Regulatory Assessment

Chemical Facility Anti-Terrorism Standards
Interim Final Rule

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Department of Homeland Security

Acronyms

ANR	Advance Notice of Rulemaking
CWC	Chemical Weapons Convention
DHS	Department of Homeland Security
EHS	Environment, Health and Safety
EPA	Environmental Protection Agency
FTE	Full-Time Equivalent
IED	Improvised Explosive Device
IFR	Interim Final Rule
MTSA	Maritime Transportation Security Act
NAICS	North American Industrial Classification System
PV	Present Value
RMP	EPA Risk Management Program
SSO	Site Security Officer
SSP	Site Security Plan
SVA	Security Vulnerability Assessment
VBIED	Vehicle Borne Improvised Explosive Device

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Executive Summary

On October 4, 2006 the President signed the Department of Homeland Security (DHS) Appropriations Act of 2007 (the Act) which provides the Department of Homeland Security with the authority to regulate the security of high-risk chemical facilities (see Pub L. 109-295, sec 550). This regulatory assessment was prepared in order to estimate the magnitude of the costs that chemical facility owners and/or operators will incur from implementing the accompanying Chemical Facility Anti-Terrorism Standards (CFATS) interim final rule (IFR) that is expressly required by the Act.

The intent of the IFR is to enhance the security at high risk chemical facilities to protect against terrorist attacks. A facility will be considered to present high levels of security risk if, in the discretion of the Secretary of Homeland Security, it presents a high risk of significant adverse consequences for human life or health, national security and/or critical economic assets if subjected to terrorist attack, compromise, infiltration, or exploitation. Implementing the appropriate risk-based performance standards would reduce the risk of terrorism to high-risk chemical facilities by reducing the attractiveness of a facility to attack as well as reducing the likelihood that an attack would be successful.

The IFR requires certain chemical facility owners and/or operators to comply with risk-based performance standards that will reduce the likelihood of a successful terrorist attack against the facility. A performance standard defines the required level of performance, but allows the owner/operator to specify the measures required to achieve that outcome, subject to DHS review and approval of the Site Security Plan (SSP) and an on-site inspection.

The IFR requires chemical facilities fitting certain risk profiles to register to use a DHS-secured web-based system to complete a Chemical Security Assessment Tool (CSAT) consequence assessment screening methodology (called Top-Screen) to determine a preliminary tier level. If the facility meets certain consequence thresholds, it will be required to complete a Security Vulnerability Assessment (SVA) and DHS would determine a final facility tier level and require sites to complete a SSP. Following certain facilities' submission of the SVA and SSP, DHS would review the SVA and SSP for compliance with the risk-based performance standards outlined in the IFR.

For the purposes of good business practice or regulations promulgated by other Federal and State agencies, many companies have already spent a substantial amount of money and resources to upgrade and improve security. The costs shown in this analysis do not include those resources that companies have already spent for security, but instead summarize best estimates of any incremental costs to comply with the IFR.

We recognize that chemical facilities will address the risk-based performance standards through a wide variety of security measures. The flexibility of performance standards may allow owners and/or operators to achieve the required level of risk and vulnerability reduction at a variety of costs. As a result, depending on each

company's choices, some companies could spend less than what is estimated herein while others could spend more. In general, we assume that each company will implement the IFR based on the type of facilities it owns or operates and the security risks each individual site presents.

This analysis presents a range of estimated costs if chemical facilities are operating at an "elevated" threat level (generally the level of operations since the events of September 11, 2001). The "elevated" threat level is also known as the "yellow" level defined by the DHS Homeland Security Advisory System (HSAS) color-coded threat level system. We also discuss the types of costs a chemical facility may incur while operating for a brief time at a "high" threat level (orange). Costs associated with operating at the "severe" threat level (red) are not discussed because such a condition would be very specific to the threat, incident or event and we do not have a good basis for estimating these costs.

The chemical facility population estimates herein are based on broad estimates of the number of facilities subject to the regulations as we do not know at this time the precise number of chemical facilities that will incur costs from complying with the IFR. After chemical facilities conduct the Top-screen, DHS will be in a better position to improve upon its estimate of the number of "high-risk" chemical facilities.

DHS currently estimates that as many as 50,000 facilities will register and complete a Top-Screen to better define the population of facilities to be covered by the IFR. Of the 50,000 that will complete the Top-Screen and subsequent SVA, DHS estimates that 1,500 to 6,500 facilities will be considered to be "high-risk" chemical facilities for the purposes of the IFR. For the purpose of generating the cost estimate required by Executive Order 12866, DHS's best estimate, based on currently available information, is that there will be 5,000 high-risk chemical facilities that will be required to comply with requirements of the IFR.

Using the point estimate of 5,000 high risk chemical facilities, the estimated present value cost of this interim final rule is $3.6 billion dollars over the period 2006-2009[1] (7 percent discount rate). For the purposes of illustration, we also have calculated the cost of the interim final rule over the ten year period 2006-2015. Over the period 2006-2015, DHS estimates the present value cost of this interim final rule would be $8.5 billion (7 percent discount rate).[2]

[1] Section 550 (b) of the Act states: "Interim regulations issued under this section shall apply until the effective date of interim or final regulations promulgated under other laws that establish requirements and standards referred to in subsection (a) and expressly supersede this section: *Provided,* That the authority provided by this section shall terminate three years after the date of enactment of this Act."

[2] The ten year estimate presented here is for purposes of comparison, as the authority provided by Section 550 terminates three years after the date of enactment of the Act. This ten year estimate reflects the compliance costs of these 5,000 facilities over the years 2006-2015. Such compliance costs include sustaining the required risk-based performance measures and submitting additional Top-screens, SVA's and SSP's in accordance with the IFR.

Table 1. Summary of Estimated Costs by Tier in $millions (2006-2009, 7 percent discount rate)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Tier 1	$589	17%	$173	15%	$768	17%
Tier 2	961	27%	289	25%	1,252	27%
Tier 3	1,318	37%	396	34%	1,714	37%
Tier 4	562	16%	169	15%	730	16%
Top Screen*	117	3%	117	10%	117	3%
Reclassified High Risk Facilities**	9	0%	9	1%	9	0%
SSP Hearings & Appeals	<1	0%	<1	0%	<1	0%
TSDB Appeals	6	0%	2	0%	8	0%
Total	**$3,562**	**100%**	**$1,155**	**100%**	**$4,598**	**100%**
Annualized Cost	**$1,357**		**$440**		**$1,752**	

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.

**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.

Table 2. Summary of Estimated Costs by Tier in $millions (2006-2009, 3 percent discount rate)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Tier 1	$671	17%	$197	15%	$875	17%
Tier 2	1,096	27%	329	25%	1,427	27%
Tier 3	1,510	37%	454	35%	1,964	37%
Tier 4	641	16%	192	15%	832	16%
Top Screen*	127	3%	127	10%	127	2%
Reclassified High Risk Facilities**	10	0%	10	1%	10	0%
SSP Hearings & Appeals	<1	0%	<1	0%	<1	0%
TSDB Appeals	7	0%	2	0%	9	0%
Total	**$4,062**	**100%**	**$1,312**	**100%**	**$5,245**	**100%**
Annualized Cost	**$1,436**		**$464**		**$1,854**	

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.

**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.

Considering all high-risk chemical facilities, on average, approximately 59 percent of the initial 3-year cost (primary estimate) for these facilities is for installing or upgrading equipment, 3 percent for completing the screening exercise, 3 percent for conducting the Security Vulnerability Assessment (SVA) and preparing the Site Security Plan (SSP), 11 percent for security guard services, 19 percent for Site Security Officers (SSOs) (excluding his/her time spent preparing the SVA/SSP or participating in these activities), 5 percent for personnel and readiness (background checks, training, drills, audits and visitor escorts). Over a 10-year analysis period, 38 percent of the total cost is for equipment installation and maintenance, 24 percent is for guards, 24 percent is for the SSO, 10 percent is for personnel and readiness (background checks, training, drills, audits and visitor escorts), 1 percent is for the Top-Screen process and 2 percent is for SVAs and SSPs. These summary costs are outlined in Tables 3 and 4.

Table 3. Three-year total costs by type (not discounted)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Capital Costs	$2,674	59%	$800	55%	$3,481	60%
Guards	473	11%	141	10%	617	11%
SVA/SSP Costs	114	3%	34	2%	148	3%
SSO	838	19%	252	17%	1,090	19%
Personnel and Readiness	245	5%	73	5%	318	5%
Top-Screen*	136	3%	136	9%	136	2%
Reclassified High Risk Facilities**	11	0.3%	11	0.8%	11	0.2%
SSP Hearings & Appeals	0.1	0.002%	0.1	0.005%	0.1	0.001%
TSDB Appeals	8	0.2%	2	0.2%	10	0.2%
Total	**$4,500**	**100%**	**$1,450**	**100%**	**$5,811**	**100%**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

Table 4. Ten-year total costs by type (not discounted)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Capital Costs	$4,821	38%	$1,443	37%	$6,274	38%
Guards	2,998	24%	894	23%	3,905	24%
SVA/SSP Costs	277	2%	83	2%	361	2%
SSO	2,972	24%	893	23%	3,865	24%
Personnel and Readiness	1,299	10%	390	10%	1,689	10%
Top-Screen*	179	1%	179	5%	179	1%
Reclassified High Risk Facilities**	11	0.1%	11	0.3%	11	0.1%
SSP Hearings & Appeals	0.1	0.001%	0.1	0.002%	0.1	0.000%
TSDB Appeals	15	0.1%	4	0.1%	19	0.1%
Total	**$12,572**	**100%**	**$3,898**	**100%**	**$16,303**	**100%**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

The reader is cautioned that we did not attempt to replicate precisely the regulatory language in this cost analysis of the IFR; the regulatory text, not the text of this regulatory assessment is legally binding.

Regulatory Assessment[3]

1. Interim Final Rule Description

This analysis presents the scope and magnitude of the range of costs that chemical sector facilities will incur for implementing and complying with the IFR titled "Chemical Facility Anti-Terrorism Standards (CFATS)" as authorized by Section 550 of the Department of Homeland Security Appropriations Act of 2007 (the Act).

The IFR requires certain chemical facility owners and/or operators to comply with risk-based performance standards that will reduce the likelihood of a successful terrorist attack against the facility. A performance standard defines the required level of performance, but allows the owner/operator to specify the measures required to achieve that outcome, subject to DHS review and approval of the Site Security Plan (SSP) and an on-site inspection.

The IFR requires chemical facilities fitting certain risk profiles to register to use a DHS-secured web-based system to complete a Chemical Security Assessment Tool (CSAT) consequence assessment screening methodology (called Top-Screen) to determine a preliminary tier level. If the facility meets certain consequence thresholds, it will be required to complete a Security Vulnerability Assessment (SVA) and DHS would determine a final facility tier level and require sites to complete a SSP. Following certain facilities' submission of the SVA and SSP, DHS would review the SVA and SSP for compliance with the risk-based performance standards outlined in the IFR. See Table 5 for the approximate phase-in schedule.

The requirement for a high-risk chemical facility that has been placed in Tier 1-4 (also known here as a "covered facility") to conduct a SVA and develop a SSP is expressly required by the first sentence of section 550 of the Act. A SVA is an evaluation of the consequences and vulnerabilities of a covered facility with respect to specific terrorist threat scenarios. The SVA also examines the aspects of the covered facility that pose the most significant vulnerabilities to terrorist attack. DHS will review each SVA, and may also scrutinize the SVA in the course of a facility inspection. In addition, a covered facility's SVA assists DHS in confirming that a facility has been assigned to the appropriate risk-based tier. A SVA will also provide the covered facility with information on vulnerabilities that should be addressed during the preparation of the SSP.

A SSP must address both the SVA for the covered facility and the applicable ''risk-based performance standards.'' To address the SVA, the plan must identify and describe the function of the measures the covered facility will employ to address each of the facility's vulnerable areas. Focusing on those vulnerable areas, the SSP must then address specific modes of potential terrorist attack and how each would be deterred or otherwise addressed. For example, a facility must select, develop and describe security measures intended to address potential attacks involving such

[3] For definition of acronyms throughout this analysis, refer to the list at the beginning of the report.

threats as: (1) A VBIED (vehicle-borne improvised explosive device); (2) a water-borne explosive device (if applicable); (3) an armed assault team; (4) theft of certain chemicals; and (5) the possibility of outsider, insider or cyber sabotage. In addition, a covered facility's SSP must identify how the layered security measures selected by the covered facility meet DHS's risk-based performance standards.

The types and robustness of measures necessary to satisfy the risk-based performance standards will depend on the risk-based tier of the facility at issue. High-risk facilities will also have a continuing obligation, as specified in the IFR, which will vary based on their risk-based tier, to maintain and periodically update their Top-Screen, SVA, and SSP.

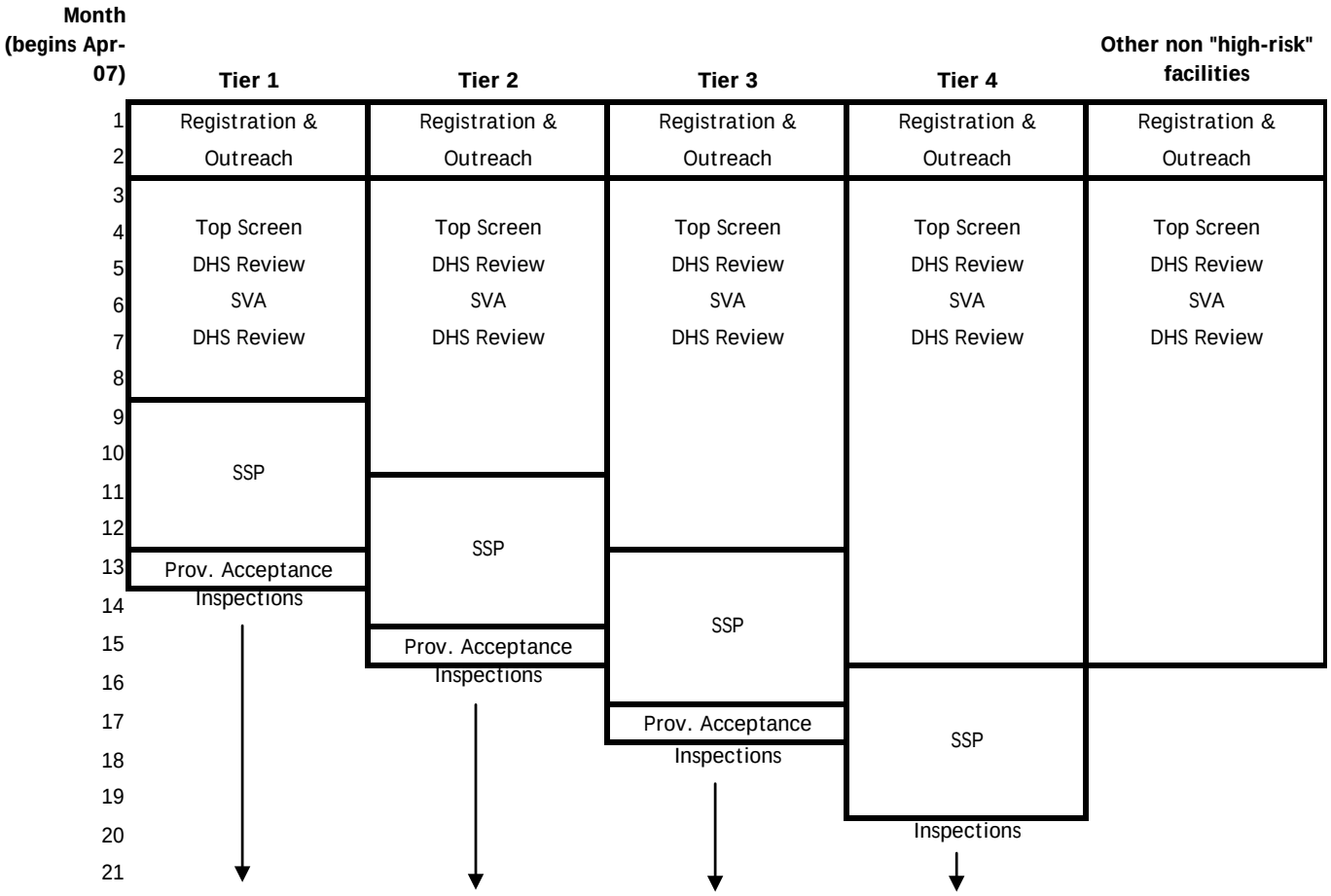
2. Period of analysis

The initial statutory authorization is for three years[4]. Consequently, DHS has presented the costs for the three year period beginning October 2006 through October 2009 as its primary estimate of the compliance costs of the IFR. For purposes of comparison, DHS has also presented a ten year (2006-2015) period of analysis over which to evaluate costs. The ten year estimate is commonly used in regulatory analyses and presenting the ten year cost will serve to further inform the reader.

Implementation will be phased in over three years, beginning in 2007. Facilities in each tier will incur costs on a staggered schedule. For the purpose of this analysis, the cost to facilities during 2007 will be limited to the cost of registration for the online CSAT tool and submitting the Top-Screen, except Tier 1 facilities which will complete their SVAs during 2007. All facilities that submit top-screen information at the earliest opportunity during 2007 are expected to submit their SSPs by the end of 2008 and will have begun to make capital improvements and install other non-capital security measures, i.e., security guards, training, etc. DHS assumes that initial capital costs will have been incurred by October 2009.

[4] Section 550 (b) of the Act states: "Interim regulations issued under this section shall apply until the effective date of interim or final regulations promulgated under other laws that establish requirements and standards referred to in subsection (a) and expressly supersede this section: *Provided,* That the authority provided by this section shall terminate three years after the date of enactment of this Act."

Table 5. Approximate Phase-in for DHS Implementation of IFR



* DHS estimates that a number of facilities (approximately 1,000) will be preliminarily determined to be high-risk after the completion of the Top-Screen, but after completion of the SVA, the designation will be changed and these facilities will be determined NOT to be high-risk.
**DHS system is not available to accept Top-Screen submissions before the effective date of the regulation.

3. Registration and Top-Screen

Over the next three years, DHS estimates that as many as 50,000 facilities will be initially screened through the online Chemical Security Assessment Tool (CSAT) Top-Screen to help determine if they are a high-risk facility for the purpose of the IFR. Each of the approximately 50,000 facilities will have to register with DHS to use the online tool and submit answers to the screening tool so that DHS can determine, on a preliminary basis, if they are a high-risk facility.

In order to arrive at our estimate of 50,000 facilities expected to perform a Top-Screen, facility data from the EPA Risk Management Program (RMP), SRI Consulting[5]

[5] Formerly known as Stanford Research Institute.

Directory of Chemical Producers, and the Homeland Security Infrastructure Program (HSIP), was used to identify approximately 40,000 facilities that might reasonably manufacture, process, use, store, or distribute a chemical (or chemicals). Although not known with certainty due to the lack of explicit chemical data, many of these facilities reasonably may have chemicals that DHS has identified as:

- toxic or flammable materials that may cause harm to human health if there were a loss of containment;
- a chemical weapon, Improvised Explosive Device (IED) chemical or precursor that could be stolen or obtained through diversionary tactics;
- a reactive chemical that could be tampered with and cause harm after leaving the facility.

In addition to these 40,000 facilities, it is expected that there will be an additional number of facilities that will complete a Top-Screen that are not listed among the 40,000. DHS does not have very much information on which to base an estimate for the additional number of facilities beyond the 40,000 facilities previously discussed; however, for the purpose of this analysis, DHS will assume an additional 10,000 facilities will undergo the Top-Screen process over the three year period of analysis. DHS recognizes that the majority of the 50,000 will complete the Top Screen and subsequently be determined to not be a high risk chemical facility.

Recognizing that facilities present varying security risks depending on the type and quantity of chemicals as well as the surrounding community, DHS will sort high-risk chemical facilities into one of four tiers. The information gathered through Top-Screen will be used to help support such preliminary tiering determinations[6].

For purposes of estimating the cost of registration and screening[7], DHS has segmented the facilities expected to complete a Top-Screen into the following broad categories:

1) Large open manufacturing-These facilities are large "open" facilities (not enclosed in a building) that are assumed to have multiple chemicals onsite. For the purpose of analysis, DHS defines "large" to be a facility with 100 or more full time equivalents (FTEs) (employees).

2) Merchant wholesalers (excluding farm supply wholesalers) and retailers-These facilities are expected to have many chemicals in their inventories to report in Top-Screen. Because merchant wholesalers do not vary in size to the same degree as chemical manufacturing facilities, this set of facilities is not segmented by employment size. These merchant wholesalers are often referred to as chemical distributors.

