlay could burden the power industry by competing for the industry's financial resources for undertaking other plant and equipment improvements. EPA does not recognize the validity of this argument. For the most part, the transmission and distribution electric power segments operate within the remaining regulated utility industry framework. As such, the SPCC compliance outlays would be placed into the rate base and recovered through the regulated electricity rate structure. The DOE assessment also implies that the outlays could induce electricity rate increases that would burden customers. While any rise in electricity prices could be of concern, the fact that these costs would be recovered over a substantial number of years would substantially mitigate the potential price effect of the outlays.

Finally, EPA believes that DOE underestimates the ability of industry to successfully apply innovative approaches to minimize compliance costs, and suggests consideration of industry best practices and successes. Further, with respect to service outages for the installation of secondary containment, EPA believes it would have been more appropriate to focus on the incremental increase in outage days, if any, given that transformers are subject to periodic outages for other maintenance.

Petroleum Refineries

In its draft report, "Assessment of the Potential Costs and Energy Impacts of Spill Prevention, Control, and Countermeasure Requirements for Petroleum Refineries,"[62] DOE estimates that the total capital cost of bringing oil refineries into compliance with the 2002 SPCC rule could range from $151.8 million to $547.9 million. DOE estimated that secondary containment costs range from 73 percent to 83 percent of the compliance costs because of oil-filled process equipment, piping, and truck and rail loading areas, and that leak detection and integrity testing could account for 11 percent to 23 percent of the total compliance costs. Incremental costs to fully comply with the SPCC requirements are estimated to range from $252,000 to $805,000 for a small refinery, $523,000 to $1,790,000 for a medium-sized refinery, and $1,979,000 to

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[61] Edison Electric Institute, Balance Sheet, Q1 2006 Financial Update, available at: http://www.eei.org/industry_issues/finance_and_accounting/finance/research_and_analysis/quarterly_financial_updates/Q1_2006_BalanceSheet.pdf.

Energy Information Administration, Public Electric Utility Database, Form EIA-412 Database Annual Electric Industry Financial Report, 2003, available at: http://www.eia.doe.gov/cneaf/electricity/page/eia412.html. The EIA data are for 2003, which is the final year of publication of this data series.

[62] Advanced Resources International, Inc., for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements for Petroleum Refineries (Draft).

$7,296,000 for a large refinery. DOE asserts that the impact of the SPCC rule and other compliance requirements could lead to the closure of smaller regional refineries and have regional implications for crude oil production.

EPA believes that the DOE assessment is somewhat simplistic and will tend to overstate the potential impact of the SPCC rule on the petroleum refining sector. In addition, DOE has not undertaken the more substantive analyses that would be needed to confirm whether meaningful energy impacts would be likely to result from the SPCC rule.

In developing its compliance cost estimates, DOE focuses on the "capital cost" or "initial compliance costs" of bringing facilities into compliance. The analysis does not address any ongoing annual operation and maintenance-type costs for rule compliance. That aside, the compliance cost estimation procedure seems reasonable; however, the cost estimates rely on numerous unsubstantiated assumptions (e.g., number of equipment items by refinery size for which a compliance action would be required, estimated fraction of facilities by size for which a compliance action would be required for each equipment item). DOE acknowledges that the estimates of numbers of equipment items requiring an action are "first order assumptions for the purpose of an initial screening estimate of potential SPCC compliance impacts" and the fraction of facilities for which equipment-related compliance actions would be required is based on "best professional judgment."

The report describes the aggregate SPCC compliance costs as "significant" at the national level based on comparison of compliance cost outlays with total refining industry income and comparison of the compliance cost outlays with the industry's historical level of capital expenditures. Both comparisons are flawed conceptually and are structured in a way to overstate the significance of the outlays required potentially for 2002 SPCC rule compliance.

DOE calculated total industry income by subtracting total cost of materials, total production worker wages, and total capital expenditures from total value of shipments by the refining industry. EPA believes that the subtraction of total capital expenditures to derive even an approximation of net income is conceptually incorrect since the total value of capital expenditures would not be charged against net income during the period of the outlay. Instead, presuming by their nature that capital expenditures yield business value over a multi-year period, the reported value of capital expenditures would be depreciated over several years, and only the current depreciation charge would be subtracted from revenue in calculating the current year's net income. Similarly, DOE repeats this error when it then compares total compliance cost outlays with the calculated income value and represents this comparison as a basis for concluding that the outlays for the 2002 rule are "significant." Regardless of the specific analytic method, a more meaningful comparison would most likely use a substantially lower one-year annual charge for the comparison than the total estimated outlay. As a result, the current finding of economic/financial impact would be similarly reduced.