[6] The preliminary tiering decisions will be based on a number of factors, including information from the Top-Screen, intelligence information, and information from other appropriate sources. Final tiering determinations will consider information gathered and assessed during the SVA and onsite inspections.

[7] The reader should note that the 4 model populations used here to facilitate the cost estimate of the approximately 50,000 facilities filling out Top-Screen a is a different "model population" than the "model population" used later in the analysis to estimate the compliance costs of facilities found to be "high-risk."

3) Facilities with 1 or 2 chemicals-These are facilities that have only one or two chemicals onsite. Generally, these facilities include those that use anhydrous ammonia for commercial/industrial refrigeration, farm supply wholesalers that stock only one or two chemicals of concern, and facilities that likely have only chlorine and no other chemicals of concern on site (i.e., industrial launderers).

4) Other facilities-This group includes other "open" facilities with 99 or fewer FTEs, other manufacturers, and other industries which manufacture, process, store, use or distribute chemicals of concern.

Facilities completing the Top-Screen were placed into one of the 4 broad categories described above based on the NAICS code of the facility[8]. DHS identified the NAICS codes of facilities that would likely be large open facilities (manufacturing facilities not enclosed within a building), including chemical manufacturing (excluding pharmaceuticals), petroleum refining, oil and natural gas extraction, fuel dealers, and pipelines.[9] Based on NAICS codes, DHS identified a set of facilities for which only one or two chemicals covered by the IFR are likely to be onsite. DHS also identified a set of merchant wholesalers based on NAICS codes. The remaining facilities were included in the "other facilities" category. A comprehensive list of the NAICS codes that DHS considered is in Appendix C. DHS understands there are likely to be exceptions to these generalized estimates.

It is assumed that each facility that registers on the DHS website for access to Top-Screen and the CSAT SVA and SSP tools will need to rely on the expertise of various staff in order to answer the questions in the online screening tool. Appendix E details the assumptions made regarding the cost of the Top-Screen for each facility category. Table 6 provides a break out of the costs to facilities to register and complete a Top-Screen. Depending on the size and type, facilities would incur a cost between approximately $2,300 and $3,500. DHS assumes 40,000 facilities will complete the Top-Screen in 2007, 7,500 in 2008, and 2,500 per year thereafter. This also includes existing facilities that make material changes that could affect their facility's vulnerability or consequence profile and must notify DHS within a specified period of time. These facilities may need to complete and submit a new Top-Screen even if they are out of the regular cycle of review/update year. The total cost of the Top-Screen in the first year is estimated to be $110.0 million in 2007 undiscounted dollars. The cost for biennial and triennial updates to a facility's Top-Screen information is presented in Table 14.

[8] The list of 40,000 facilities (explained previously) contained the NAICS code for approximately 92% of the listed facilities. DHS used this information to make general assumptions regarding the 50,000 facilities DHS believes will complete the Top-Screen over the next three years.

[9] Facilities that were classified as involved in the administration of air and water resource and solid waste management programs were excluded entirely as they are not covered under this rule.

Table 6. Cost of Facility Registration and Top-Screen for New Entrants and Out-of-Cycle Facilities* (undiscounted 2007 dollars)

	Open Large	Merchant Wholesalers	Facilities with only 1-2 chemicals	Other	Total Facilities	Total Top-Screen Cost per year
2007	9,327	432	7,968	22,273	40,000	110,003,900
2008	1,749	81	1,494	4,176	7,500	20,625,900
2009	583	27	498	1,392	2,500	6,875,300
2010	583	27	498	1,392	2,500	6,875,300
2011	583	27	498	1,392	2,500	6,875,300
2012	583	27	498	1,392	2,500	6,875,300
2013	583	27	498	1,392	2,500	6,875,300
2014	583	27	498	1,392	2,500	6,875,300
2015	583	27	498	1,392	2,500	6,875,300
Cost per Facility	$3,500	$2,600	$2,300	$2,600	n/a	n/a
Hours per Facility	39.5	30	25.5	30	n/a	n/a

* A new entrant is a company that has not previously completed Top-Screen. An "out-of-cycle" facility has completed a Top-Screen, but has made a material change to their process(es) and must notify DHS regardless of where they are in the Top-Screen biennial or triennial update/review.

4. "High Risk" Population Estimates Used for Analysis

This section describes how DHS developed population estimates for the purpose of estimating cost to the high-risk facilities. The numbers presented here are estimates and may have been rounded to facilitate the analysis.

The risk-based performance standards implemented by this IFR will apply to chemical facilities determined by the Secretary (based in part on the results of the Top-Screen process) to present a high risk.

According to the statutory exemptions, the regulations issued under Section 550 will not apply to public water systems (as defined by section 1401 of the Safe Drinking Water Act); water treatment works facilities (as defined by section 212 of the Federal Water Pollution Control Act); any facilities owned or operated by the Departments of Defense and Energy; and facilities subject to regulation by the Nuclear Regulatory Commission. The regulations promulgated under Section 550 also will not apply to maritime facilities regulated by the Coast Guard pursuant to the Maritime Transportation Security Act (MTSA) of 2002.

After completion of the Top-Screen, facilities that are determined (on a preliminary basis) to be high-risk will be assigned a preliminary tier. These facilities will be asked to conduct a SVA based on their preliminary tier. DHS estimates that approximately 2,500 to 7,500 facilities will conduct a SVA. Because the SVA will yield additional information not available from the Top-Screen, some facilities may move to a lower

(or higher) tier or DHS may determine that they are not a high-risk facility and thus are not subject to the regulation.

Following the SVA process, DHS estimates that between 1,500 and 6,500 high-risk facilities will fall within the four tiers subject to regulation. This estimate is based on available data and DHS' understanding of the chemical sector. The results of the Top-Screen and SVA processes will help inform the determination of the number of facilities in Tiers 1-4. For the purpose of conducting this cost analysis, DHS has made broad assumptions about the number of facilities that could be expected to be in each tier. Table 7, below, presents the estimated distribution of high-risk facilities by tier.

Over the course of time, facilities may make changes to their process, their equipment or the amount of chemicals that they store on site that may reduce their vulnerability and, thus there may be migration of facilities within the tiers. At this time, DHS does not have enough data to make assumptions about changes in the long-term population of facilities within tiers. For the purpose of this analysis, DHS assumes the facility population remains constant through the analysis period.

Table 7. Percentage Estimate of the "High Risk" Facility Population by Tier

	% of total (Range)	% of total (mid-point)
Tier 1	3-5%	4%
Tier 2	9-11%	10%
Tier 3	34-38%	36%
Tier 4	48-52%	50%
Total		100.0%

DHS estimates that between 1,500 and 6,500 chemical facilities will be considered to be high-risk and will implement the risk-based performance standards required by this IFR. Tiers are made up of facilities from multiple population types. Below is a description of the facilities by population type:

1) Loss of Containment, Damage or Injury: DHS's best estimate is that between 1,000 and 4,000 facilities in this population group will meet the requirements of one of the four high risk tiers based on the potential for significant numbers of fatalities or serious injuries from a catastrophic release or loss of containment of toxic, flammable, or explosive chemicals. These chemical facilities are the ones assumed to be most at risk of an attack that would be meant to cause the deliberate loss of containment at the facility. Such an attack would result in adverse consequences for human life and health both onsite as well as offsite. DHS's population estimate was informed by EPA's Risk Management Program (40 CFR Part 68). As discussed in the December 28, 2006 Advance Notice, EPA's Risk Management Program requires certain chemical facilities with listed chemicals in amounts exceeding prescribed threshold quantities to register, prepare an offsite consequence analysis, develop an emergency response program, prepare a five-year accident history, submit to EPA a risk management plan (RMP) and to implement the accidental release prevention program (*see* 42 U.S.C.7412(r)). These requirements are intended to prevent accidental releases and minimize the consequences of such releases by focusing on chemicals that in the event of an accidental release, could reasonably be expected to cause death, injury, or serious adverse effects to human health and the environment. As of 2004, approximately 14,500 U.S. stationary sources (i.e., facilities) were covered under the RMP rule.

2) Theft and diversion/sabotage and contamination: DHS's best estimate is that between 500 and 2,500 facilities manufacture, process, use, store or distribute chemicals that could be the targets of theft and diversion. The RMP data described above do not provide information relating to chemicals at other potentially high-risk facilities, which could be stolen, diverted or tampered with to create an impact at an offsite location. This group includes facilities such as certain facilities covered by the Chemical Weapons Convention (CWC) or other facilities that manufacture, process, use, store or distribute chemicals that could be used to make a chemical weapon, improvised explosive device, weapon of mass effect or other explosive or toxic device. Also included in this category are facilities that manufacture, process, use,

store or distribute reactive chemicals. These reactive chemicals can spontaneously ignite, form a toxic vapor cloud or cause an exothermic reaction if they come into contact with water or other reactants for the purpose of sabotage.

3) National Economic Critical and Government Mission-Critical: These are facilities that produce mission-critical or economically-critical chemicals and supply those chemicals to government mission-critical sectors (i.e., defense industrial base), infrastructure (i.e., electric generators, public water supply) and/or economically critical assets (i.e., agriculture, refining, etc.). DHS's best estimate is that there are between 10 and 100 facilities that are mission- or economically-critical and that most of these facilities are included in the loss of containment population discussed above. For purposes of analysis, DHS has included them in the loss of containment population because the security measures these facilities would undertake to prevent terrorist attack could be very similar to the security measures undertaken by facilities for which loss of containment is the primary threat.

5. Cost Estimation Methodology

Section 550 of the Department of Homeland Security (DHS) Appropriations Act of 2007 requires the Secretary of Homeland Security to promulgate ''interim final regulations establishing risk-based performance standards for security of chemical facilities * * *.'' He must do so ''[n]o later than six months'' from the date of enactment of this new authority, *i.e.* by April 4, 2007. Consequently, the methodology chosen to analyze the cost of this interim final rule was chosen with the six month Congressional deadline in mind. In order to quickly analyze the cost of the interim final rule, DHS relied on readily available information and drew upon the knowledge of professionals employed by DHS who have extensive knowledge of the chemical industry. In addition, on December 28, 2006 DHS published an advance notice of rulemaking which outlined our costing methodology and we also placed in the docket our estimates of capital costs for potential security investments in order to seek meaningful public comment.

DHS has reviewed the methodology used by the U.S. Coast Guard to analyze the cost of the MTSA Facility Security final rule at 68 FR 60,515 (Oct. 22, 2003), and, due to the similarities between the MTSA Facility final rule and this interim final rule, DHS believes that this methodology has merit should be used in this rulemaking. The MTSA Facility Security final rule estimated the cost of performance standards on several thousand unique facilities. Similarly, DHS estimates the costs of risk-based performance standards for several thousand unique facilities. The Coast Guard found it impractical to attempt to estimate compliance costs for each individual facility and instead developed costs based on 16 "model facilities." Each of the several thousand facilities was placed into one of the 16 different subgroups for which compliance costs were then estimated. Once the compliance costs for the 16 "model facilities" were calculated, estimating the cost of the regulation was relatively straightforward.

For the cost assessment that accompanies this IFR, DHS has estimated compliance costs based on the ''model facility'' concept similar to the one used by the USCG

discussed above. DHS has previously estimated that there will be between 2,500 to 7,500 facilities that will be expected to complete a SVA[10] and between 1,500 to 6,500 facilities required to implement the risk-based performance measures required by the IFR. These 1,500 to 6,500 facilities have been placed one of the 16 "model facilities" categories explained below in order to facilitate the calculation of the costs of the IFR on owners and/or operators.

As this regulation is not a "command and control" regulation, owners and/or operators will have considerable flexibility in how they choose to comply with its requirements. As owners and/or operators will have discretion on how to best meet the risk-based performance objectives, the cost assessment makes broad assumptions regarding the percentage of facilities that will choose to implement or continue certain security measures and the costs of those security measures. For example, many facility owners and/or operators will choose such measures as building fences, enhancing perimeter lighting, and hiring additional security guards in order to comply with the risk-based performance standards. In order to estimate the cost of the interim final regulation, DHS made broad assumptions regarding the specific percentage of facilities that will choose to implement certain security measures, such as fences and perimeter lighting.

In addition, chemical facility owners and/or operators will likely conduct facility-specific and company-specific analyses to determine the most cost-effective method to comply with the requirements of this interim final regulation. As a result of these internal analyses, facilities are likely to identify various means of meeting the risk-based performance standards applicable to their facility and tier. It is possible that some percentage of facilities will find the most-cost effective method to comply with the requirements will be to implement business and related production, processing or equipment changes such as to no longer make certain chemicals or to change their process to use a less concentrated or less hazardous form of a listed chemical. Such process changes, however, are very facility-, business- and process-specific. Those that involve changes in chemistry or processes may take several years of design, testing and re-permitting before they can become operational. Others may be easily and immediately implemented. However, because process changes are so facility- and business-specific, DHS has no way of estimating how many facilities may ultimately implement such measures for the purpose of estimating compliance costs. Consequently, DHS is basing its estimate of compliance costs on commonly used security measures that are broadly applicable to a wide range of high risk chemical facilities, such as the purchase of fences, perimeter lighting, and security guards.

For the purposes of good practices or regulations promulgated by other Federal or State agencies, many chemical facility owners and/or operators have already spent a substantial amount of money and resources to upgrade and improve security. The costs shown below do not include the costs of security measures already implemented

[10] Recall that DHS estimated that a number of facilities (approximately 1,000) will be preliminarily determined to be high-risk after the completion of the Top-Screen, but after completion of the SVA, the designation will be changed and these facilities will be determined NOT to be high-risk.

to enhance security. The costs shown here are intended to represent the marginal cost incurred by owner and/or operators as a result of the interim final rule.

5.1 Model Facility Categories

In order to approximate compliance costs for the estimated 2,500 to 7,500 facilities that will be expected to complete a SVA and the 1,500 to 6,500 high-risk chemical facilities that will be expected to develop a SSP, and implement layered security measures, the "model facility" concept that is being used for this IFR considers:

1) Which of the four risk-based tiers a covered facility is assigned;
2) Whether the covered facility is "enclosed" (inside a building) or "open" (not inside a building);
3) The size of a covered facility (large or small)[11]; and
4) Whether the chemicals at a facility are at risk of theft and diversion for subsequent use as a weapon or a component of a weapon.

DHS has chosen 16 types of model facilities on which to base compliance costs of the IFR based on the above four criteria.

Because the types and robustness of measures necessary to satisfy the risk-based performance standards will depend on the risk-based tier of the covered facility at issue, DHS has created model facilities that describe each of the four risk-based tiers to account for the expected different compliance costs among the tiers. For example, a Tier 1 facility would most likely require a greater investment for security enhancements than a Tier 4 facility. As a result, capital costs are likely to be higher for a Tier 1 facility than a Tier 4 facility, all things being equal. For example, a Tier 1 facility may install a secure perimeter that could withstand a vehicle attempt to penetrate, a fence line intrusion detection system, or hire armed guards among other security measures. A Tier 4 facility may not implement these types of security measures as its vulnerabilities and attractiveness would be lower and it may not be required to provide such extensive security measures to meet the risk based performance standard.

In addition to the four population types developed to estimate Top-Screen costs and described in section 4 above, DHS has created model facilities to describe whether the facility is an open facility or enclosed in a building. These two types of facilities are very different and may require a different set of security measures. First, an "open facility" has processes that are more likely to include toxic inhalation hazards located outdoors which may be an attractive target for an adversary seeking to harm the community. Second, if a facility is considered an open facility it likely has a larger perimeter which requires a higher level of monitoring and an open facility may also choose to install a vehicle screening area and shipment receiving area where vehicles may be screened before entering. Such a facility would implement a

[11] In the context of developing model facilities to facilitate the estimation of the IFR costs, the term "large or small" as it is used here, should not be confused with the Small Business Administration's definitions of what constitutes a small business.

different suite of security measures to comply with the risk-based performance standards of the IFR than an enclosed facility which is entirely enclosed within a building and has fewer points of entry (doors) that are more easily monitored and secured.

To facilitate the development of the cost estimate of the IFR, DHS created four categories of facilities: three categories of facilities where loss of containment is the primary concern and one set of facilities where theft and diversion of chemicals is the primary concern.

5.1.2 Loss of Containment[12]

- *Group A* includes open facilities with 100 or more employees[13] where loss of containment is the primary concern. These facilities are assumed to have 5 security entrances for the purpose of the cost analysis.

- *Group B* includes open facilities with 99 or fewer employees where loss of containment is the primary concern. In addition, facilities that store anhydrous ammonia for commercial refrigeration in outdoor vessels are also considered "open" for the purpose of this analysis because it is the outdoor storage that requires protection. These facilities are assumed to have 2 security entrances for the purpose of the cost analysis.

- *Group C* facilities are enclosed facilities where loss of containment is the primary concern (i.e., warehouses, enclosed manufacturing sites) that manufacture, process, use, store and/or distribute chemicals. DHS did not segment enclosed facilities by size because the same degree of variation between a large open facility (i.e., 2,000-acre petrochemical complex) and a small open 3-5-acre facility does not exist. These facilities are assumed to have 1 security entrance for the purpose of the cost analysis.

Facilities in groups A, B, and C are at primary risk for loss of containment, damage or injury. To segment this population on the basis of whether the facility is open or enclosed, DHS used the EPA RMP data for facilities that may be assigned to Tiers 1-4 and identified NAICS codes which would likely describe an open facility, including chemical manufacturing (excluding pharmaceuticals), petroleum refining, oil and natural gas extraction, fuel dealers, pipelines, liquefied petroleum gas dealers. Facilities that were classified as involved in the administration of air and water

[12] Because the security measures to protect a mission-critical/economically-critical facility and a loss of containment facility are similar, DHS has included these facilities with those at risk for loss of containment. DHS assumes that 80%, 10% and 10% of mission-critical/economically critical facilities will be in Groups B, A, and C, respectively.

[13] In the December 28, 2006 Advance Notice of Rulemaking, DHS asked if a facility "with six or more chemical processes" should be used to define a facility as "larger" for the purpose of the cost analysis. Due to a lack of specific information on the number of processes at chemical facilities, DHS has adjusted its approach to make the number of employees at the facilities the delineating factor of facility size (i.e. whether a facility should be considered to be "larger" for the cost analysis). DHS understands there are specific exceptions to this broad assumption.

resource and solid waste management programs were excluded entirely, as they are not covered under this rule. The remaining facilities were assumed to be enclosed within a structure. The "enclosed" facilities are not segmented by size.

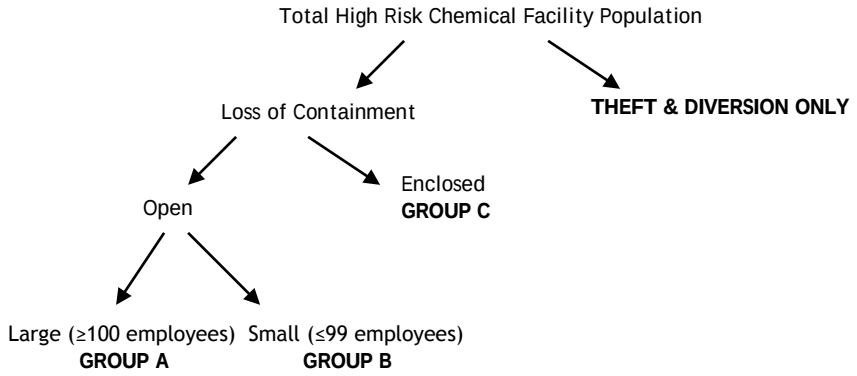
Next, DHS further segmented the estimated open population into "large" Group A facilities and "small" Group B facilities. DHS has assumed, for the purpose of this analysis, that a "small" facility has 99 or fewer employees and a "large" facility has 100 or more employees. Using data on FTEs from the RMP database, DHS divided the open population into facilities with 100 or more FTEs and those with 99 or fewer FTEs. For each tier, DHS divided the number of facilities in each model facility category by the total number of facilities in that tier to calculate a set of distribution percentages. DHS then applied those percentages to the population estimates by tier to estimate the number of facilities in each tier for Groups A, B, and C. For more information about how the population was divided, refer to Appendix D.

5.1.3 Theft and Diversion

In addition to facilities primarily at risk for loss of containment, there are other facilities likely to be determined to be high risk. DHS created a set of model facilities for which theft and diversion of chemicals is the primary concern. Many of these facilities are merchant wholesalers (often called chemical distributors) or warehouses, but also include facilities that may use these chemicals as part of their manufacturing or other process. These facilities could be merchant wholesalers, chemical manufacturers, or other manufacturers that manufacture, process, use, store or distribute chemicals that could be the target of theft and diversion. Theft of chemicals could include theft of portable containers by employees, visitors or adversaries. Diversion of chemicals that could later be used to harm humans involves what often looks like a legitimate transaction where an adversary, impersonating a legitimate customer, purchases chemicals that could later be converted into weapons. In the case of reactive chemicals, an adversary could intentionally engineer conditions under which a harmful chemical reaction could occur after a chemical shipment leaves the facility in a bulk transportation container or other shipment method. Because these facilities are not at as much risk of damage or injury due to loss of containment, their suite of security measures will likely differ from those facilities where loss of containment is the primary concern. For example, these facilities might not install a perimeter vehicle barrier or build an area outside the perimeter for receiving shipments like a large open facility might choose to do. The set of theft and diversion facilities consists of both open and closed facilities. For the purpose of this analysis, DHS assumes that 20% of these theft and diversion facilities will be open and may choose to install fencing and other related security measures. We considered breaking these facilities into Groups A, B, and C (as was done for the Loss of Containment facilities), but the suite of security measures specific to theft and diversion is very similar for all sizes of facilities. For example, locked storage, training to prevent theft, diversion, and tampering, and material control and accountability practices do not vary significantly based on size. As with the Group C facilities described above, there will be some degree of variation within the theft and diversion population. However DHS does not believe that these small variations

warrant the creation of more model facilities. On average, this analysis assumes these facilities employ about 35 workers. This average number of employees at theft and diversion facilities was estimated using the Census US Statistics of Business data by dividing the total employment by the total number of establishments for a selected set of NAICS codes[14].

In addition, DHS assumes that approximately 30% of the 1,000 to 4,000 facilities at primary risk due to loss of containment may also be at risk of theft and diversion. These facilities are categorized as loss of containment because it is their primary risk, and the suite of security measures for these facilities reflects the loss of containment risk. However, these facilities will incur add-on costs for anti-theft and diversion security measures.



In total, DHS is using the following 16 model facilities:

Group A - Open facilities with 100 or more employees where loss of containment is the primary concern.

- Tier 1
- Tier 2
- Tier 3
- Tier 4

14 NAICS codes used to estimate the average employment at theft and diversion facilities include: 115112 (soil preparation, planting, and cultivation), 2122 (metal ore mining), 3251 (basic chemical manufacturing), 3252 (resin, synthetic rubber and artificial fiber manufacturing), 32531 (fertilizer manufacturing), 32532 (pesticide and other agricultural chemical manufacturing), 32552 (adhesive manufacturing), 32592 (explosives manufacturing), 3312 (steel product manufacturing), 3313 (alumina and aluminum production and processing), 3314 (nonferrous metal (except aluminum) production and processing, 3315 (foundries), 3344 (semiconductor and other electronic component manufacturing), 4245 (farm product raw material merchant wholesalers), 42469 (other chemical and allied product wholesalers), and 42491 (farm supplies merchant wholesalers).

Group B - Open facilities with 99 or fewer employees where loss of containment is the primary concern and facilities that use anhydrous ammonia for refrigeration.

Tier 1
Tier 2
Tier 3
Tier 4

Group C - Enclosed facilities where loss of containment is the primary concern (i.e., warehouses, enclosed manufacturing sites).

Tier 1
Tier 2
Tier 3
Tier 4

Theft and Diversion – A facility for which theft and diversion of chemicals is the primary concern.

Tier 1
Tier 2
Tier 3
Tier 4

6. Unit cost assumptions

Because section 550 of the Act has established risk-based performance standards for security, not all facilities within each category will install each piece of equipment or implement the same security measures. The ANR defined risk-based performance standards as "requirements in terms of required results with criteria for verifying compliance but without stating the methods for achieving required results." By the nature of this definition, it is expected that facilities will choose among several potential means of compliance. For the purposes of this analysis, DHS needed to make broad assumptions to analyze the cost of a suite of compliance requirements a typical facility in each category might choose to comply with the regulation.

6.1 Equipment

Companies will select security measures to meet the risk-based performance standards. The IFR provides risk-based performance standards and does not specify any particular suite of security measures. As a result, the security measures identified below are only illustrative of the kinds of equipment a typical facility might consider installing to comply with the risk-based performance standards. Costs of security measures reflect DHS' estimate of current prices. DHS estimates that the annual Operations and Maintenance (O&M) cost for equipment is 10% of the purchase price. The unit cost estimates for installing or upgrading equipment are presented in Table 8.

We anticipate variability in the prices for the equipment and services presented herein. Prices that one facility may encounter in a specific part of the country may vary significantly from the prices faced by another facility elsewhere. For example, in some service areas, utilities may install lighting for a lesser cost and the labor and materials for constructing a vehicle staging area for shipping and receiving may vary widely across the country. Table 8 presents our best estimates of these prices and allows us to capture an order of magnitude of the economic impacts of the IFR. Appendix A provides descriptions of these security measures. **Table 8 should not be interpreted to be an exhaustive list of potential security measures or that DHS expects all facilities will be purchasing each of the security measures listed.** DHS assumes that capital costs will be spread out over the period between finalizing the site security plan and October 2009.

Table 8. Estimated unit cost of capital expenditures

	Group A		Group B		Group C		Theft & Diversion		
	Initial	Annual	Initial	Annual	Initial	Annual	Initial	Annual	Average Lifespan
Primary fence	$750,000	$75,000	$500,000	$50,000	$500,000	$50,000	$500,000	$50,000	10
Secondary fence	750,000	75,000	500,000	50,000	n/a	n/a	500,000	50,000	10
Guard house/Entry point	300,000	30,000	45,000	4,500	n/a	n/a	45,000	4,500	20
Receiving/Shipping area outside perimeter	85,000	8,500	30,000	3,000	n/a	n/a	n/a	n/a	30
Security control center	50,000	5,000	50,000	5,000	50,000	5,000	50,000	5,000	15
Staging area for vehicle screening	2,000	200	2,000	200	n/a	n/a	2,000	200	10
Active barriers at gate	85,000	8,500	85,000	8,500	85,000	8,500	85,000	8,500	10
Perimeter vehicle barrier	30,000	3,000	6,000	600	n/a	n/a	n/a	n/a	10
Electronic access controls and gate	350,000	35,000	100,000	10,000	30,000	3,000	100,000	10,000	7
Jersey barriers within site	50,000	5,000	15,000	1,500	15,000	1,500	15,000	1,500	20
Lighting (asset/inside)	80,000	8,000	35,000	3,500	n/a	n/a	35,000	3,500	15
Lighting (perimeter)	800,000	80,000	250,000	25,000	80,000	8,000	250,000	25,000	15
CCTV system*	400,000	40,000	230,000	23,000	215,000	21,500	230,000	23,000	5
fence line intrusion detection system	600,000	60,000	300,000	30,000	200,000	20,000	300,000	30,000	10
Communications system*	400,000	40,000	300,000	30,000	300,000	30,000	300,000	30,000	7
Handheld radios*	100,000	10,000	15,000	1,500	5,000	500	15,000	1,500	5
Firewall	30,000	3,000	10,000	1,000	1,500	150	10,000	1,000	3
Locked fenced area for sensitive inventory	15,000	1,500	10,000	1,000	10,000	1,000	10,000	1,000	10
Design/Engineering (% of total capital costs)	7.5	n/a	7.5	n/a	7.5	n/a	7.5	n/a	n/a

* For tier 4 facilities, the unit cost for these items is 25% of unit costs for facilities in Tiers 1-3.

Because capital investments depreciate over time, DHS has assumed a different life span for each type of capital expenditure. For example, a firewall unit, which is generally a computer with pre-loaded firewall software designed to prevent individuals outside the network from gaining access to networks within the facility, will need to be replaced every three years. DHS also assumes the CCTV system and radios will be replaced after five years and the electronic access controls and communications system will be replaced after seven years. All other capital investments are assumed to have a lifespan of ten years or longer. The average lifespan for equipment is listed in Table 8.

6.2 Security guard services

While the IFR does not require that facilities have security guard services, it is assumed that a number of facilities will choose to employ or outsource these services as a means of complying with the risk-based performance standards. Rather than using the cost of employee guards and accounting for multiple shifts per day, for the purpose of this analysis, DHS has assumed that facilities will contract out guard services to third-party security service firms. DHS believes this assumption most accurately captures the cost of guard services as it is a very common way for facilities to meet their general security requirements. Even if facilities decide to employ their guards as direct employees of the firm, since wages are such a large component of contract security the cost of providing security through direct employment should not be very different than providing security through a contract. As a result, the costs described herein are for the costs of a 24-hour full-time equivalent guard position, or 168 hours per week (HPW). The cost of security guard services is based on review of GSA schedule rates for guard services[15]. As with the cost of equipment, the cost of guard services varies depending on which part of the country the facility is located, and whether the guard carries a firearm. Training for guards is assumed to be provided by the guard services company and the cost of training is included in the hourly billing rate. We assume an hourly billing rate for guards will range from around $18/hour to around $30/hour, depending on the type of guards and their training. Thus, the cost to provide a 24/7 guarded position is assumed to range from $160,000 per year for an unarmed guard to $260,000 per year for an armed guard.

6.3 Personnel and Readiness (training, drilling, and planning costs)

6.3.1 Site Security Officers

DHS expects each facility will identify a Site Security Officer (SSO). Further, DHS recognizes that some of the SSOs may not be fully employed in performing the security duties required by the IFR; therefore, this analysis presents this collateral duty as a fraction of the time a full-time SSO will be engaged on average during a year to comply with new requirements imposed by this rule. Table 9 presents the assumptions for the percentage of time a SSO at each model facility type will spend complying with the risk-based performance standards of the IFR. While it may be possible for an individual SSO to have responsibilities for more than one site depending on size and proximity to one another, for the purpose of this analysis, DHS has assumed each facility will have its own SSO.

Potential responsibilities of the SSO may include the conducting and supervising the SVA and preparing the SSP, conducting annual internal audits, hosting DHS inspections, designing and documenting security training, maintaining required records, planning and documentation of security drills, and other activities associated

[15] http://www.alliedbarton.com/services/pdfs/pricelist.pdf
http://www.ares-group.com/pdf/GSA_Schedule_Contract_COMPLETE_V3.pdf

with the management of facility security per the IFR. For facilities where theft and diversion of chemicals is a concern, the SSO may also be responsible for ensuring material accountability and control. The cost and burden of complying with the Top-Screen requirement has already been discussed and considered in section 3 and is not considered in this section.

To fully account for the cost of the SVAs and SSPs, the time of the SSO is included in those costs. As a result, a series of adjustments have been made for each model facility during each year to adjust for the time the SSO spends on SVA and SSP activities. Table 9 presents these adjustments.

SSOs or key facility personnel will have annual training that will serve as either a refresher course or to address potential employee turnover within a facility. We also assume that the loaded labor rate of a full-time employee providing SSO duties as part of his/her job description is $160,000 per year[16]. This "loaded" labor rate includes the costs of benefits and other related overhead costs[17]. This is the cost of the employee to the company, not the actual wages the employee receives. On an hourly basis, the cost of the SSO is about $80 per hour.

[16] In its Cost Assessment for the MTSA Final Rule (USCG-2003-14732) USCG assumed the cost of a facility security officer to be $150,000 per year. Given wage inflation, DHS has assumed an additional $10,000, bringing the annual cost (including benefits) of a site security officer (SSO) to $160,000 per year.
[17] Throughout this analysis, average direct wages are increased using an assumed average benefit multiplier of 1.4 to create a wage that reflected current industry benefits and administrative costs paid by owners and operators.

Table 9. Site Security Officer Costs

			Cost of SSO time on SVA and SSP activities**				
	% of FTE SSO*	SSO Cost (including 40% benefits)	New SVA	Review/Update Existing SVA	New SSP	Review/Update Existing SSP	DHS required revisions to SSP
Tier 1 Group A	100%	$160,000	$6,700	$5,000	$7,800	$2,000	$2,000
Tier 1 Group B	100%	160,000	6,400	4,800	7,800	2,000	2,000
Tier 1 Group C	75%	120,000	6,400	4,800	7,800	2,000	2,000
Tier 1 Theft	75%	120,000	6,400	4,800	7,800	2,000	2,000
Tier 2 Group A	100%	160,000	6,700	5,000	7,800	2,000	2,000
Tier 2 Group B	75%	120,000	6,400	4,800	7,800	2,000	2,000
Tier 2 Group C	75%	120,000	6,400	4,800	7,800	2,000	2,000
Tier 2 Theft	75%	120,000	6,400	4,800	7,800	2,000	2,000
Tier 3 Group A	75%	120,000	6,700	5,000	3,900	1,000	1,000
Tier 3 Group B	50%	80,000	6,400	4,800	3,900	1,000	1,000
Tier 3 Group C	25%	40,000	6,400	4,800	3,900	1,000	1,000
Tier 3 Theft	25%	40,000	6,400	4,800	3,900	1,000	1,000
Tier 4 Group A	50%	80,000	4,200	3,100	2,000	500	500
Tier 4 Group B	50%	80,000	2,900	2,200	2,000	500	500
Tier 4 Group C	25%	40,000	2,900	2,200	2,000	500	500
Tier 4 Theft	25%	40,000	2,900	2,200	2,000	500	500

*This is the percentage of time a SSO will spend complying with duties resulting from this IFR. For example, we assume a Tier 1 Group A facility will require 100% of a SSO's time to comply with the IFR.
** Depending on whether a facility has an existing SVA or SSP, the facility will either have to prepare a new SVA and/or SSP or review and update an existing one. The time to review and update an existing SVA or SSP is less than the time to prepare a new one.

DHS assumes that the SSO and alternate SSO (if appropriate) at Tier 1 and 2 facilities may undergo specialized training offsite periodically. Including course registration, travel, and per diem expenses, we estimate the annual expense for SSO training to be $4,000 for both individuals.

6.3.2 Security Vulnerability Assessments

As discussed previously, approximately 50,000 facilities will be screened via the Top-Screen, an online tool DHS will use to collect data and assess chemical facilities. Following the Top-Screen process, each facility that has been preliminarily designated a high-risk facility will be required to conduct a SVA. DHS believes between 2,500 and 7,500 facilities will conduct a SVA. The SVA may require the expertise of various technical staff including engineers, EHS professionals, lawyers, management, and others. Facilities will be required to update their SVAs regularly. Tier 1 and 2 facilities will update their SVA every other year and facilities in Tiers 3 and 4 will update every 3 years. The cost of the SSO's time to prepare the SVA is included in the cost of the SVA and subtracted from the SSO's cost presented above. DHS recognizes that many facilities have already invested the time to conducting a SVA for their facilities.

Therefore, DHS assumes the cost of reviewing and updating a SVA will be 75% of the time and cost of a new SVA. We believe 75% is a reasonable assumption, but we recognize there may be some level of variability in the amount of time needed for an individual facility to review and update an existing SVA. Table 10 presents the costs associated with conducting Security Vulnerability Assessments.

Table 10. Cost of Initial Security Vulnerability Analysis (SVA) (whether new or updated)

		New Security Vulnerability Assessment			Review/Update Existing Security Vulnerability Assessment			
	Number of Facilities	% of Facilities	Hours per Facility	Cost per Facility	% of Facilities	Hours per Facility	Cost per Facility	Total Cost
Tier 1 Group A	81	25%	297	$25,000	75%	223	$18,750	$1,645,310
Tier 1 Group B	89	75%	260	20,000	25%	195	15,000	1,668,750
Tier 1 Group C	24	75%	260	20,000	25%	195	15,000	450,000
Tier 1 Theft	6	75%	260	20,000	25%	195	15,000	112,500
Tier 2 Group A	166	25%	297	25,000	75%	223	18,750	3,371,880
Tier 2 Group B	64	75%	260	20,000	25%	195	15,000	1,200,000
Tier 2 Group C	80	75%	260	20,000	25%	195	15,000	1,500,000
Tier 2 Theft	189	75%	260	20,000	25%	195	15,000	3,543,750
Tier 3 Group A	315	25%	297	25,000	75%	223	18,750	6,398,440
Tier 3 Group B	438	75%	260	20,000	25%	195	15,000	8,212,500
Tier 3 Group C	329	75%	260	20,000	25%	195	15,000	6,168,750
Tier 3 Theft	718	75%	260	20,000	25%	195	15,000	13,462,500
Tier 4 Group A	242	25%	182	15,000	75%	137	11,250	2,949,380
Tier 4 Group B	690	75%	142	12,000	25%	107	9,000	7,762,500
Tier 4 Group C	599	75%	142	12,000	25%	107	9,000	6,738,750
Tier 4 Theft	970	75%	142	12,000	25%	107	9,000	10,912,500
Reclassified High Risk**	1,000	75%	142	12,000	25%	107	9,000	11,250,000
Total SVA	6,000	n/a	n/a	n/a	n/a	n/a	n/a	$87,347,510

* DHS does not have precise information regarding the number of facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
** These facilities will be required to conduct a SVA as the result of their Top-Screen. However, based on their SVA results, these facilities may no longer be considered to be high risk for the purposes of the IFR.

6.3.3 Site Security Plan

After completing the SVA, high risk facilities will be required to prepare a SSP that outlines the security measures the facility will implement to reduce its vulnerability. Development of the SSP may require the expertise of various technical staff which may include engineers, EHS professionals, management, in some cases, lawyers and others. The cost of the SSO's time to prepare the site security plan is included in the cost of the SSP and subtracted from the SSO's cost. DHS recognizes that many facilities have already invested the time to develop a SSP for their facilities. Therefore DHS assumes the cost of reviewing and updating a SSP will be 25% of the time and cost of a new SSP. DHS assumes that approximately 25% of SSPs submitted for DHS approval will be returned to the preparer for further revision. The cost of revising a previously submitted SSP to meet DHS requirements is assumed to be 25% of the time and cost of a new SSP.

Table 11. Cost of Site Security Plans (SSPs)

		New Site Security Plan			Review/Update Site Security Plan			Revisions to Site Security Plan to Meet DHS Requirements			Total Cost
	No. of Fac.*	% of Facilities	Hours per Facility	Cost per Facility	% of Facilities	Hours per Facility	Cost per Facility	% of Facilities	Hours per Facility	Cost per Facility	
Tier 1 Group A	81	25%	263	$20,000	75%	66	$5,000	25%	66	$5,000	$810,000
Tier 1 Group B	89	75%	263	20,000	25%	66	5,000	25%	66	5,000	1,557,500
Tier 1 Group C	24	75%	263	20,000	25%	66	5,000	25%	66	5,000	420,000
Tier 1 Theft	6	75%	263	20,000	25%	66	5,000	25%	66	5,000	105,000
Tier 2 Group A	166	25%	263	20,000	75%	66	5,000	25%	66	5,000	1,660,000
Tier 2 Group B	64	75%	263	20,000	25%	66	5,000	25%	66	5,000	1,120,000
Tier 2 Group C	80	75%	263	20,000	25%	66	5,000	25%	66	5,000	1,400,000
Tier 2 Theft	189	75%	263	20,000	25%	66	5,000	25%	66	5,000	3,307,500
Tier 3 Group A	315	25%	131	10,000	75%	33	2,500	25%	33	2,500	1,575,000
Tier 3 Group B	438	75%	131	10,000	25%	33	2,500	25%	33	2,500	3,832,500
Tier 3 Group C	329	75%	131	10,000	25%	33	2,500	25%	33	2,500	2,878,750
Tier 3 Theft	718	75%	131	10,000	25%	33	2,500	25%	33	2,500	6,282,500
Tier 4 Group A	242	25%	66	5,000	75%	16	1,250	25%	16	1,250	605,000
Tier 4 Group B	690	75%	66	5,000	25%	16	1,250	25%	16	1,250	3,018,750
Tier 4 Group C	599	75%	66	5,000	25%	16	1,250	25%	16	1,250	2,620,625
Tier 4 Theft	970	75%	66	5,000	25%	16	1,250	25%	16	1,250	4,243,750
Total SSP	5,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	$35,436,875

*DHS does not have precise information regarding the number of facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

6.3.4 Inspections

Following the submission of the SSP, and subsequent revision (if required by DHS), each facility will host a DHS inspection to inspect the installation of the security measures outlined in the approved SSP and to ensure compliance with the IFR. The cost and time associated with preparing for and hosting a DHS inspection is presented in Table12. The cost of facility personnel involved in DHS site inspections excludes the time of the site security officer which is accounted for elsewhere in this analysis. It is assumed that DHS will inspect the highest risk facilities first, but that ultimately all facilities are assumed be inspected. For the purpose of analysis, DHS assumes that Tier 1 and 2 facilities will be inspected during 2008 while Tier 3 and 4 facilities will be inspected during 2009.