The DOE assessment compares the capital outlay value with the refining industry's capital expenditures for 2002, as reported in the Economic Census. There are conceptual weaknesses

in the way that DOE made this comparison. First, the current estimated dollar value of outlay (presumed to be in 2006 dollars) is compared with a 2002 value, which ought to have been brought forward to a consistent dollar-year with the current year estimate. Second, EPA believes that a more meaningful comparison would be made by looking at the estimated compliance cost outlay in relation to several years of the industry's historical level of capital outlay. EPA recalculated the estimates based on these recommendations, finding that the estimated outlay for SPCC rule compliance would range from 1.9 to 2.8 percent, for the low-cost case, and 6.8 to 10.3 percent, for the high-cost case, of the industry's total capital expenditures for each of the five years, 2000 through 2004. However, over the full five years – which EPA believes puts these outlays in a better context of significance to the industry – estimated SPCC compliance outlays as a percentage of total capital expenditures would fall to between 0.4 and 1.6 percent. On the whole, EPA judges this implied level of capital outlay to be quite small in relation to the financial resources of the total petroleum refining industry.

Another similar comparison that DOE could have made would have involved looking at the estimated SPCC compliance outlay in relation to the total asset base of the petroleum refining industry. At end-of-year 2002 (latest year available), total industry depreciable assets stood at approximately $89.5 billion (2006$). The estimated SPCC compliance outlay would amount to a very small 0.17 percent to 0.61 percent of this total depreciable asset value.

Further, EPA believes it would be possible to assess the ability of individual refining firms to finance the outlays estimated by DOE to be required for SPCC compliance, and to gauge the impact of these outlays on firm financial performance and business value. From a quick review of firms identified as operating in the refining sector by the Standard & Poor's financial market information service, financial data are available for several U.S. publicly traded firms whose business is entirely or almost entirely in the petroleum refining sector. Data are also available on the number of refineries owned by these firms and could be used to develop an approximate estimate of SPCC compliance costs for these firms.

DOE describes the possibility of energy impacts, but presents no meaningful analysis of their potential occurrence. This argument could have validity; however, the DOE report contains no hard data or analysis clarifying the presence of such situations and/or the amount of crude oil production that could be affected in this way. As a result, EPA believes that DOE's suggestion of this potential impact is merely conjectural.

Oil and Natural Gas Pipelines

In its draft report, "Assessment of the Potential Costs and Energy Impacts of the Spill Prevention, Control, and Countermeasure Requirements for Oil and Natural Gas Pipelines,"[63] DOE estimates that the total incremental capital cost to bring all crude oil, petroleum product,

[63] Advanced Resources International, Inc., for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements for Oil and Natural Gas Pipelines (Draft).

and natural gas pipelines into compliance with the SPCC rule could range from $62.5 million to $297 million. Secondary containment costs for breakout tanks, oil-filled equipment, loading racks, and piping at these facilities could account for between 47 percent and 58 percent of the total incremental compliance costs. For its high-cost scenario, which is based on more liberal universe and compliance estimates, initial SPCC compliance costs could be as much as 3 percent of oil pipeline revenue. DOE concluded that the potential impact of SPCC compliance would be much less on natural gas pipelines than on oil pipelines, representing only 0.5 percent of the natural gas pipeline revenue (high-cost scenario). Based on its analysis, DOE determined that "SPCC compliance costs alone may be unlikely to result in negative energy impacts."

DOE asserts that the oil pipeline compliance costs need to be considered in the context of multiple, geographically dispersed facilities owned by the same company and other environmental and public safety compliance costs. Further, DOE also states that marginal oil pipelines probably exist, making truck transportation a likely substitute in these circumstances, which is less efficient and could result in higher prices for petroleum products in local markets. Finally, DOE acknowledges that its assessment should be viewed as an initial screening of potential impacts of SPCC compliance.

EPA believes that because of the uncertainties in the analysis, the DOE assessment should not be relied upon for decision-making purposes. The report does not provide sufficient references or document assumptions regarding the universe estimates, which vary considerably from those developed by EPA. Part of the difference between the DOE and EPA universe estimates appears to result from differing assumptions about the equipment and operations that are subject to the SPCC rule, such as breakout tanks. EPA believes that the cost estimates for secondary containment are also weakened by not providing the basis for the assumptions on the percentage of facilities that will need to install or upgrade secondary containment, assuming that a significant number of breakout tanks would be subject to the SPCC rule, and assuming that tanks would not be co-located at a facility. As a result, EPA believes the DOE assessment substantially overstates the cost for secondary containment. The development of low- and high-cost scenarios is driven by universe estimates instead of facility-level variations in the cost to implement specific requirements of the rule. The two scenarios are not realistic outcomes, as they represent two extreme situations instead of the statistical mode of the relevant parameters. EPA was also struck that DOE did not use the EPA universe estimate as one of its cost scenarios. The American Society of Testing Materials (ASTM) identifies several approaches for estimating costs of environmental matters,[64] including the expected value, which EPA believes could have been a more meaningful analysis.