Table 12. Cost to Regulated Facilities to Prepare for and Host Site Inspections

Facility Personnel Involved in DHS Site Inspections

	Number of Facilities*	% of Facilities	Hours per Facility**	Cost per Facility	Total Cost
Tier 1 Group A	81	100%	96	$7,900	$640,000
Tier 1 Group B	89	100%	60	5,000	445,000
Tier 1 Group C	24	100%	60	5,000	120,000
Tier 1 Theft	6	100%	60	5,000	30,000
Tier 2 Group A	166	100%	96	7,900	1,311,000
Tier 2 Group B	64	100%	60	5,000	320,000
Tier 2 Group C	80	100%	60	5,000	400,000
Tier 2 Theft	189	100%	60	5,000	945,000
Tier 3 Group A	315	100%	76	6,300	1,985,000
Tier 3 Group B	438	100%	40	3,300	1,445,000
Tier 3 Group C	329	100%	40	3,300	1,086,000
Tier 3 Theft	718	100%	40	3,300	2,369,000
Tier 4 Group A	242	100%	56	4,600	1,113,000
Tier 4 Group B	690	100%	20	1,700	1,173,000
Tier 4 Group C	599	100%	20	1,700	1,018,000
Tier 4 Theft	970	100%	20	1,700	1,649,000
Total Inspections	5,000	n/a	n/a	n/a	$16,049,000

* DHS does not have precise information regarding the number of facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
** excludes the time of the SSO which is accounted for elsewhere

6.3.5 Audits

Each facility will be required to conduct annual internal audits of its compliance with the site security plan. The cost of conducting annual internal audits includes the cost of the time for various technical, EHS, corporate security officer, senior management, and clerical staff. The cost of the time of the SSO to conduct internal audits is already accounted for in the cost of the SSO and is not included here. Table 13 outlines the cost of conducting annual internal audits.

Table 13. Cost of Annual Internal Audits of Site Security Plan

	Annual Internal Audits of Site Security				
	Number of Facilities*	% of Facilities	Hours per Facility**	Cost per Facility	Total Cost
Tier 1 Group A	81	95%	96	$7,900	$608,000
Tier 1 Group B	89	95%	60	5,000	423,000
Tier 1 Group C	24	95%	60	5,000	114,000
Tier 1 Theft	6	95%	60	5,000	29,000
Tier 2 Group A	166	95%	96	7,900	1,246,000
Tier 2 Group B	64	95%	60	5,000	304,000
Tier 2 Group C	80	95%	60	5,000	380,000
Tier 2 Theft	189	95%	60	5,000	898,000
Tier 3 Group A	315	95%	76	6,300	1,885,000
Tier 3 Group B	438	95%	40	3,300	1,373,000
Tier 3 Group C	329	95%	40	3,300	1,031,000
Tier 3 Theft	718	95%	40	3,300	2,251,000
Tier 4 Group A	242	95%	56	4,600	1,058,000
Tier 4 Group B	690	95%	20	1,700	1,114,000
Tier 4 Group C	599	95%	20	1,700	967,000
Tier 4 Theft	970	95%	20	1,700	1,567,000
Total Inspections	5,000	n/a	n/a	n/a	$15,248,000

* DHS does not have precise information regarding the number of facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
** excludes the time of the SSO which is accounted for elsewhere

6.3.6 Biennial and Triennial Review and Update of SVA/SSP

The IFR requires facilities in Tiers 1 and 2 to update their Top-Screen information, SVAs, SSPs every other year and facilities in Tiers 3 and 4 to update every three years. Table 14 presents the biennial and triennial hours and costs for updating SVAs and SSPs during the years for which updates are due.

Table 14. Cost of Biennial and Triennial Top-Screen, SVA and SSP Updates

			Security Vulnerability Assessment and Top-Screen				Site Security Plan			
	No. of facilities*	Freq.	Hrs. per facility	Total hours annually**	Cost per facility	Total annual cost**	Hours per facility	Total hours annually**	Cost per facility	Total annual cost**
Tier 1 Group A	81	2	223	18,000	$18,750	$1,518,750	66	5,100	$5,000	$405,000
Tier 1 Group B	89	2	195	17,400	15,000	1,335,000	66	5,600	5,000	445,000
Tier 1 Group C	24	2	195	4,700	15,000	360,000	66	1,500	5,000	120,000
Tier 1 Theft	6	2	195	1,200	15,000	90,000	66	400	5,000	30,000
Tier 2 Group A	166	2	223	37,000	18,750	3,112,500	66	10,400	5,000	830,000
Tier 2 Group B	64	2	195	12,500	15,000	960,000	66	4,000	5,000	320,000
Tier 2 Group C	80	2	195	15,600	15,000	1,200,000	66	5,000	5,000	400,000
Tier 2 Theft	189	2	195	36,900	15,000	2,835,000	66	11,900	5,000	945,000
Tier 3 Group A	315	3	223	70,200	18,750	5,906,250	33	9,900	2,500	787,500
Tier 3 Group B	438	3	195	85,400	15,000	6,570,000	33	13,800	2,500	1,095,000
Tier 3 Group C	329	3	195	64,200	15,000	4,935,000	33	10,400	2,500	822,500
Tier 3 Theft	718	3	195	140,000	15,000	10,770,000	33	22,600	2,500	1,795,000
Tier 4 Group A	242	3	137	33,000	11,250	2,722,500	16	3,800	1,250	302,500
Tier 4 Group B	690	3	107	73,800	9,000	6,210,000	16	10,900	1,250	862,500
Tier 4 Group C	599	3	107	64,100	9,000	5,391,000	16	9,400	1,250	748,750
Tier 4 Theft	970	3	107	103,800	9,000	8,730,000	16	15,300	1,250	1,212,500
Total	5,000	n/a	n/a	777,800	n/a	$62,646,000	n/a	140,000	n/a	$11,121,250

* DHS does not have precise information regarding the number of facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
**for years where SVA/SSP updates are required

6.3.7 Number of Employees/Contractors for Calculation of Personnel-Related Costs

All employees and resident contractors (individuals who regularly work at a site, but are not employed by the company itself) at a facility are included in a facility-wide security plan. For the purpose of this analysis, DHS estimated the number of full-time employees for Groups A, B, and C based on the RMP data described in the model facility discussion above[18]. The number of employees at facilities with a primary theft and diversion risk was estimated using Census Bureau data analyzing the NAICS codes from which DHS expects the theft and diversion facility population to be primarily drawn. In addition to employees, DHS recognizes that many chemical facility workers are contract workers and are not represented in these data. The extent to which a facility uses contract workers varies by industry, region and corporate culture. To reflect resident contractors, DHS has assumed that resident contractors account for an additional 30% of facility employment at Group A facilities, 20% at Group B facilities, and 10% at Group C and facilities where theft and diversion are a risk. DHS assumes that there will be fewer contract workers as a percentage of facility

[18] Using the RMP database described below in Appendix D, DHS calculated the average FTEs for each of the three loss of containment model facility types for the purpose of estimating costs of security measures that are priced on a per employee basis, i.e., training and background checks.

employees at merchant wholesalers and warehouses which are represented in Group C and facilities where theft and diversion are a primary risk. The cost of training, background checks and other costs that depend on the number of workers includes an estimate of contractors even if facilities do not directly bear those costs. Additionally, DHS assumes approximately 20% worker turnover annually. By multiplying the number of average employees and contract workers (including 20%) turnover for each model facility by the number of model facilities yields a total of 1,063,200 workers in a given year. Applying the same methodology to the 20% turnover yields 177,290 workers.

Table 15. Average Number of Employees and Contractors per Facility (including 20% turnover)

	Average number of FTEs per facility	Contractors as % FTEs	Contractors	20% turnover (for all workers)	Ave. Number of Employees and Resident Contractors (inc. 20% turnover)	Number of Facilities*	Total Number of Employees and Resident Contractors (inc. 20% turnover)	Total annual turnover for all workers (20%)
Tier 1 Group A	391	30%	117	102	610	81	49,410	8,262
Tier 1 Group B	35	20%	7	8	50	89	4,450	712
Tier 1 Group C	152	10%	15	33	200	24	4,800	792
Tier 1 Theft	35	10%	4	8	47	6	282	48
Tier 2 Group A	279	30%	84	73	436	166	72,376	12,118
Tier 2 Group B	34	20%	7	8	49	64	3,136	512
Tier 2 Group C	317	10%	32	70	419	80	33,520	5,600
Tier 2 Theft	35	10%	4	8	47	189	8,883	1,512
Tier 3 Group A	487	30%	146	127	760	315	239,400	40,005
Tier 3 Group B	47	20%	9	11	67	438	29,346	4,818
Tier 3 Group C	310	10%	31	68	409	329	134,561	22,372
Tier 3 Theft	35	10%	4	8	47	718	33,746	5,744
Tier 4 Group A	283	30%	85	74	442	242	106,964	17,908
Tier 4 Group B	139	20%	28	33	200	690	138,000	22,770
Tier 4 Group C	201	10%	20	44	265	599	158,735	26,356
Tier 4 Theft	35	10%	4	8	47	970	45,590	7,760
Total	n/a	n/a	n/a	n/a	n/a	5,000	1,063,200	177,290

* DHS does not have precise information regarding the number of employees and contractors in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

6.3.8 Training

DHS assumes that facilities will provide training in security procedures to new and existing employees and resident contractors as part of orientation/annual EHS training. Therefore, we assume that security awareness training for employees and resident contractors will be incremental and will be on average 30 minutes per employee per year. At the 90th percentile, the average employee in NAICS 3251 (Basic Chemical Manufacturing) earns $40 per hour multiplied by a benefits multiplier of 1.4 yields an hourly rate of $56 per hour. Thus, the cost of 30 minutes of training is assumed to cost $28 per employee and contractor. Annual turnover of 20% is factored

into the cost of training. The cost of training for the SSO is discussed in the section on SSO costs above.

For facilities where theft and diversion are a risk, all employees and resident contractors will undergo specialized training to prevent theft and diversion of chemicals. DHS has assumed that facilities will provide this training as part of new employee orientation/annual EHS training. Therefore, we assume that anti-theft training for employees will be incremental and will be on average 30 minutes per employee per year. At the 90th percentile, the average employee in NAICS 3251 (Basic Chemical Manufacturing) earns $40 per hour multiplied by a benefits multiplier of 1.4 yields an hourly rate of $56 per hour. Thus, the cost of 30 minutes of training is assumed to cost $28 per employee and contractor. Annual turnover of 20% is factored into the cost of training, including during the first year.

Table 16. Security Training Costs

		Security Training				
	Avg. Number of Employees and Resident Contractors (inc. 20% turnover)	Number of facilities*	% of facilities	Cost per worker	Cost per facility	Total annual cost
Tier 1 Group A	610	81	25%	$28	$17,100	$346,275
Tier 1 Group B	50	89	75%	28	1,400	93,450
Tier 1 Group C	200	24	75%	28	5,600	100,800
Tier 1 Theft	47	6	75%	28	1,300	5,850
Tier 2 Group A	436	166	25%	28	12,200	506,300
Tier 2 Group B	49	64	75%	28	1,400	67,200
Tier 2 Group C	419	80	75%	28	11,700	702,000
Tier 2 Theft	47	189	75%	28	1,300	184,275
Tier 3 Group A	760	315	75%	28	21,300	5,032,125
Tier 3 Group B	67	438	75%	28	2,000	657,000
Tier 3 Group C	409	329	75%	28	11,500	2,837,625
Tier 3 Theft	47	718	75%	28	1,300	700,050
Tier 4 Group A	442	242	75%	28	12,400	2,250,600
Tier 4 Group B	200	690	75%	28	5,700	2,949,750
Tier 4 Group C	265	599	75%	28	7,400	3,324,450
Tier 4 Theft	47	970	75%	28	1,300	945,750
Total	n/a	5,000	n/a	n/a	n/a	$20,703,500

* DHS does not have precise information regarding the number of employees, contractors or facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

Table 17. Anti-theft Training Costs

	Avg. Number of Employees and Resident Contractors (inc. 20% turnover)	Number of theft & diversion facilities*	Number of theft add-on facilities*, **	% of facilities	Cost per worker	Cost per facility	Total annual cost
Tier 1 Group A	610		24	50%	$28	$17,100	$205,200
Tier 1 Group B	50		27	50%	28	1,400	18,900
Tier 1 Group C	200		7	50%	28	5,600	19,600
Tier 1 Theft	47	6		50%	28	1,300	3,900
Tier 2 Group A	436		50	50%	28	12,200	305,000
Tier 2 Group B	49		19	50%	28	1,400	13,300
Tier 2 Group C	419		24	50%	28	11,700	140,400
Tier 2 Theft	47	189		50%	28	1,300	122,850
Tier 3 Group A	760		95	75%	28	21,300	1,517,625
Tier 3 Group B	67		131	75%	28	2,000	196,500
Tier 3 Group C	409		99	75%	28	11,500	853,875
Tier 3 Theft	47	718		75%	28	1,300	700,050
Tier 4 Group A	442		73	75%	28	12,400	678,900
Tier 4 Group B	200		207	75%	28	5,700	884,925
Tier 4 Group C	265		180	75%	28	7,400	999,000
Tier 4 Theft	47	970		75%	28	1,300	945,750
Total	n/a	1,883	936	n/a	n/a	n/a	$7,605,775

* DHS does not have precise information regarding the number of employees, contractors or facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
** DHS assumes that 30% of the loss of containment facilities will have additional theft & diversion risk.

6.3.9 Drills

It is assumed that facilities will conduct periodic drills to ensure readiness. For the purpose of this analysis, it is assumed that facilities conduct one such drill per year. Further, we assume that the security component of the drill will be an extension of an existing EHS and emergency response drill. We assume that drills will require about 2 hours per facility and that Group A facilities will use 20 people per drill, Group B facilities will use 5 people. The cost per facility is based on the average hourly wage of $56.00 for all workers in NAICS 3251 (Basic Chemical Manufacturing) at the 90th percentile and including 40% for benefits. The cost to conduct drills excludes the cost of the SSO's time to plan, conduct, critique and document the drills, as his/her time is accounted for above. Table 18 presents the cost assumptions for annual drills for facilities.

Table 18. Cost of Annual Security Drills

	Number of Facilities*	% of Facilities	Hours per Facility**	Average hourly wage per worker (including 40% benefits)	Cost per Facility	Total Cost
Tier 1 Group A	81	95%	40	$56	$2,240	$172,400
Tier 1 Group B	89	95%	10	56	560	47,300
Tier 1 Group C	24	95%	10	56	560	12,800
Tier 1 Theft	6	95%	10	56	560	3,200
Tier 2 Group A	166	95%	40	56	2,240	353,200
Tier 2 Group B	64	95%	10	56	560	34,000
Tier 2 Group C	80	95%	10	56	560	42,600
Tier 2 Theft	189	95%	10	56	560	100,500
Tier 3 Group A	315	95%	40	56	2,240	670,300
Tier 3 Group B	438	95%	10	56	560	233,000
Tier 3 Group C	329	95%	10	56	560	175,000
Tier 3 Theft	718	95%	10	56	560	382,000
Tier 4 Group A	242	95%	40	56	2,240	515,000
Tier 4 Group B	690	95%	10	56	560	367,100
Tier 4 Group C	599	95%	10	56	560	318,700
Tier 4 Theft	970	95%	10	56	560	516,000
Total Drills	5,000	95%	n/a	n/a	n/a	$3,943,100

* DHS does not have precise information regarding the number of employees, contractors or facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
** excludes the time of the SSO which is accounted for elsewhere.

DHS also assumes facilities will interface with state and local first responders. This could involve providing an on-site tour for first responders to help them understand the unique characteristics presented by each facility. DHS does not anticipate any additional capital cost associated with this activity.

6.3.10 Personnel Surety

The IFR requires appropriate background checks for facility personnel with access to restricted areas or critical assets. DHS will consider appropriate open source background checks as an acceptable response to the background check performance standard. Specifically, the Department will consider as appropriate a background check process that verifies and validates identity; includes a criminal history check of publicly or commercially available databases; verifies and validates legal authorization to work through the I-9 process; and includes measures designed to identify people with terrorist ties. This last measure can only be achieved by checking against the consolidated Terrorist Screening Database (TSDB).

Much of the background check process can be accomplished by commercial methods, but the check of the Terrorist Screening Database is an inherently governmental

function that necessarily includes a check of classified databases that are not commercially available. The Department, therefore, will augment the background check done by the facility or on behalf of the facility with a TSDB check for the purpose of protecting critical assets and restricted areas of high risk chemical facilities from persons who pose a terrorist threat.

For the purpose of this analysis, it is assumed that each employee and resident contractor will undergo a background check, although this is likely a conservative assumption. Further, even though many facilities already conduct commercial background checks on their employees, DHS assumes that 100% of facilities will require a background check that includes a check against the TSDB. A background check is expected to cost on average $350 per investigation, including the facilities' associated administrative costs. In the private sector, effective criminal records screening can best be accomplished at the county level. This $350 estimate includes the cost of determining the correct counties to query, executing those queries, and paying any applicable fees to the counties. DHS has assumed a 20% employee turnover rate, thus the annual cost of performing background checks will be based on 20% of total employees and resident contractors.

Table 19. Personnel Surety Costs

				Initial			Annual		
	Number of facilities*	% of facilities	Avg. Number of Employees and Resident Contractors (inc. 20% turnover)	Cost per background check**	Cost per facility	Total initial cost	20% Turnover # Workers	Cost per facility	Total Annual Cost
Tier 1 Group A	81	100%	610	$350	$213,500	$17,293,500	102	$35,700	$2,891,700
Tier 1 Group B	89	100%	50	350	17,500	1,557,500	8	2,800	$249,200
Tier 1 Group C	24	100%	200	350	70,000	1,680,000	33	11,550	$277,200
Tier 1 Theft	6	100%	47	350	16,450	98,700	8	2,800	$16,800
Tier 2 Group A	166	100%	436	350	152,600	25,331,600	73	25,550	$4,241,300
Tier 2 Group B	64	100%	49	350	17,150	1,097,600	8	2,800	$179,200
Tier 2 Group C	80	100%	419	350	146,650	11,732,000	70	24,500	$1,960,000
Tier 2 Theft	189	100%	47	350	16,450	3,109,050	8	2,800	$529,200
Tier 3 Group A	315	100%	760	350	266,000	83,790,000	127	44,450	$14,001,750
Tier 3 Group B	438	100%	67	350	23,450	10,271,100	11	3,850	$1,686,300
Tier 3 Group C	329	100%	409	350	143,150	47,096,350	68	23,800	$7,830,200
Tier 3 Theft	718	100%	47	350	16,450	11,811,100	8	2,800	$2,010,400
Tier 4 Group A	242	100%	442	350	154,700	37,437,400	74	25,900	$6,267,800
Tier 4 Group B	690	100%	200	350	70,000	48,300,000	33	11,550	$7,969,500
Tier 4 Group C	599	100%	265	350	92,750	55,557,250	44	15,400	$9,224,600
Tier 4 Theft	970	100%	47	350	16,450	15,956,500	8	2,800	$2,716,000
Total	5,000	n/a	n/a	n/a	n/a	$372,119,650	n/a	n/a	$62,051,150

* DHS does not have precise information regarding the number of employees, contractors or facilities in each model facility population; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
**Some facilities may be able to negotiate lower rates due to bulk purchasing of background checks.

6.3.11 TSDB Hearings and Appeals

The risk-based performance standards require appropriate background checks for facility personnel, including measures designed to identify people with terrorist ties. Identifying personnel with terrorist ties can be achieved by checking against the consolidated Terrorist Screening Database (TSDB). The rule will provide individuals found by DHS to be a potential security threat after a check of the TSDB with the opportunity to seek an adjudications hearing and, if applicable, an appeal. Individuals requesting an adjudications proceeding are required to file and serve a Notice of Application for Review, Application for Review, and any other necessary filings. Individuals requesting an Appeal are required to file and serve a Notice of Appeal, Brief, and any other necessary filings. It is difficult to estimate the number of individuals that may be found to be a potential security threat. Strictly for purposes of this analysis, we will assume approximately 2% of workers will be disqualified based on their TSDB screening results. DHS assumes the time it will take to prepare the needed paperwork to request the hearing and subsequent appeal, if necessary, would take a total of 6 hours to complete. As discussed previously, DHS assumes a loaded hourly wage rate of $56 per worker based on the 90th percentile hourly wage for all workers in NAICS 3251 (Basic Chemical Manufacturing), including 40% for benefits. The costs of appeals for the TSDB are presented below.

For the purpose of estimating the cost of the TSDB appeals, there may be instances where a relatively higher-paid worker would be more likely to appeal a TSDB result. For example, a chemical engineer may have more of an incentive to appeal a TSDB result, as the chemical engineer's other employment possibilities may have a higher probability of requiring a background check. We also have anecdotal information that indicates a company may be more likely to assist a "new hire" that has more highly valued skills, (such as engineering and management occupations) when that "new hire" would need to appeal a TSDB result. For example, if a "new hire" chemical engineer needs to appeal a TSDB result, a company may have more of an incentive to assign a senior employee to provide assistance with the TSDB appeal so as to not lose the "new hire" as the company may have already invested a significant amount of time and resources in making the hire. The more time and resources a company has invested in recruiting and interviewing the hire, the more of an incentive the company would have to make sure the hire is not lost to another company.

Table 20. Opportunity Cost of the Paperwork Burden for Terrorist Screening Database Hearings and Appeals

	Total number of employees and contract workers (including annual 20% turnover)	Disqualification rate	Estimated number of employees and contract workers that may file a hearing/appeal	Paperwork Burden Hours per hearing/appeal	Average hourly rate (includes 40% benefits)	Total cost
2007	n/a	n/a	n/a	n/a	n/a	$0
2008*	613,910	2%	12,278	6	$56	4,125,480
2009**	551,790	2%	11,036	6	56	3,708,030
2010	177,290	2%	3,546	6	56	1,191,390
2011	177,290	2%	3,546	6	56	1,191,390
2012	177,290	2%	3,546	6	56	1,191,390
2013	177,290	2%	3,546	6	56	1,191,390
2014	177,290	2%	3,546	6	56	1,191,390
2015	177,290	2%	3,546	6	56	1,191,390
Total	n/a	n/a	n/a	n/a	n/a	$14,981,850

* includes Tiers 1-3

** includes Tier 4 and 20% annual turnover for Tiers 1-3

*** DHS does not have precise information regarding the number of employees or contractors; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

6.3.12 Visitor Escorts

Visitors to a facility who require access to restricted areas or critical assets will need an escort if the visitor does not have the appropriate background checks. However, since September 11, 2001, most facilities already require visitor escorts. It is often an administrative worker who is tasked with escorting visitors from the visitor gate to the area within the facility. The cost of providing escorts to visitors is based on the hourly rate for a secretary in NAICS 3251 at the 90th percentile and adding 40% for benefits, yielding a $33.00 loaded hourly wage. For Tiers 1-3, administrative workers are assumed, for the purpose of this analysis, to spend 12 hours per day providing escorts at Group A facilities. Visitor escorts at Tiers 1-3 for Groups B, C and facilities at risk for theft and diversion are assumed to be 4 hours per day, respectively. At Tier 4 facilities, the burden is assumed to be about 25% of that for Tiers 1-3. At Tier 4 facilities, we believe there will be fewer restricted areas or critical assets which will require fewer escorts. As a result, on an annual basis, the cost of escorting visitors for facilities during a 5-day work week in Tiers 1-3 is around $100,000 for Group A facilities and $35,000 for Groups B, C and theft and diversion. For Tier 4 facilities, the cost ranges from $8,750 for Groups B, C and theft and diversion to $25,000 for Group A facilities.

Appendix B provides descriptions of personnel and readiness measures discussed in all of section 6 above.

6.4 Requests for DHS Technical Assistance and Consultation

In order to initiate consultations or seek technical assistance, a covered facility shall submit a written request for consultation or technical assistance to the Coordinating Official or contact the Department in any other manner specified in any subsequent guidance. At this time, the Department does not have any reliable data on which to estimate with a reasonable degree of certainty the number of such written requests we might receive. For the purpose of this analysis, we will assume that we will receive 2,000 written requests. We will further assume that the SSO will spend 1 hour preparing this written request. As this Regulatory Assessment has already accounted for the opportunity cost of time for an SSO to perform the duties required to comply with the requirements of this rule, the time the SSO will spend to prepare this written request has already been accounted for in this analysis.

6.5 SSP Hearings and Appeals

If a facility's SSP is ultimately disapproved after reasonable opportunities for revisions and following consultations with the Department, and a facility contests that disapproval, a facility can seek an adjudications proceeding and, if applicable, a subsequent appeal. Facilities requesting an adjudications proceeding are required to file and serve a Notice of Application for Review, Application for Review, and any other necessary filings. Facilities subsequently seeking an Appeal are required to file and serve a Notice of Appeal, a Brief, and any other necessary filings. At this time, it is difficult to estimate the number of SSPs that will be ultimately disapproved. As a result, for the purposes of this analysis, DHS has assumed that approximately 20 facilities will request an adjudications proceeding and subsequent appeal after SSP disapproval. We also do not have enough information to determine how many facilities will seek an appeal after an adjudications proceeding. Consequently, DHS has assumed that 100% of facilities that request an adjudications proceeding will also file an appeal (if an appeal is necessary). DHS assumes that the paperwork burden to prepare the documents for the adjudications proceeding and possible subsequent appeal will require approximately 50 hours of time for several personnel. As this Regulatory Assessment has already accounted for the opportunity cost of time for an SSO to perform the duties required to comply with the requirements of this rule, the time the SSO will spend to prepare this written request has already been accounted for in this analysis The cost per facility of the time of the other personnel is $3,860. More detail is presented in Appendix E.

Table 21. Opportunity Cost of the Paperwork Burden for SSP Disapproval Hearing and Appeals

Number of Facilities	Paperwork Burden Cost of Hearing/Appeal *	Total cost for Hearings/Appeals
20	$3,860	$77,200

* excludes cost of SSO's time which is accounted for in the cost of the SSO

6.6 Potential Costs for Orange Threat Level

As mentioned previously, the cost estimates contained in this analysis are based on the "yellow" or elevated threat level as defined by DHS. Occasionally, as warranted by DHS, a facility may be placed at an "orange" or high threat level. As a result, the cost of anti-terrorism security will increase. Facilities will likely increase variable security measures to meet the surge demand for heightened security, such as guards. Solely for the purpose of illustrating costs for this analysis, we have assumed that an orange threat level will last for two weeks once per year, a total of 14 days per year. Further, DHS assumes that facilities will respond to a temporary orange threat level by hiring more guards in order to conduct more frequent patrols and implement tighter checks on vehicles and personnel entering the facility. To estimate the cost of the 2 week orange threat level, DHS assumes Tier 1 facilities will hire the equivalent of 8 guard positions, Tier 2 facilities will hire the equivalent of 6 guard positions, Tier 3 facilities will hire the equivalent of 3 guard positions, and Tier 4 facilities will hire the equivalent of 2 guard positions. DHS assumes these additional guards are unarmed.

DHS did not attempt to estimate costs for a red threat level because of the variability and uncertainty associated with the nature of a threat that would cause DHS to raise the alert level to red for a particular facility or region.

Table 22 presents the costs for one two-week orange threat level event per year. Because the shift to an orange threat level is not a predictable recurring cost, the costs presented below are not included in the total cost to facilities of the IFR. As these estimated costs are a very small fraction of the total costs of this rulemaking, this assumption does not appreciably change the total estimated cost of the rule.

Table 22. Facility Costs for Orange Threat Level

	Number of additional guard positions	Total cost per event per facility	Total Cost ($ mill)
Tier 1	8	$48,000	$8.3
Tier 2	6	36,000	$6.2
Tier 3	3	18,000	$3.1
Tier 4	2	12,000	$2.1
			$19.7

6.7 Security Investments Already Made by Facilities

DHS recognizes that many facilities have already made investments that enhance security. In order to estimate the incremental cost of the IFR to chemical facility

owners and/or operators, DHS has estimated the *additional* security enhancements that chemical facilities will make in order to comply with the risk-based performance standards. These estimates are based on DHS institutional knowledge of the chemical industry and readily available information. These assumptions will drive the aggregate cost to industry. Table 23 shows the assumptions DHS has made regarding the percentage of facilities that would incur the costs described above.

Table 23. Estimated Percentage of Facilities that will Purchase or Enhance Security Measures, by Facility Type

	Tier 1			Tier 2		
	Group A	Group B	Group C	Group A	Group B	Group C
Primary fence	10%	10%	50%	50%	50%	n/a
Secondary fence	95%	95%	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	50%	n/a	50%	50%	n/a
Receiving/Shipping area outside perimeter	85%	85%	n/a	85%	85%	n/a
Security control center	15%	15%	25%	25%	50%	67%
Staging area for vehicle screening	50%	67%	n/a	50%	75%	n/a
Active barriers at gate	80%	95%	95%	80%	95%	95%
Perimeter vehicle barrier	80%	90%	n/a	80%	90%	n/a
Electronic access controls and gate	50%	50%	50%	50%	50%	50%
Jersey barriers within site	25%	25%	25%	25%	25%	50%
Lighting (asset/inside)	50%	10%	n/a	10%	10%	n/a
Lighting (perimeter)	70%	90%	90%	70%	90%	90%
CCTV system	70%	80%	90%	70%	80%	90%
Fence line intrusion detection system	85%	95%	95%	85%	95%	95%
Communications system	5%	5%	5%	5%	5%	5%
Handheld radios	5%	5%	5%	5%	5%	5%
Install firewall	5%	5%	5%	5%	5%	5%
Locked access to inventory*	50%	50%	50%	50%	50%	50%
Design/Engineering	50%	50%	50%	50%	50%	50%
Guard position (24/7)	5%	10%	10%	5%	10%	10%
Armed guard position (24/7)	85%	95%	95%	85%	95%	95%
New SVA	25%	75%	75%	25%	75%	75%
New SSP	25%	75%	75%	25%	75%	75%
Review/Update SVA	75%	25%	25%	75%	25%	25%
Review/Update SSP	75%	25%	25%	75%	25%	25%
SSP (DHS mandated revisions)	25%	25%	25%	25%	25%	25%
Inspections	100%	100%	100%	100%	100%	100%
Site Security Officer**	100%	100%	100%	100%	100%	100%
Background checks	100%	100%	100%	100%	100%	100%
Visitor escorts	30%	30%	30%	30%	30%	30%
Annual Audits	95%	95%	95%	95%	95%	95%
Annual Drills	95%	95%	95%	95%	95%	95%
Security training	25%	75%	75%	25%	75%	75%
SSO training	95%	95%	95%	95%	95%	95%
Anti-theft/diversion training*	50%	50%	50%	50%	50%	50%

*add-on applicable to theft and diversion facilities only

** DHS assumes that 100% of facilities will require and SSO or a fraction of an SSO to comply with the IFR. The assumptions regarding the percentage of a full-time SSO are presented in Table 9.

Table 24. Estimated Percentage of Facilities that will Purchase or Enhance Security Measures, by Facility Type (continued)

	Tier 3			Tier 4		
	Group A	Group B	Group C	Group A	Group B	Group C
Primary fence	20%	20%	n/a	5%	5%	n/a
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	50%	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	5%	5%	n/a	n/a	n/a	n/a
Security control center	67%	75%	75%	n/a	n/a	n/a
Staging area for vehicle screening	10%	25%	n/a	n/a	n/a	n/a
Active barriers at gate	10%	10%	10%	n/a	n/a	n/a
Perimeter vehicle barrier	5%	5%	n/a	n/a	n/a	n/a
Electronic access controls and gate	50%	50%	50%	n/a	n/a	n/a
Jersey barriers within site	75%	75%	75%	n/a	n/a	n/a
Lighting (asset/inside)	15%	15%	n/a	5%	5%	n/a
Lighting (perimeter)	15%	15%	15%	10%	10%	10%
CCTV system	75%	85%	90%	85%	95%	95%
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	5%	5%	5%	5%	5%
Handheld radios	5%	10%	10%	5%	10%	10%
Install firewall	5%	5%	5%	5%	5%	5%
Locked access to inventory*	75%	75%	75%	75%	75%	75%
Design/Engineering	50%	50%	50%	50%	50%	50%
Guard position (24/7)	10%	25%	25%	n/a	n/a	n/a
Armed guard position (24/7)	n/a	n/a	n/a	n/a	n/a	n/a
New SVA	25%	75%	75%	25%	75%	75%
New SSP	25%	75%	75%	25%	75%	75%
Review/Update SVA	75%	25%	25%	75%	25%	25%
Review/Update SSP	75%	25%	25%	75%	25%	25%
SSP (DHS mandated revisions)	25%	25%	25%	25%	25%	25%
Inspections	100%	100%	100%	100%	100%	100%
Site Security Officer**	100%	100%	100%	100%	100%	100%
Background checks	100%	100%	100%	100%	100%	100%
Visitor escorts	30%	30%	30%	50%	50%	50%
Annual Audits	95%	95%	95%	95%	95%	95%
Annual Drills	95%	95%	95%	95%	95%	95%
Security training	75%	75%	75%	75%	75%	75%
SSO training	n/a	n/a	n/a	n/a	n/a	n/a
Anti-theft/diversion training*	75%	75%	75%	75%	75%	75%

* add-on applicable to theft and diversion facilities only

** DHS assumes that 100% of facilities will require and SSO or a fraction of an SSO to comply with the IFR. The assumptions regarding the percentage of a full-time SSO are presented in Table 9.

Table 25. Estimated Percentage of Facilities that will Purchase or Enhance Security Measures, by Facility Type (continued)

	Facilities Subject to Theft & Diversion Only			
	Tier 1	Tier 2	Tier 3	Tier 4
Primary fence**	10%	25%	10%	5%
Secondary fence	95%	n/a	n/a	n/a
Guard house/Entry point	10%	10%	10%	n/a
Receiving/Shipping area outside perimeter**	n/a	n/a	n/a	n/a
Security control center	10%	10%	10%	n/a
Staging area for vehicle screening**	10%	10%	10%	n/a
Active barriers at gate**	10%	10%	10%	n/a
Perimeter vehicle barrier	n/a	n/a	n/a	n/a
Electronic access controls and gate	50%	50%	50%	n/a
Jersey barriers within site	25%	25%	75%	n/a
Lighting (asset/inside)	90%	90%	15%	5%
Lighting (perimeter)	90%	90%	15%	10%
CCTV system	80%	80%	85%	95%
Fenceline intrusion detection system	50%	50%	n/a	n/a
Communications system	5%	5%	5%	5%
Handheld radios	5%	5%	10%	10%
Install firewall	5%	5%	5%	5%
Locked access to inventory	50%	50%	75%	75%
Design/Engineering	50%	50%	50%	50%
Guard position (24/7)	10%	10%	25%	n/a
Armed guard position (24/7)	95%	95%	n/a	n/a
New SVA	75%	75%	75%	75%
New SSP	75%	75%	75%	75%
Review/Update SVA	25%	25%	25%	25%
Review/Update SSP	25%	25%	25%	25%
SSP (DHS mandated revisions)	25%	25%	25%	25%
Inspections	100%	100%	100%	100%
Site Security Officer***	100%	100%	100%	100%
Background checks	100%	100%	100%	100%
Visitor escorts	50%	50%	50%	50%
Annual Audits	95%	95%	95%	95%
Annual Drills	95%	95%	95%	95%
Security training	75%	75%	75%	75%
SSO training	95%	95%	n/a	n/a
Anti-theft/diversion training	50%	50%	75%	75%

**add-on applicable to those theft and diversion only facilities that are open
*** DHS assumes that 100% of facilities will require and SSO or a fraction of an SSO to comply with the IFR. The assumptions regarding the percentage of a full-time SSO are presented in Table 9.

As discussed previously, it is difficult to provide a point estimate for the per facility cost of compliance with the risk based performance standards, thus an average is a rough approximation. The average cost for facilities after accounting for the estimated number of facilities that have already made security investments is outlined in Table 26. The initial costs shown below reflect the combined total initial capital costs[19] plus the initial whole year cost of other non-capital security measures, including guards, SSOs, training, drills, etc. and compliance requirements such as the SVA and the SSP. These costs exclude the cost of registration and Top-Screen which is examined separately. DHS provides the table below to illustrate the incremental cost of compliance with the risk based performance standards. To reflect capital budget cycles, DHS assumes capital costs will be spread out over a two-year period (2008 and 2009) for the purpose of this analysis. These costs are not discounted.

Table 26. Average Cost of Compliance with Risk Based Performance Standards by Model Facility

	Initial Cost*	Annual Cost
Tier 1 Group A	$5,317,140	$1,759,000
Tier 1 Group B	2,089,560	614,000
Tier 1 Group C	1,371,560	516,000
Tier 1 Theft	1,528,560	531,000
Tier 2 Group A	4,159,140	1,064,000
Tier 2 Group B	1,782,560	548,000
Tier 2 Group C	1,220,560	512,000
Tier 2 Theft	1,058,560	485,000
Tier 3 Group A	2,251,540	468,000
Tier 3 Group B	760,860	244,000
Tier 3 Group C	616,860	210,000
Tier 3 Theft	499,860	152,000
Tier 4 Group A	505,840	168,000
Tier 4 Group B	292,260	123,000
Tier 4 Group C	227,260	83,000
Tier 4 Theft	180,260	69,000

* includes annual cost for audits and drills.

[19] The initial capital costs shown here are not simply the capital costs incurred in the first year. The initial capital costs shown here reflect the capital costs incurred over a two-year period (2008-2009).

Table 27. Initial Cost and Annual Cost for Tier 1 facilities, Group A, primary population estimate (81 facilities/24 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	10%	1	750,000	6,075,000	1	75,000	607,500
Secondary fence	95%	1	750,000	57,712,500	1	75,000	5,771,250
Guard house/Entry point	50%	5	300,000	60,750,000	5	30,000	6,075,000
Receiving/Shipping area outside perimeter	85%	1	85,000	5,852,250	1	8,500	585,225
Security control center	15%	1	50,000	607,500	1	5,000	60,750
Staging area for vehicle screening	50%	5	2,000	405,000	5	200	40,500
Active barriers at gate	80%	5	85,000	27,540,000	5	8,500	2,754,000
Perimeter vehicle barrier	80%	1	30,000	1,944,000	1	3,000	194,400
Electronic access controls and gate	50%	1	350,000	14,175,000	1	35,000	1,417,500
Jersey barriers within site	25%	1	50,000	1,012,500	1	5,000	101,250
Lighting (asset/inside)	50%	1	80,000	3,240,000	1	8,000	324,000
Lighting (perimeter)	70%	1	800,000	45,360,000	1	80,000	4,536,000
CCTV system	70%	1	400,000	22,680,000	1	40,000	2,268,000
Fence line intrusion detection system	85%	1	600,000	41,310,000	1	60,000	4,131,000
Communications system	5%	1	400,000	1,620,000	1	40,000	162,000
Handheld radios	5%	1	100,000	405,000	1	10,000	40,500
Install firewall	5%	1	30,000	121,500	1	3,000	12,150
Design/Engineering	50%	1	7.5%	$10,905,384	n/a	n/a	n/a
Guard post (24/7)	5%	4	160,000	2,592,000	4	160,000	2,592,000
Armed guard post (24/7)	85%	5	260,000	89,505,000	5	260,000	89,505,000
New SVA [1]	25%	1	25,000	506,250	n/a	n/a	n/a
New SSP [1]	25%	1	20,000	405,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	75%	1	18,750	1,139,063	1	18,750	1,518,750
Review/Update SSP [1,2]	75%	1	5,000	303,750	1	5,000	405,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	101,250	n/a	n/a	n/a
Inspections	100%	1	7,900	639,900	n/a	n/a	n/a
SSO	100%	1	160,000	12,960,000	1	160,000	12,960,000
Background checks	100%	1	213,500	17,293,500	1	35,700	2,891,700
Visitor escorts	30%	1	100,000	2,430,000	1	100,000	2,430,000
Annual audits	95%	n/a	n/a	n/a	1	7,900	607,905
Annual drills	95%	n/a	n/a	n/a	1	2,240	172,368
Security training	25%	1	17,100	346,275	1	17,100	346,275
SSO training	95%	1	4,000	307,800	1	4,000	307,800
Subtotal				**$430,245,422**			**$142,817,823**
less SSO time (new VA) [1]	25%	1	6,700	135,675	n/a	n/a	n/a
less SSO time (review VA) [1,2]	75%	1	5,000	303,750	1	5,000	405,000
less SSO time (new SSP) [1]	25%	1	7,800	157,950	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	40,500	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	75%	1	2,000	121,500	1	2,000	162,000
Subtotal				**$429,486,047**			**$142,250,823**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	15,000	180,000	1	1,500	18,000
Anti-theft/diversion training	50%	1	17,100	205,200	1	17,100	205,200
Total cost including theft & diversion				**$429,871,247**			**$142,474,023**