EPA disagrees with DOE's approach to implicitly treating the outlays for SPCC compliance as though these costs recur annually. To argue that the SPCC compliance costs could present a substantial economic/financial burden, DOE compares the total estimated outlays to industry annual revenue for 2002. Given that the SPCC outlays would be expected not to recur annually

[64] ASTM Standard E-2137, Standard Guide for Estimating Monetary Costs and Liabilities for Environmental Matters. November 2006.

and would be expected to yield a compliance and operations benefit extending over a substantial number of years (e.g., secondary containment installations can last for decades, with only very modest periodic maintenance outlays), a more meaningful measure of economic/financial significance would have compared an annualized value of the initial outlays with annual revenue. In this case, the comparison would have found that compliance costs represent a much lower percentage of revenue – even under the substantially overstated "high-cost scenario." For example, if the initial outlay for oil pipelines is annualized over the very short period of 5 years at a 7 percent discount rate (OMB advised cost-of-capital for analyzing the financial impact of compliance outlays), the cost-to-revenue percentage would fall from 2.9 percent to 0.4 percent. At longer annualization periods – which would be appropriate for the more costly components of the compliance outlay – the implied cost burden falls farther: at 10 years, the cost-to revenue percentage is 0.4 percent and at 15 years, 0.3 percent.

To determine whether the SPCC rule is likely to have material energy impacts, DOE's hypothesis that the impact of the SPCC rule on "marginal oil and gas pipelines" in turn has impacts on associated oil and gas production operations that need to be explored in terms of actual occurrence and by citing other studies or examples of pipeline shutdowns due to financial viability issues. EPA believes that because and gas prices have been increasing and production has been falling, it is reasonable to assume that the resulting higher prices have been sufficient to keep "marginal" pipelines operational. Further, DOE's focus on revenues per pipeline mile may be somewhat misplaced as an indicator of sector vulnerability, as profits per pipeline mile may be a better metric.

The analysis includes an assumption that the 2002 SPCC rule imposed requirements on this sector for the first time, rather than considering the requirements that date back to 1974. Considering the two compliance perspectives in estimating compliance costs could strengthen the analysis. Further, DOE assumed that none of the pipeline facilities are in compliance with the SPCC rule, which does not appear reasonable.

Nuclear Power Plant Emergency Diesel Generator Tanks

In its draft report, "Assessment of the Potential Costs and Energy Impacts of the Spill Prevention, Control, and Countermeasure Requirements for Nuclear Power Plant Emergency Diesel Generator Tanks,"[65] DOE identifies the potential for installation of secondary containment and other compliance-related operations on emergency diesel generator tanks to require outages of nuclear generating units, which would reduce their availability for electric power generation. DOE builds the case that SPCC could have a significant energy impact within the meaning of EO 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use. Specifically, the analysis attempts to demonstrate that the unit outages assumed to be required for installing secondary containment and/or conducting integrity and

[65] Argonne National Laboratory, for Department of Energy Office of Fossil Energy. 2006. Assessment of the Energy and Economic Impacts of Potential Spill Prevention, Control, and Countermeasure Requirements for Nuclear Power Plant Emergency Diesel Generator Tanks (Draft).

leak testing could cause a reduction in electric power generation in excess of the one billion kilowatt-hours per year threshold for having a "significant adverse effect" as established by the Office of Management and Budget in its guidance for implementing EO 13211.[66] DOE also addresses the potential effects on nuclear facility operations and on retail electricity rates.

While certain elements of the DOE analysis are reasonable in concept, EPA believes that the analysis and findings rest on several key assumptions that are not well documented and may lead to considerable overstatement of the potential energy impacts of the SPCC rule on nuclear power operations. The estimated number of underground storage tanks that would require some compliance action under SPCC is largely unsubstantiated, as is the estimate of the number of nuclear plants with underground storage tanks. EPA also believes that the DOE assessment lacks adequate documentation of whether SPCC compliance actions would require any operational outages and the length of such outages.

In addition to the weakness of the assumptions and estimates underlying the analysis, DOE applied the OMB significant adverse effect threshold in a way that leads to an exaggerated, and perhaps erroneous, finding of the potential for the SPCC rule to cause a significant adverse effect in the electric power sector. The OMB guidance for implementing EO 13211 states that "Reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity" constitute a "significant adverse effect." DOE's use of this criterion to assess the SPCC rule's potential energy impact may be conceptually inappropriate and lead to an erroneous finding. Specifically, DOE applied the reduction in electricity generation from one year in its comparison with the OMB guidance threshold. Since the OMB guidance for this criterion uses the language per year, a more appropriate concept for measuring this impact would be to look at the annualized reduction in electricity generation, using a social discount rate to annualize the single year reductions over the expected performance life of the compliance action. Annualizing the single-year electricity production loss over 30 years at 3 and 7 percent discount rates would lead to equivalent-permanent-effect reductions of approximately 5 and 8 percent of the single-year loss, respectively. The potential energy impact of the SPCC regulation against this significant adverse effect threshold would be correspondingly reduced.

Finally, EPA was not persuaded by DOE's assertion that the cost of SPCC compliance could defer scheduled maintenance activities and jeopardize overall electricity supply. DOE's argument is not substantiated, and EPA does not see how such a circumstance could reasonably occur given the stringent maintenance requirements. If SPCC compliance actions needed to be undertaken against limited budgets, EPA expects that a more likely scenario is that company management would reallocate budgets to remain in compliance with nuclear unit maintenance specifications and roll these outlays into higher rates.

[66] Office of Management and Budget, Memorandum for Heads of Executive Departments and Agencies, and Independent Regulatory Agencies: Guidance for Implementing EO 13211, July 13, 2001.

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