* DHS does not have precise information regarding the number of Tier 1 Group A facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 28. Initial Cost and Annual Cost for Tier 1 facilities, Group B, primary population estimate (89 facilities/27 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	10%	1	500,000	4,450,000	1	50,000	445,000
Secondary fence	95%	1	500,000	42,275,000	1	50,000	4,227,500
Guard house/Entry point	50%	2	45,000	4,005,000	2	4,500	400,500
Receiving/Shipping area outside perimeter	85%	1	30,000	2,269,500	1	3,000	226,950
Security control center	15%	1	50,000	667,500	1	5,000	66,750
Staging area for vehicle screening	67%	2	2,000	238,520	2	200	23,852
Active barriers at gate	95%	2	85,000	14,373,500	2	8,500	1,437,350
Perimeter vehicle barrier	90%	1	6,000	480,600	1	600	48,060
Electronic access controls and gate	50%	1	100,000	4,450,000	1	10,000	445,000
Jersey barriers within site	25%	1	15,000	333,750	1	1,500	33,375
Lighting (asset/inside)	10%	1	35,000	311,500	1	3,500	31,150
Lighting (perimeter)	90%	1	250,000	20,025,000	1	25,000	2,002,500
CCTV system	80%	1	230,000	16,376,000	1	23,000	1,637,600
Fence line intrusion detection system	95%	1	300,000	25,365,000	1	30,000	2,536,500
Communications system	5%	1	300,000	1,335,000	1	30,000	133,500
Handheld radios	5%	1	15,000	66,750	1	1,500	6,675
Install firewall	5%	1	10,000	44,500	1	1,000	4,450
Design/Engineering	50%	1	7.5%	$5,140,017	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	1,424,000	1	160,000	1,424,000
Armed guard post (24/7)	95%	1	260,000	21,983,000	1	260,000	21,983,000
New SVA [1]	75%	1	20,000	1,335,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	1,335,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	333,750	1	15,000	1,335,000
Review/Update SSP [1,2]	25%	1	5,000	111,250	1	5,000	445,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	111,250	n/a	n/a	n/a
Inspections	100%	1	5,000	445,000	n/a	n/a	n/a
SSO	100%	1	160,000	14,240,000	1	160,000	14,240,000
Background checks	100%	1	17,500	1,557,500	1	2,800	249,200
Visitor escorts	30%	1	35,000	934,500	1	35,000	934,500
Annual audits	95%	n/a	n/a	n/a	1	5,000	422,750
Annual drills	95%	n/a	n/a	n/a	1	560	47,348
Security training	75%	1	1,400	93,450	1	1,400	93,450
SSO training	95%	1	4,000	338,200	1	4,000	338,200
Subtotal				**$186,449,037**			**$55,219,160**
less SSO time (new VA) [1]	75%	1	6,400	427,200	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	106,800	1	4,800	427,200
less SSO time (new SSP) [1]	75%	1	7,800	520,650	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	44,500	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	2,000	44,500	1	2,000	178,000
Subtotal				**$185,305,387**			**$54,613,960**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	10,000	135,000	1	1,000	13,500
Anti-theft/diversion training	50%	1	1,400	18,900	1	1,400	18,900
Total cost including theft & diversion				**$185,459,287**			**$54,646,360**

***** DHS does not have precise information regarding the number of Tier 1 Group B facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 29. Initial Cost and Annual Cost for Tier 1 facilities, Group C, primary population estimate (24 facilities/7 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	50%	1	500,000	6,000,000	1	50,000	600,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	25%	1	50,000	300,000	1	5,000	30,000
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	95%	1	85,000	1,938,000	1	8,500	193,800
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	50%	1	30,000	360,000	1	3,000	36,000
Jersey barriers within site	25%	1	15,000	90,000	1	1,500	9,000
Lighting (asset/inside)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (perimeter)	90%	1	80,000	1,728,000	1	8,000	172,800
CCTV system	90%	1	215,000	4,644,000	1	21,500	464,400
Fence line intrusion detection system	95%	1	200,000	4,560,000	1	20,000	456,000
Communications system	5%	1	300,000	360,000	1	30,000	36,000
Handheld radios	5%	1	5,000	6,000	1	500	600
Install firewall	5%	1	1,500	1,800	1	150	180
Design/Engineering	50%	1	7.5%	$749,543	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	384,000	1	160,000	384,000
Armed guard post (24/7)	95%	1	260,000	5,928,000	1	260,000	5,928,000
New SVA [1]	75%	1	20,000	360,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	360,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	90,000	1	15,000	360,000
Review/Update SSP [1,2]	25%	1	5,000	30,000	1	5,000	120,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	30,000	n/a	n/a	n/a
Inspections	100%	1	5,000	120,000	n/a	n/a	n/a
SSO	100%	1	120,000	2,880,000	1	120,000	2,880,000
Background checks	100%	1	70,000	1,680,000	1	11,550	277,200
Visitor escorts	30%	1	35,000	252,000	1	35,000	252,000
Annual audits	95%	n/a	n/a	n/a	1	5,000	114,000
Annual drills	95%	n/a	n/a	n/a	1	560	12,768
Security training	75%	1	5,600	100,800	1	5,600	100,800
SSO training	95%	1	4,000	91,200	1	4,000	91,200
Subtotal				**$33,043,343**			**$12,518,748**
less SSO time (new VA) [1]	75%	1	6,400	115,200	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	28,800	1	4,800	115,200
less SSO time (new SSP) [1]	75%	1	7,800	140,400	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	12,000	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	2,000	12,000	1	2,000	48,000
Subtotal				**$32,734,943**			**$12,355,548**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	10,000	35,000	1	1,000	3,500
Anti-theft/diversion training	50%	1	5,600	19,600	1	5,600	19,600
Total cost including theft & diversion				**$32,789,543**			**$12,378,648**

* DHS does not have precise information regarding the number of Tier 1 Group C facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 30. Initial Cost and Annual Cost for Tier 2 facilities, Group A, primary population estimate (166 facilities/50 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	50%	1	750,000	62,250,000	1	75,000	6,225,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	5	300,000	124,500,000	5	30,000	12,450,000
Receiving/Shipping area outside perimeter	85%	1	85,000	11,993,500	1	8,500	1,199,350
Security control center	25%	1	50,000	2,075,000	1	5,000	207,500
Staging area for vehicle screening	50%	5	2,000	830,000	5	200	83,000
Active barriers at gate	80%	5	85,000	56,440,000	5	8,500	5,644,000
Perimeter vehicle barrier	80%	1	30,000	3,984,000	1	3,000	398,400
Electronic access controls and gate	50%	1	350,000	29,050,000	1	35,000	2,905,000
Jersey barriers within site	25%	1	50,000	2,075,000	1	5,000	207,500
Lighting (asset/inside)	10%	1	80,000	1,328,000	1	8,000	132,800
Lighting (perimeter)	70%	1	800,000	92,960,000	1	80,000	9,296,000
CCTV system	70%	1	400,000	46,480,000	1	40,000	4,648,000
Fence line intrusion detection system	85%	1	600,000	84,660,000	1	60,000	8,466,000
Communications system	5%	1	400,000	3,320,000	1	40,000	332,000
Handheld radios	5%	1	100,000	830,000	1	10,000	83,000
Install firewall	5%	1	30,000	249,000	1	3,000	24,900
Design/Engineering	50%	1	7.5%	$19,613,419	n/a	n/a	n/a
Guard post (24/7)	5%	7	160,000	9,296,000	7	160,000	9,296,000
Armed guard post (24/7)	85%	2	260,000	73,372,000	2	260,000	73,372,000
New SVA [1]	25%	1	25,000	1,037,500	n/a	n/a	n/a
New SSP [1]	25%	1	20,000	830,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	75%	1	18,750	2,334,375	1	18,750	3,112,500
Review/Update SSP [1,2]	75%	1	5,000	622,500	1	5,000	830,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	207,500	n/a	n/a	n/a
Inspections	100%	1	7,900	1,311,400	n/a	n/a	n/a
SSO	100%	1	160,000	26,560,000	1	160,000	26,560,000
Background checks	100%	1	152,600	25,331,600	1	25,550	4,241,300
Visitor escorts	30%	1	100,000	4,980,000	1	100,000	4,980,000
Annual audits	95%	n/a	n/a	n/a	1	7,900	1,245,830
Annual drills	95%	n/a	n/a	n/a	1	2,240	353,248
Security training	25%	1	12,200	506,300	1	12,200	506,300
SSO training	95%	1	4,000	630,800	1	4,000	630,800
Subtotal				**$689,657,894**			**$177,430,428**
less SSO time (new VA) [1]	25%	1	6,700	278,050	n/a	n/a	n/a
less SSO time (review VA) [1,2]	75%	1	5,000	622,500	1	5,000	830,000
less SSO time (new SSP) [1]	25%	1	7,800	323,700	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	83,000	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	75%	1	2,000	249,000	1	2,000	332,000
Subtotal				**$688,101,644**			**$176,268,428**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	15,000	375,000	1	1,500	37,500
Anti-theft/diversion training	50%	1	12,200	305,000	1	12,200	305,000
Total cost including theft & diversion				**$688,781,644**			**$176,610,928**

* DHS does not have precise information regarding the number of Tier 2 Group A facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 31. Initial Cost and Annual Cost for Tier 2 facilities, Group B, primary population estimate (64 facilities/19 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	50%	1	500,000	16,000,000	1	50,000	1,600,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	2	45,000	2,880,000	2	4,500	288,000
Receiving/Shipping area outside perimeter	85%	1	30,000	1,632,000	1	3,000	163,200
Security control center	50%	1	50,000	1,600,000	1	5,000	160,000
Staging area for vehicle screening	75%	2	2,000	192,000	2	200	19,200
Active barriers at gate	95%	2	85,000	10,336,000	2	8,500	1,033,600
Perimeter vehicle barrier	90%	1	6,000	345,600	1	600	34,560
Electronic access controls and gate	50%	1	100,000	3,200,000	1	10,000	320,000
Jersey barriers within site	25%	1	15,000	240,000	1	1,500	24,000
Lighting (asset/inside)	10%	1	35,000	224,000	1	3,500	22,400
Lighting (perimeter)	90%	1	250,000	14,400,000	1	25,000	1,440,000
CCTV system	80%	1	230,000	11,776,000	1	23,000	1,177,600
Fence line intrusion detection system	95%	1	300,000	18,240,000	1	30,000	1,824,000
Communications system	5%	1	300,000	960,000	1	30,000	96,000
Handheld radios	5%	1	15,000	48,000	1	1,500	4,800
Install firewall	5%	1	10,000	32,000	1	1,000	3,200
Design/Engineering	50%	1	7.5%	$3,078,960	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	1,024,000	1	160,000	1,024,000
Armed guard post (24/7)	95%	1	260,000	15,808,000	1	260,000	15,808,000
New SVA [1]	75%	1	20,000	960,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	960,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	240,000	1	15,000	960,000
Review/Update SSP [1,2]	25%	1	5,000	80,000	1	5,000	320,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	80,000	n/a	n/a	n/a
Inspections	100%	1	5,000	320,000	n/a	n/a	n/a
SSO	100%	1	120,000	7,680,000	1	120,000	7,680,000
Background checks	100%	1	17,150	1,097,600	1	2,800	179,200
Visitor escorts	30%	1	35,000	672,000	1	35,000	672,000
Annual audits	95%	n/a	n/a	n/a	1	5,000	304,000
Annual drills	95%	n/a	n/a	n/a	1	560	34,048
Security training	75%	1	1,400	67,200	1	1,400	67,200
SSO training	95%	1	4,000	243,200	1	4,000	243,200
Subtotal				**$114,416,560**			**$35,502,208**
less SSO time (new VA) [1]	75%	1	6,400	307,200	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	76,800	1	4,800	307,200
less SSO time (new SSP) [1]	75%	1	7,800	374,400	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	32,000	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	2,000	32,000	1	2,000	128,000
Subtotal				**$113,594,160**			**$35,067,008**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	10,000	95,000	1	1,000	9,500
Anti-theft/diversion training	50%	1	1,400	13,300	1	1,400	13,300
Total cost including theft & diversion				**$113,702,460**			**$35,089,808**

* DHS does not have precise information regarding the number of Tier 2 Group B facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 32. Initial Cost and Annual Cost for Tier 2 facilities, Group C, primary population estimate (80 facilities/24 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	67%	1	50,000	2,680,000	1	5,000	268,000
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	95%	1	85,000	6,460,000	1	8,500	646,000
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	50%	1	30,000	1,200,000	1	3,000	120,000
Jersey barriers within site	50%	1	15,000	600,000	1	1,500	60,000
Lighting (asset/inside)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (perimeter)	90%	1	80,000	5,760,000	1	8,000	576,000
CCTV system	90%	1	215,000	15,480,000	1	21,500	1,548,000
Fence line intrusion detection system	95%	1	200,000	15,200,000	1	20,000	1,520,000
Communications system	5%	1	300,000	1,200,000	1	30,000	120,000
Handheld radios	5%	1	5,000	20,000	1	500	2,000
Install firewall	5%	1	1,500	6,000	1	150	600
Design/Engineering	50%	1	7.5%	$1,822,725	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	1,280,000	1	160,000	1,280,000
Armed guard post (24/7)	95%	1	260,000	19,760,000	1	260,000	19,760,000
New SVA [1]	75%	1	20,000	1,200,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	1,200,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	300,000	1	15,000	1,200,000
Review/Update SSP [1,2]	25%	1	5,000	100,000	1	5,000	400,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	100,000	n/a	n/a	n/a
Inspections	100%	1	5,000	400,000	n/a	n/a	n/a
SSO	100%	1	120,000	9,600,000	1	120,000	9,600,000
Background checks	100%	1	146,650	11,732,000	1	24,500	1,960,000
Visitor escorts	30%	1	35,000	840,000	1	35,000	840,000
Annual audits	95%	n/a	n/a	n/a	1	5,000	380,000
Annual drills	95%	n/a	n/a	n/a	1	560	42,560
Security training	75%	1	11,700	702,000	1	11,700	702,000
SSO training	95%	1	4,000	304,000	1	4,000	304,000
Subtotal				**$97,946,725**			**$41,329,160**
less SSO time (new VA) [1]	75%	1	6,400	384,000	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	96,000	1	4,800	384,000
less SSO time (new SSP) [1]	75%	1	7,800	468,000	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	2,000	40,000	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	2,000	40,000	1	2,000	160,000
Subtotal				**$96,918,725**			**$40,785,160**
Theft & diversion Add-Ons							
Locked access to inventory	50%	1	10,000	120,000	1	1,000	12,000
Anti-theft/diversion training	50%	1	11,700	140,400	1	11,700	140,400
Total cost including theft & diversion				**$97,179,125**			**$40,937,560**

* DHS does not have precise information regarding the number of Tier 2 Group C facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 33. Initial Cost and Annual Cost for Tier 3 facilities, Group A, primary population estimate (315 facilities/95 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	20%	1	750,000	47,250,000	1	75,000	4,725,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	5	300,000	236,250,000	5	30,000	23,625,000
Receiving/Shipping area outside perimeter	5%	1	85,000	1,338,750	1	8,500	133,875
Security control center	67%	1	50,000	10,552,500	1	5,000	1,055,250
Staging area for vehicle screening	10%	1	2,000	63,000	1	200	6,300
Active barriers at gate	10%	5	85,000	13,387,500	5	8,500	1,338,750
Perimeter vehicle barrier	5%	1	30,000	472,500	1	3,000	47,250
Electronic access controls and gate	50%	1	350,000	55,125,000	1	35,000	5,512,500
Jersey barriers within site	75%	1	50,000	11,812,500	1	5,000	1,181,250
Lighting (asset/inside)	15%	1	80,000	3,780,000	1	8,000	378,000
Lighting (perimeter)	15%	1	800,000	37,800,000	1	80,000	3,780,000
CCTV system	75%	1	400,000	94,500,000	1	40,000	9,450,000
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	1	400,000	6,300,000	1	40,000	630,000
Handheld radios	5%	1	100,000	1,575,000	1	10,000	157,500
Install firewall	5%	1	30,000	472,500	1	3,000	47,250
Design/Engineering	50%	1	7.5%	$19,525,472	n/a	n/a	n/a
Guard post (24/7)	10%	4	160,000	20,160,000	4	160,000	20,160,000
Armed guard post (24/7)	0%	0	260,000	-	n/a	n/a	n/a
New SVA [1]	25%	1	25,000	1,968,750	n/a	n/a	n/a
New SSP [1]	25%	1	10,000	787,500	n/a	n/a	n/a
Review/Update SVA [1,2,3]	75%	1	18,750	4,429,688	1	18,750	5,906,250
Review/Update SSP [1,2]	75%	1	2,500	590,625	1	2,500	787,500
SSP (DHS mandated revisions) [1]	25%	1	2,500	196,875	n/a	n/a	n/a
Inspections	100%	1	6,300	1,984,500	n/a	n/a	n/a
SSO	100%	1	120,000	37,800,000	1	120,000	37,800,000
Background checks	100%	1	266,000	83,790,000	1	44,450	14,001,750
Visitor escorts	30%	1	100,000	9,450,000	1	100,000	9,450,000
Annual audits	95%	n/a	n/a	n/a	1	6,300	1,885,275
Annual drills	95%	n/a	n/a	n/a	1	2,240	670,320
Security training	75%	1	21,300	5,032,125	1	21,300	5,032,125
SSO training	0%	1	-	-	n/a	n/a	n/a
Subtotal				**$706,394,784**			**$147,761,145**
less SSO time (new VA) [1]	25%	1	6,700	527,625	n/a	n/a	n/a
less SSO time (review VA) [1,2]	75%	1	5,000	1,181,250	1	5,000	1,575,000
less SSO time (new SSP) [1]	25%	1	3,900	307,125	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	1,000	78,750	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	75%	1	1,000	236,250	1	1,000	315,000
Subtotal				**$704,063,784**			**$145,871,145**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	15,000	1,068,750	1	1,500	106,875
Anti-theft/diversion training	75%	1	21,300	1,517,625	1	21,300	1,517,625
Total cost including theft & diversion				**$706,650,159**			**$147,495,645**

* DHS does not have precise information regarding the number of Tier 3 Group A facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.
[1] The SVA and SSP include all costs, including the cost of the time of the SSO.
[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.
[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 34. Initial Cost and Annual Cost for Tier 3 facilities, Group B, primary population estimate (438 facilities/131 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	20%	1	500,000	43,800,000	1	50,000	4,380,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	50%	2	45,000	19,710,000	2	4,500	1,971,000
Receiving/Shipping area outside perimeter	5%	1	30,000	657,000	1	3,000	65,700
Security control center	75%	1	50,000	16,425,000	1	5,000	1,642,500
Staging area for vehicle screening	25%	1	2,000	219,000	1	200	21,900
Active barriers at gate	10%	2	85,000	7,446,000	2	8,500	744,600
Perimeter vehicle barrier	5%	1	6,000	131,400	1	600	13,140
Electronic access controls and gate	50%	1	100,000	21,900,000	1	10,000	2,190,000
Jersey barriers within site	75%	1	15,000	4,927,500	1	1,500	492,750
Lighting (asset/inside)	15%	1	35,000	2,299,500	1	3,500	229,950
Lighting (perimeter)	15%	1	250,000	16,425,000	1	25,000	1,642,500
CCTV system	85%	1	230,000	85,629,000	1	23,000	8,562,900
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	1	300,000	6,570,000	1	30,000	657,000
Handheld radios	10%	1	15,000	657,000	1	1,500	65,700
Install firewall	5%	1	10,000	219,000	1	1,000	21,900
Design/Engineering	50%	1	7.5%	$8,513,078	n/a	n/a	n/a
Guard post (24/7)	25%	2	160,000	35,040,000	2	160,000	35,040,000
Armed guard post (24/7)	0%	0	260,000	-	n/a	n/a	n/a
New SVA [1]	75%	1	20,000	6,570,000	n/a	n/a	n/a
New SSP [1]	75%	1	10,000	3,285,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	1,642,500	1	15,000	6,570,000
Review/Update SSP [1,2]	25%	1	2,500	273,750	1	2,500	1,095,000
SSP (DHS mandated revisions) [1]	25%	1	2,500	273,750	n/a	n/a	n/a
Inspections	100%	1	3,300	1,445,400	n/a	n/a	n/a
SSO	100%	1	80,000	35,040,000	1	80,000	35,040,000
Background checks	100%	1	23,450	10,271,100	1	3,850	1,686,300
Visitor escorts	30%	1	35,000	4,599,000	1	35,000	4,599,000
Annual audits	95%	n/a	n/a	n/a	1	3,300	1,373,130
Annual drills	95%	n/a	n/a	n/a	1	560	233,016
Security training	75%	1	2,000	657,000	1	2,000	657,000
SSO training	0%	1	n/a	n/a	n/a	n/a	n/a
Subtotal				**$334,625,978**			**$108,994,986**
less SSO time (new VA) [1]	75%	1	6,400	2,102,400	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	525,600	1	4,800	2,102,400
less SSO time (new SSP) [1]	75%	1	3,900	1,281,150	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	1,000	109,500	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	1,000	109,500	1	1,000	438,000
Subtotal				**$330,497,828**			**$106,454,586**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	10,000	982,500	1	1,000	98,250
Anti-theft/diversion training	75%	1	2,000	196,500	1	2,000	196,500
Total cost including theft & diversion				**$331,676,828**			**$106,749,336**

* DHS does not have precise information regarding the number of Tier 3 Group B facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 35. Initial Cost and Annual Cost for Tier 3 facilities, Group C, primary population estimate (329 facilities/99 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	75%	1	50,000	12,337,500	1	5,000	1,233,750
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	10%	1	85,000	2,796,500	1	8,500	279,650
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	50%	1	30,000	4,935,000	1	3,000	493,500
Jersey barriers within site	75%	1	15,000	3,701,250	1	1,500	370,125
Lighting (asset/inside)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (perimeter)	15%	1	80,000	3,948,000	1	8,000	394,800
CCTV system	90%	1	215,000	63,661,500	1	21,500	6,366,150
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	1	300,000	4,935,000	1	30,000	493,500
Handheld radios	10%	1	5,000	164,500	1	500	16,450
Install firewall	5%	1	1,500	24,675	1	150	2,468
Design/Engineering	50%	1	7.5%	$3,618,897	n/a	n/a	n/a
Guard post (24/7)	25%	2	160,000	26,320,000	2	160,000	26,320,000
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New SVA [1]	75%	1	20,000	4,935,000	n/a	n/a	n/a
New SSP [1]	75%	1	10,000	2,467,500	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	1,233,750	1	15,000	4,935,000
Review/Update SSP [1,2]	25%	1	2,500	205,625	1	2,500	822,500
SSP (DHS mandated revisions) [1]	25%	1	2,500	205,625	n/a	n/a	n/a
Inspections	100%	1	3,300	1,085,700	n/a	n/a	n/a
SSO	100%	1	40,000	13,160,000	1	40,000	13,160,000
Background checks	100%	1	143,150	47,096,350	1	23,800	7,830,200
Visitor escorts	30%	1	35,000	3,454,500	1	35,000	3,454,500
Annual audits	95%	n/a	n/a	n/a	1	3,300	1,031,415
Annual drills	95%	n/a	n/a	n/a	1	560	175,028
Security training	75%	1	11,500	2,837,625	1	11,500	2,837,625
SSO training	0%	1	-	-	n/a	n/a	n/a
Subtotal				**$203,124,497**			**$70,216,661**
less SSO time (new VA) [1]	75%	1	6,400	1,579,200	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	394,800	1	4,800	1,579,200
less SSO time (new SSP) [1]	75%	1	3,900	962,325	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	1,000	82,250	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	1,000	82,250	1	1,000	329,000
Subtotal				**$200,023,672**			**$68,308,461**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	10,000	742,500	1	1,000	74,250
Anti-theft/diversion training	75%	1	11,500	853,875	1	11,500	853,875
Total cost including theft & diversion				**$201,620,047**			**$69,236,586**

* DHS does not have precise information regarding the number of Tier 3 Group C facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 36. Initial Cost and Annual Cost for Tier 4 facilities, Group A, primary population estimate (242 facilities/73 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	5%	1	750,000	9,075,000	1	75,000	907,500
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jersey barriers within site	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (asset/inside)	5%	1	80,000	968,000	1	8,000	96,800
Lighting (perimeter)	10%	1	800,000	19,360,000	1	80,000	1,936,000
CCTV system	85%	1	100,000	20,570,000	1	10,000	2,057,000
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	1	100,000	1,210,000	1	10,000	121,000
Handheld radios	5%	1	25,000	302,500	1	2,500	30,250
Install firewall	5%	1	30,000	363,000	1	3,000	36,300
Design/Engineering	50%	1	7.5%	$1,944,319	n/a	n/a	n/a
Guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New SVA [1]	25%	1	15,000	907,500	n/a	n/a	n/a
New SSP [1]	25%	1	5,000	302,500	n/a	n/a	n/a
Review/Update SVA [1,2,3]	75%	1	11,250	2,041,875	1	11,250	2,722,500
Review/Update SSP [1,2]	75%	1	1,250	226,875	1	1,250	302,500
SSP (DHS mandated revisions) [1]	25%	1	1,250	75,625	n/a	n/a	n/a
Inspections	100%	1	4,600	1,113,200	n/a	n/a	n/a
SSO	100%	1	80,000	19,360,000	1	80,000	19,360,000
Background checks	100%	1	154,700	37,437,400	1	25,900	6,267,800
Visitor escorts	50%	1	25,000	3,025,000	1	25,000	3,025,000
Annual audits	95%	n/a	n/a	n/a	1	4,600	1,057,540
Annual drills	95%	n/a	n/a	n/a	1	2,240	514,976
Security training	75%	1	12,400	2,250,600	1	12,400	2,250,600
SSO training	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal				**$120,533,394**			**$40,685,766**
less SSO time (new VA) [1]	75%	1	4,200	762,300	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	3,100	187,550	1	3,100	750,200
less SSO time (new SSP) [1]	75%	1	2,000	363,000	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	500	30,250	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	500	30,250	1	500	121,000
Subtotal				**$119,160,044**			**$39,814,566**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	15,000	821,250	1	1,500	82,125
Anti-theft/diversion training	75%	1	12,400	678,900	1	12,400	678,900
Total cost including theft & diversion				**$120,660,194**			**$40,575,591**

* DHS does not have precise information regarding the number of Tier 4 Group A facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 37. Initial Cost and Annual Cost for Tier 4 facilities, Group B, primary population estimate (690 facilities/207 theft-add on facilities)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	5%	1	500,000	17,250,000	1	50,000	1,725,000
Secondary fence	n/a	n/a	n/a	n/a	n/a	50,000	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	4,500	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	3,000	n/a
Security control center	n/a	n/a	n/a	n/a	n/a	5,000	n/a
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	200	n/a
Active barriers at gate	n/a	n/a	n/a	n/a	n/a	8,500	n/a
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	600	n/a
Electronic access controls and gate	n/a	n/a	n/a	n/a	n/a	10,000	n/a
Jersey barriers within site	n/a	n/a	n/a	n/a	n/a	1,500	n/a
Lighting (asset/inside)	5%	1	35,000	1,207,500	1	3,500	120,750
Lighting (perimeter)	10%	1	250,000	17,250,000	1	25,000	1,725,000
CCTV system	95%	1	57,500	37,691,250	1	5,750	3,769,125
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	30,000	n/a
Communications system	5%	1	75,000	2,587,500	1	7,500	258,750
Handheld radios	10%	1	3,750	258,750	1	375	25,875
Install firewall	5%	1	10,000	345,000	1	1,000	34,500
Design/Engineering	50%	1	7.5%	$2,872,125	n/a	n/a	n/a
Guard post (24/7)	n/a	n/a	n/a	n/a	n/a	160,000	n/a
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	260,000	n/a
New SVA [1]	75%	1	12,000	6,210,000	n/a	n/a	n/a
New SSP [1]	75%	1	5,000	2,587,500	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	9,000	1,552,500	1	9,000	6,210,000
Review/Update SSP [1,2]	25%	1	1,250	215,625	1	1,250	862,500
SSP (DHS mandated revisions) [1]	25%	1	1,250	215,625	n/a	n/a	n/a
Inspections	100%	1	1,700	1,173,000	n/a	n/a	n/a
SSO	100%	1	80,000	55,200,000	1	80,000	55,200,000
Background checks	100%	1	70,000	48,300,000	1	11,550	7,969,500
Visitor escorts	50%	1	8,750	3,018,750	1	8,750	3,018,750
Annual audits	95%	n/a	n/a	n/a	1	1,700	1,114,350
Annual drills	95%	n/a	n/a	n/a	1	560	367,080
Security training	75%	1	5,700	2,949,750	1	5,700	2,949,750
SSO training	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal				**$200,884,875**			**$85,350,930**
less SSO time (new VA) [1]	75%	1	2,900	1,500,750	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	2,200	379,500	1	2,200	1,518,000
less SSO time (new SSP) [1]	75%	1	2,000	1,035,000	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	500	86,250	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	500	86,250	1	500	345,000
Subtotal				**$197,797,125**			**$83,487,930**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	10,000	1,552,500	1	1,000	155,250
Anti-theft/diversion training	75%	1	5,700	884,925	1	5,700	884,925
Total cost including theft & diversion				**$200,234,550**			**$84,528,105**

* DHS does not have precise information regarding the number of Tier 4 Group B facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 38. Initial Cost and Annual Cost for Tier 4 facilities, Group C, primary population estimate (599 facilities/180 theft-add on facilities)*

	Initial				Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Primary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receiving/Shipping area outside perimeter	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Perimeter vehicle barrier	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jersey barriers within site	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (asset/inside)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (perimeter)	10%	1	80,000	4,792,000	1	8,000	479,200
CCTV system	95%	1	53,750	30,586,438	1	5,375	3,058,644
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Communications system	5%	1	75,000	2,246,250	1	7,500	224,625
Handheld radios	10%	1	1,250	74,875	1	125	7,488
Install firewall	5%	1	1,500	44,925	1	150	4,493
Design/Engineering	50%	100.0%	7.5%	$1,415,418	n/a	n/a	n/a
Guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New SVA [1]	75%	1	12,000	5,391,000	n/a	n/a	n/a
New SSP [1]	75%	1	5,000	2,246,250	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	9,000	1,347,750	1	9,000	5,391,000
Review/Update SSP [1,2]	25%	1	1,250	187,188	1	1,250	748,750
SSP (DHS mandated revisions) [1]	25%	1	1,250	187,188	n/a	n/a	n/a
Inspections	100%	1	1,700	1,018,300	n/a	n/a	n/a
SSO	100%	1	40,000	23,960,000	1	40,000	23,960,000
Background checks	100%	1	92,750	55,557,250	1	15,400	9,224,600
Visitor escorts	50%	1	8,750	2,620,625	1	8,750	2,620,625
Annual audits	95%	n/a	n/a	n/a	1	1,700	967,385
Annual drills	95%	n/a	n/a	n/a	1	560	318,668
Security training	75%	1	7,400	3,324,450	1	7,400	3,324,450
SSO training	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Subtotal				**$134,999,906**			**$50,329,927**
less SSO time (new VA) [1]	75%	1	2,900	1,302,825	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	2,200	329,450	1	2,200	1,317,800
less SSO time (new SSP) [1]	75%	1	2,000	898,500	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	500	74,875	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	500	74,875	1	500	299,500
Subtotal				**$132,319,381**			**$48,712,627**
Theft & diversion Add-Ons							
Locked access to inventory	75%	1	10,000	1,350,000	1	1,000	135,000
Anti-theft/diversion training	75%	1	7,400	999,000	1	7,400	999,000
Total cost including theft & diversion				**$134,668,381**			**$49,846,627**

* DHS does not have precise information regarding the number of Tier 4 Group C facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 39. Initial Cost and Annual Cost for Tier 1 facilities, Theft and Diversion (6 facilities/1 open add-on)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Secondary fence	95%	1	$500,000	$2,850,000	1	$50,000	$285,000
Security control center	10%	1	$50,000	$30,000	1	$5,000	$3,000
Electronic access controls and gate	50%	1	100,000	300,000	1	10,000	30,000
Jersey barriers within site	25%	1	15,000	22,500	1	1,500	2,250
Lighting (asset/inside)	90%	1	35,000	189,000	1	3,500	18,900
Lighting (perimeter)	90%	1	250,000	1,350,000	1	25,000	135,000
CCTV system	80%	1	230,000	1,104,000	1	23,000	110,400
Communications system	5%	1	300,000	90,000	1	30,000	9,000
Handheld radios	5%	1	15,000	4,500	1	1,500	450
Install firewall	5%	1	10,000	3,000	1	1,000	300
Locked access to inventory	50%	1	10,000	30,000	1	1,000	3,000
Design/Engineering	50%	1	7.5%	$231,353	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	96,000	1	160,000	96,000
Armed guard post (24/7)	95%	1	260,000	1,482,000	1	260,000	1,482,000
New SVA [1]	75%	1	20,000	90,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	90,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	22,500	1	15,000	90,000
Review/Update SSP [1,2]	25%	1	5,000	7,500	1	5,000	30,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	7,500	n/a	n/a	n/a
Inspections	100%	1	5,000	30,000	n/a	n/a	n/a
SSO	100%	1	120,000	720,000	1	120,000	720,000
Background checks	100%	1	16,450	98,700	1	2,800	16,800
Visitor escorts	50%	1	35,000	105,000	1	35,000	105,000
Annual audits	95%	n/a	n/a	n/a	1	5,000	28,500
Annual drills	95%	n/a	n/a	n/a	1	560	3,192
Security training	75%	1	1,300	5,850	1	1,300	5,850
SSO training	95%	1	4,000	22,800	1	4,000	22,800
Anti-theft/diversion training	50%	1	1,300	3,900	1	1,300	3,900
Subtotal				**$8,986,103**			**$3,201,342**
less SSO time (new VA) [1]	75%	1	6,400	28,800	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	4,800	7,200	1	4,800	28,800
less SSO time (new SSP) [1]	75%	1	7,800	35,100	n/a	n/a	n/a
less SSO time (DHS mandated	25%	1	2,000	3,000	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	2,000	3,000	1	2,000	12,000
Subtotal				**$8,909,003**			**$3,160,542**
Add-ons for open plan facilities							
Primary fence	10%	1	500,000	50,000	1	50,000	5,000
Guard house/Entry point	10%	2	45,000	9,000	2	4,500	900
Staging area for vehicle screening	10%	2	2,000	400	2	200	40
Active barriers at gate	10%	2	85,000	17,000	2	8,500	1,700
Fence line intrusion detection system	50%	1	300,000	150,000	1	30,000	15,000
Total including add-ons for open facilities				**$9,135,403**			**$3,183,182**

* DHS does not have precise information regarding the number of Tier 1 Theft & Diversion facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 40. Initial Cost and Annual Cost for Tier 2 facilities, Theft and Diversion, primary population estimate (189 facilities/38 open add-on)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	10%	1	$50,000	$945,000	1	$5,000	$94,500
Electronic access controls and gate	50%	1	100,000	9,450,000	1	10,000	945,000
Jersey barriers within site	25%	1	15,000	708,750	1	1,500	70,875
Lighting (asset/inside)	90%	1	35,000	5,953,500	1	3,500	595,350
Lighting (perimeter)	90%	1	250,000	42,525,000	1	25,000	4,252,500
CCTV system	80%	1	230,000	34,776,000	1	23,000	3,477,600
Communications system	5%	1	300,000	2,835,000	1	30,000	283,500
Handheld radios	5%	1	15,000	141,750	1	1,500	14,175
Install firewall	5%	1	10,000	94,500	1	1,000	9,450
Locked access to inventory	50%	1	10,000	945,000	1	1,000	94,500
Design/Engineering	50%	1	7.5%	$4,083,101	n/a	n/a	n/a
Guard post (24/7)	10%	1	160,000	3,024,000	1	160,000	3,024,000
Armed guard post (24/7)	95%	1	260,000	46,683,000	1	260,000	46,683,000
New SVA [1]	75%	1	20,000	2,835,000	n/a	n/a	n/a
New SSP [1]	75%	1	20,000	2,835,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	708,750	1	15,000	2,835,000
Review/Update SSP [1,2]	25%	1	5,000	236,250	1	5,000	945,000
SSP (DHS mandated revisions) [1]	25%	1	5,000	236,250	n/a	n/a	n/a
Inspections	100%	1	5,000	945,000	n/a	n/a	n/a
SSO	100%	1	120,000	22,680,000	1	120,000	22,680,000
Background checks	100%	1	16,450	3,109,050	1	2,800	529,200
Visitor escorts	50%	1	35,000	3,307,500	1	35,000	3,307,500
Annual audits	95%	n/a	n/a	n/a	1	$5,000	$897,750
Annual drills	95%	n/a	n/a	n/a	1	$560	$100,548
Security training	75%	1	1,300	184,275	1	1,300	184,275
SSO training	95%	1	4,000	718,200	1	4,000	718,200
Anti-theft/diversion training	50%	1	1,300	122,850	1	1,300	122,850
Subtotal				**$190,082,726**			**$91,864,773**
less SSO time (new VA) [1]	75%	1	6,400	907,200			
less SSO time (review VA) [1,2]	25%	1	4,800	226,800	1	4,800	907,200
less SSO time (new SSP) [1]	75%	1	7,800	1,105,650			
less SSO time (DHS mandated	25%	1	2,000	94,500			
less SSO time (review SSP) [1,2]	25%	1	2,000	94,500	1	2,000	378,000
Subtotal				**$187,654,076**			**$90,579,573**
Add-ons for open plan facilities							
Primary fence	25%	1	500,000	4,750,000	1	50,000	475,000
Guard house/Entry point	10%	2	45,000	342,000	2	4,500	34,200
Staging area for vehicle screening	10%	2	2,000	15,200	2	200	1,520
Active barriers at gate	10%	2	85,000	646,000	2	8,500	64,600
Fence line intrusion detection system	50%	1	300,000	5,700,000	1	30,000	570,000
Total including add-ons for open facilities				**$199,107,276**			**$91,724,893**

* DHS does not have precise information regarding the number of Tier 2 Theft & Diversion facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 41. Initial Cost and Annual Cost for Tier 3 facilities, Theft and Diversion, primary population estimate (718 facilities/144 open add-on)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	10%	1	$50,000	$3,590,000	1	$5,000	$359,000
Electronic access controls and gate	50%	1	100,000	35,900,000	1	10,000	3,590,000
Jersey barriers within site	75%	1	15,000	8,077,500	1	1,500	807,750
Lighting (asset/inside)	15%	1	35,000	3,769,500	1	3,500	376,950
Lighting (perimeter)	15%	1	250,000	26,925,000	1	25,000	2,692,500
CCTV system	85%	1	230,000	140,369,000	1	23,000	14,036,900
Communications system	5%	1	300,000	10,770,000	1	30,000	1,077,000
Handheld radios	10%	1	15,000	1,077,000	1	1,500	107,700
Install firewall	5%	1	10,000	359,000	1	1,000	35,900
Locked access to inventory	75%	1	10,000	5,385,000	1	1,000	538,500
Design/Engineering	50%	1	7.5%	9,067,868	n/a	n/a	n/a
Guard post (24/7)	25%	1	160,000	28,720,000	1	160,000	28,720,000
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New SVA [1]	75%	1	20,000	10,770,000	n/a	n/a	n/a
New SSP [1]	75%	1	10,000	5,385,000	n/a	n/a	n/a
Review/Update SVA [1,2,3]	25%	1	15,000	2,692,500	1	15,000	10,770,000
Review/Update SSP [1,2]	25%	1	2,500	448,750	1	2,500	1,795,000
SSP (DHS mandated revisions) [1]	25%	1	2,500	448,750	n/a	n/a	n/a
Inspections	100%	1	3,300	2,369,400	n/a	n/a	n/a
SSO	100%	1	40,000	28,720,000	1	40,000	28,720,000
Background checks	100%	1	16,450	11,811,100	1	2,800	2,010,400
Visitor escorts	50%	1	35,000	12,565,000	1	35,000	12,565,000
Annual audits	95%	n/a	n/a	n/a	1	3,300	2,250,930
Annual drills	95%	n/a	n/a	n/a	1	560	381,976
Security training	75%	1	1,300	700,050	1	1,300	700,050
SSO training	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Anti-theft/diversion training	75%	1	1,300	700,050	1	1,300	700,050
Subtotal				**$350,620,468**			**$112,235,606**
less SSO time (new VA) [1]	25%	1	6,400	1,148,800	n/a	n/a	n/a
less SSO time (review VA) [1,2]	75%	1	4,800	2,584,800	1	4,800	3,446,400
less SSO time (new SSP) [1]	25%	1	3,900	700,050	n/a	n/a	n/a
less SSO time (DHS mandated	25%	1	1,000	179,500	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	75%	1	1,000	538,500	1	1,000	718,000
Subtotal				**$345,468,818**			**$108,071,206**
Add-ons for open plan facilities							
Primary fence	10%	1	500,000	7,200,000	1	50,000	720,000
Guard house/Entry point	10%	2	45,000	1,296,000	2	4,500	129,600
Staging area for vehicle screening	10%	1	2,000	28,800	1	200	2,880
Active barriers at gate	10%	2	85,000	2,448,000	2	8,500	244,800
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total including add-ons for open facilities				**$356,441,618**			**$109,168,486**

* DHS does not have precise information regarding the number of Tier 3 Theft & Diversion facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

Table 42. Initial Cost and Annual Cost for Tier 4 facilities, Theft and Diversion, primary population estimate (970 facilities/194 open add-on)*

		Initial			Annual		
	% est. to purchase	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Secondary fence	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Security control center	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic access controls and gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Jersey barriers within site	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lighting (asset/inside)	5%	1	35,000	1,697,500	1	3,500	169,750
Lighting (perimeter)	10%	1	250,000	24,250,000	1	25,000	2,425,000
CCTV system	95%	1	57,500	52,986,250	1	5,750	5,298,625
Communications system	5%	1	75,000	3,637,500	1	7,500	363,750
Handheld radios	10%	1	3,750	363,750	1	375	36,375
Install firewall	5%	1	10,000	485,000	1	1,000	48,500
Locked access to inventory	75%	1	10,000	7,275,000	1	1,000	727,500
Design/Engineering	50%	1	7.5%	$3,310,125	n/a	n/a	n/a
Guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Armed guard post (24/7)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
New SVA [1]	75%	1	12,000	8,730,000	-	12,000	-
New SSP [1]	75%	1	5,000	3,637,500	-	5,000	-
Review/Update SVA [1,2,3]	25%	1	9,000	2,182,500	1	9,000	8,730,000
Review/Update SSP [1,2]	25%	1	1,250	303,125	1	1,250	1,212,500
SSP (DHS mandated revisions) [1]	25%	1	1,250	303,125	n/a	n/a	n/a
Inspections	100%	1	1,700	1,649,000	n/a	n/a	n/a
SSO	100%	1	40,000	38,800,000	1	40,000	38,800,000
Background checks	100%	1	16,450	15,956,500	1	2,800	2,716,000
Visitor escorts	50%	1	8,750	4,243,750	1	8,750	4,243,750
Annual audits	95%	n/a	n/a	n/a	1	1,700	1,566,550
Annual drills	95%	n/a	n/a	n/a	1	560	516,040
Security training	75%	1	1,300	945,750	1	1,300	945,750
SSO training	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Anti-theft/diversion training	75%	1	1,300	945,750	1	1,300	945,750
Subtotal				**$171,702,125**			**$68,745,840**
less SSO time (new VA) [1]	75%	1	2,900	2,109,750	n/a	n/a	n/a
less SSO time (review VA) [1,2]	25%	1	2,200	533,500	1	2,200	2,134,000
less SSO time (new SSP) [1]	75%	1	2,000	1,455,000	n/a	n/a	n/a
less SSO time (DHS mandated revisions)[1]	25%	1	500	121,250	n/a	n/a	n/a
less SSO time (review SSP) [1,2]	25%	1	500	121,250	1	500	485,000
Subtotal				**$167,361,375**			**$66,126,840**
Add-ons for open plan facilities							
Primary fence	5%	1	500,000	4,850,000	1	50,000	485,000
Guard house/Entry point	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Staging area for vehicle screening	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Active barriers at gate	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fence line intrusion detection system	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total including add-ons for open facilities				**$172,211,375**			**$66,611,840**

* DHS does not have precise information regarding the number of Tier 4 Theft & Diversion facilities; however, strictly for the purpose of this cost analysis, DHS needed to pick a specific "point-estimate" in order to approximate the costs of the IFR.

[1] The SVA and SSP include all costs, including the cost of the time of the SSO.

[2] Every other year, 100% of facilities will review/update their SVAs and SSPs.

[3] In update years, this includes the cost of updating the Top-Screen information in CSAT.

6.8 Total national cost for chemical facility security

The national cost for the IFR is the sum of the individual costs estimated for each facility affected. National cost is discounted to its PV at 7 percent over a three year period (2007-2009). The total national and annual cost is presented in Table 43 (primary estimate), Table 44 (low population estimate) and Table 45 (high population estimate).

Table 43. Total National PV Cost for Facility Security, in $ millions (2006-2009, 7 percent discount rate), primary population estimate (5,000 high-risk facilities)

		2006	2007	2008	2009	Total
Tier1	A	$0	$11	$231	$236	$477
	B	0	11	103	102	216
	C	0	2	19	18	39
Tier2	A	0	20	351	363	733
	B	0	6	60	62	128
	C	0	7	52	52	110
Tier3	A	0	28	211	474	713
	B	0	26	116	237	379
	C	0	10	66	117	193
Tier4	A	0	15	25	81	120
	B	0	41	66	138	245
	C	0	18	34	74	126
Tier1	Theft	0	1	5	5	11
Tier2	Theft	0	17	109	116	241
Tier3	Theft	0	22	123	249	394
Tier4	Theft	0	29	49	140	218
Top-Screen		0	110	21	5	136
Reclassified High Risk*		0	0	11	0	11
Hearings & Appeals		0.0	0.0	0.1	0.0	0.1
TSDB Appeals		0	0	4	4	8
Total		**$0**	**$374**	**$1,655**	**$2,471**	**$4,500**
PV Total		**$0**	**$326**	**$1,351**	**$1,885**	**$3,562**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
***Please note that in 2009 costs stop accruing in October as that is the end of the authorization period set forth in section 550.
Note: Totals may not sum due to independent rounding.

Table 44. Total National PV Cost for Facility Security, in $ millions (2006-2009, 7 percent discount rate), low population estimate (1,500 high-risk facilities)

		2006	2007	2008	2009	Total
Tier 1	A	$0	$3	$66	$67	$136
	B	0	3	29	29	61
	C	0	1	5	5	11
Tier 2	A	0	6	106	109	221
	B	0	2	18	18	38
	C	0	2	15	15	33
Tier 3	A	0	9	64	143	215
	B	0	8	35	71	113
	C	0	3	20	35	58
Tier 4	A	0	4	8	24	36
	B	0	12	20	41	73
	C	0	5	10	22	38
Tier 1	Theft	0	1	5	5	11
Tier 2	Theft	0	5	33	35	73
Tier 3	Theft	0	6	37	75	118
Tier 4	Theft	0	9	15	42	66
Top-Screen		0	110	21	5	136
Reclassified High Risk*		0	0	11	0	11
Hearings & Appeals		0.0	0.0	0.1	0.0	0.1
TSDB Appeals		0	0	1	1	2
Total		**$0**	**$189**	**$517**	**$744**	**$1,450**
PV Total		**$0**	**$165**	**$422**	**$567**	**$1,155**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
***Please note that in 2009 costs stop accruing in October as that is the end of the authorization period set forth in section 550.
Note: Totals may not sum due to independent rounding.

Table 45. Total National PV cost for Facility Security, in $ millions (2006-2009, 7 percent discount rate), high population estimate (6,500 high-risk facilities)

		2006	2007	2008	2009	Total
Tier 1	A	$0	$14	$302	$309	$625
	B	0	14	135	133	281
	C	0	3	25	24	52
Tier 2	A	0	26	456	472	954
	B	0	8	79	82	168
	C	0	9	67	67	143
Tier 3	A	0	37	274	617	928
	B	0	34	151	307	492
	C	0	13	85	153	251
Tier 4	A	0	19	32	105	156
	B	0	54	85	179	318
	C	0	23	45	96	164
Tier 1	Theft	0	1	5	5	11
Tier 2	Theft	0	22	142	150	314
Tier 3	Theft	0	28	160	324	513
Tier 4	Theft	0	38	64	182	284
Top-Screen		0	110	21	5	136
Reclassified High Risk*		0	0	11	0	11
Hearings & Appeals		0.0	0.0	0.1	0.0	0.1
TSDB Appeals		0	0	5	5	10
Total		**$0**	**$453**	**$2,144**	**$3,214**	**$5,811**
PV Total		**$0**	**$395**	**$1,750**	**$2,452**	**$4,598**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
***Please note that in 2009 costs stop accruing in October as that is the end of the authorization period set forth in section 550.
Note: Totals may not sum due to independent rounding.

For purposes of comparison, we have estimated the national cost discounted to its PV at 7 percent over a ten year period (2006-2015). The total national and annual cost is presented in Table 46 (primary population estimate), Table 47 (low population estimate) and Table 48 (high population estimate).

Table 46. Total National PV Cost for Facility Security, in $ millions (2006-2015, 7 percent discount rate), primary population estimate (5,000 high-risk facilities)*,**

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tier 1	**A**	$0	$11	$231	$264	$127	$142	$141	$153	$152	$149	$1,370
	B	0	11	103	112	47	54	54	62	61	57	561
	C	0	2	19	21	11	12	12	14	14	13	119
Tier 2	**A**	0	20	351	393	150	174	177	195	198	189	1,846
	B	0	6	60	69	31	34	35	40	40	36	351
	C	0	7	52	60	39	40	41	47	48	41	374
Tier 3	**A**	0	28	211	496	130	148	143	164	212	157	1,689
	B	0	26	116	256	96	107	102	121	165	108	1,097
	C	0	10	66	131	63	69	65	80	112	68	664
Tier 4	**A**	0	15	25	89	38	40	39	38	59	39	383
	B	0	41	66	156	79	84	80	79	118	80	784
	C	0	18	34	85	45	49	46	45	77	46	445
Tier 1	**Theft**	0	1	5	6	3	3	3	4	4	3	31
Tier 2	**Theft**	0	17	109	135	86	89	92	105	107	95	836
Tier 3	**Theft**	0	22	123	268	95	109	101	133	205	112	1,167
Tier 4	**Theft**	0	29	49	153	59	66	60	59	114	60	650
Top-Screen		0	110	21	7	7	7	7	7	7	7	179
Reclassified High Risk***		0	0	11	0	0	0	0	0	0	0	11
Hearings & Appeals		0	0	0.1	0	0	0	0	0	0	0	0.1
TSDB Appeals		0	0	4	4	1	1	1	1	1	1	15
Total		**$0**	**$374**	**$1,655**	**$2,704**	**$1,107**	**$1,230**	**$1,200**	**$1,347**	**$1,695**	**$1,260**	**$12,572**
PV Total		**$0**	**$326**	**$1,351**	**$2,063**	**$790**	**$820**	**$747**	**$784**	**$922**	**$641**	**$8,443**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
** This ten year estimate reflects the compliance costs of these 5,000 facilities over the years 2006-2015. Such compliance costs include sustaining the required risk-based performance measures and submitting additional Top-screens, SVA's and SSP's in accordance with the IFR. In addition, this estimate includes Top-screens from facilities that could be potential new-entrants; however, due to a lack of data, we did not increase or decrease our estimate of 5,000 high-risk facilities.
***Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

Table 47. Total National PV Cost for Facility Security, in $ millions (2006-2015, 7 percent discount rate), low population estimate (1,500 high-risk facilities)*,**

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tier 1	**A**	$0	$3	$66	$75	$36	$40	$40	$43	$43	$42	$389
	B	0	3	29	31	13	15	15	17	17	16	158
	C	0	1	5	6	3	4	4	4	4	4	35
Tier 2	**A**	0	6	106	118	45	52	53	59	60	57	556
	B	0	2	18	20	9	10	10	12	12	11	104
	C	0	2	15	18	12	12	12	14	14	12	112
Tier 3	**A**	0	9	64	150	39	45	43	50	64	47	510
	B	0	8	35	77	29	32	30	36	49	32	328
	C	0	3	20	40	19	21	20	24	34	20	200
Tier 4	**A**	0	4	8	27	12	12	12	12	18	12	115
	B	0	12	20	47	24	25	24	24	35	24	235
	C	0	5	10	25	14	15	14	14	23	14	134
Tier 1	**Theft**	0	1	5	6	3	3	3	4	4	3	31
Tier 2	**Theft**	0	5	33	41	26	27	28	32	32	29	252
Tier 3	**Theft**	0	6	37	80	28	33	30	40	61	33	349
Tier 4	**Theft**	0	9	15	46	18	20	18	18	34	18	195
Top-Screen		0	110	21	7	7	7	7	7	7	7	179
Reclassified High Risk* **		0	0	11	0	0	0	0	0	0	0	11
Hearings & Appeals		0	0	0.1	0	0	0	0	0	0	0	0.1
TSDB Appeals		0	0	1	1	0	0	0	0	0	0	4
Total		**$0**	**$189**	**$517**	**$815**	**$336**	**$373**	**$364**	**$408**	**$513**	**$382**	**$3,898**
PV Total		**$0**	**$165**	**$422**	**$622**	**$240**	**$249**	**$227**	**$238**	**$279**	**$194**	**$2,635**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
** This ten year estimate reflects the compliance costs of these 1,500 facilities over the years 2006-2015. Such compliance costs include sustaining the required risk-based performance measures and submitting additional Top-screens, SVA's and SSP's in accordance with the IFR. In addition, this estimate includes Top-screens from facilities that could be potential new-entrants; however, due to a lack of data, we did not increase or decrease our estimate of 1,500 high-risk facilities.
***Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

Table 48. Total National PV Cost for Facility Security, in $ millions (2006-2015, 7 percent discount rate), high population estimate (6,500 high-risk facilities)*,**

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tier 1	**A**	$0	$14	$302	$346	$166	$186	$185	$200	$199	$196	$1,793
	B	0	14	135	146	61	71	70	81	80	74	731
	C	0	3	25	28	15	16	16	19	19	17	158
Tier 2	**A**	0	26	456	511	196	226	230	254	258	245	2,402
	B	0	8	79	90	41	45	46	52	53	47	461
	C	0	9	67	78	50	52	53	61	62	53	486
Tier 3	**A**	0	37	274	646	169	192	186	214	277	204	2,199
	B	0	34	151	333	125	139	132	157	214	141	1,426
	C	0	13	85	171	82	90	85	104	146	88	864
Tier 4	**A**	0	19	32	116	50	52	51	50	77	51	497
	B	0	54	85	202	103	109	104	103	153	104	1,018
	C	0	23	45	110	59	64	59	59	100	59	578
Tier 1	**Theft**	0	1	5	6	3	3	3	4	4	3	31
Tier 2	**Theft**	0	22	142	176	112	116	119	137	140	123	1,087
Tier 3	**Theft**	0	28	160	349	123	142	131	172	266	145	1,518
Tier 4	**Theft**	0	38	64	199	77	86	79	77	148	79	845
Top-Screen		0	110	21	7	7	7	7	7	7	7	179
Reclassified High Risk* **		0	0	11	0	0	0	0	0	0	0	11
Hearings & Appeals		0	0	0.1	0	0	0	0	0	0	0	0.1
TSDB Appeals		0	0	5	5	2	2	2	2	2	2	19
Total		**$0**	**$453**	**$2,144**	**$3,517**	**$1,439**	**$1,599**	**$1,559**	**$1,751**	**$2,204**	**$1,638**	**$16,303**
PV Total		**$0**	**$395**	**$1,750**	**$2,683**	**$1,026**	**$1,065**	**$971**	**$1,019**	**$1,199**	**$833**	**$10,941**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
** This ten year estimate reflects the compliance costs of these 6,500 facilities over the years 2006-2015. Such compliance costs include sustaining the required risk-based performance measures and submitting additional Top-screens, SVA's and SSP's in accordance with the IFR. In addition, this estimate includes Top-screens from facilities that could be potential new-entrants; however, due to a lack of data, we did not increase or decrease our estimate of 6,500 high-risk facilities.
***Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

7. Small Entity Analysis

At this time, DHS's preliminary estimate of the number of high risk chemical facilities that will be covered by the risk-based performance measures required by the interim final rule ranges from 1,500 to 6,500 chemical facilities. This estimate is DHS's best estimate based on currently available information. After chemical facilities fitting certain risk profiles complete a Top-Screen consequence assessment, DHS will have a much better understanding of how many and which specific chemical facilities will be deemed to be "high-risk" for the purposes of the interim final rule. Consequently, without the benefit of having the Top-Screen results and also knowing which risk-based tier a facility is assigned, it is very difficult to know which facilities will have to purchase security upgrades such as fences, perimeter lighting, and hire additional security guards. In addition, chemical facilities covered by the risk-based performance standards required by this rule will have a large degree of flexibility when choosing the specific security enhancements needed for compliance. DHS expects that chemical facility owners and/or operators will take full advantage of this flexibility in order to minimize the cost of this rule to their operations. These uncertainties make it very difficult to estimate the extent of the economic impact of this rule on small entities.

As explained previously in this Regulatory Assessment, the population of high-risk chemical facilities has been classified into two main categories: 1) Facilities at primary risk for loss of containment, damage, or injury. These chemical facilities are the ones assumed to be most at risk of an attack that would be meant to cause the deliberate loss of containment at the facility. Such an attack would result in adverse consequences for human life and health both onsite and well as offsite; and 2) Facilities at primary risk for theft and diversion. These chemical facilities manufacture, process, use, store or distribute chemicals that could be used to make a chemical weapon, improvised explosive device, weapon of mass effect or other explosive or toxic device.

7.1 Number of Small Entities at Risk for Loss of Containment, Damage, or Injury

Strictly for the purposes of analyzing the impact of this interim final rule on small entities, DHS has selected from the EPA RMP database a sample of 350 facilities that *may* be required to comply with the risk-based performance standards required by the rule. DHS researched these 350 facilities using *Reference USA* and *LexisNexis* and found detailed information (i.e. annual revenue, number of employees, and parent company information) for 326 (93%) of them.

Of the 326 facilities about which DHS was able to find detailed information, an analysis of the data indicates that 118 (36%) fit the Small Business Administration's definition of a small entity. If DHS assumes that the 24 companies for which no

information could be found are also small entities, the percentage of these facilities which are owned by small entities could be as high as 41%[20].

7.2 Types of Small Entities at Risk for Loss of Containment, Damage, or Injury

Table 49 presents the NAICS codes for the 118 facilities that were previously identified as small entities, the SBA definition for the relevant NAICS code, and summary statistics which show how many of the small entities are in each NAICS code.

Table 49. NAICS Codes, Descriptions, Definitions, Number and Percent for the 118 Small Entities Identified[21]

NAICS Code	Description	Small Entity Definition	Number of Small Entities	Percent of Small Entities
22121	Natural Gas Distribution	500 employees	1	0.8%
311511	Fluid Milk Manufacturing	500 employees	1	0.8%
311513	Cheese Manufacturing	500 employees	1	0.8%
31152	Ice Cream and Frozen Dessert Manufacturing	500 employees	1	0.8%
311612	Meat Processed from Carcasses	500 employees	1	0.8%
311991	Perishable Prepared Food Manufacturing	500 employees	1	0.8%
31323	Nonwoven Fabric Mills	500 employees	2	1.7%
321918	Other Millwork (including Flooring)	500 employees	2	1.7%
32411	Petroleum Refineries*	1,500 employees	14	11.9%
32511	Petrochemical Manufacturing	1,000 employees	3	2.5%
32512	Industrial Gas Manufacturing	1,000 employees	2	1.7%
325131	Inorganic Dye and Pigment Manufacturing	1,000 employees	2	1.7%
325132	Synthetic Organic Dye and Pigment Manufacturing	750 employees	1	0.8%
32518	Other Basic Inorganic Chemical Manufacturing	1,000 employees	1	0.8%
325181	Alkalis and Chlorine Manufacturing	1,000 employees	8	6.8%
325188	All Other Basic Inorganic Chemical Manufacturing	1,000 employees	15	12.7%
32519	Other Basic Organic Chemical Manufacturing	500 employees	3	2.5%
325199	All Other Basic Organic Chemical Manufacturing	1,000 employees	8	6.8%
325211	Plastics Material and Resin Manufacturing	750 employees	2	1.7%
325311	Nitrogenous Fertilizer Manufacturing	1,000 employees	3	2.5%
32532	Pesticide and Other Agricultural Chemical Manufacturing	500 employees	2	1.7%
325612	Polish and Other Sanitation Good Manufacturing	500 employees	1	0.8%
32599	All Other Chemical Product and Preparation Manufacturing	500 employees	1	0.8%
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	500 employees	11	9.3%
32614	Polystyrene Foam Product Manufacturing	500 employees	1	0.8%
32615	Urethane and Other Foam Product (except Polystyrene) Manufacturing	500 employees	1	0.8%
326199	All Other Plastics Product Manufacturing	500 employees	1	0.8%
33131	Alumina and Aluminum Production and Processing	1,000 employees	1	0.8%
331314	Secondary Smelting and Alloying of Aluminum	750 employees	2	1.7%
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	750 employees	1	0.8%

[20] 41% is calculated by (118 + 24)/350.
[21] For those facilities that are a subsidiary of another company the information presented in Table 48 represents the parent company information.

332811	Metal Heat Treating	750 employees	1	0.8%
332919	Other Metal Valve and Pipe Fitting Manufacturing	500 employees	1	0.8%
335912	Primary Battery Manufacturing	1,000 employees	1	0.8%
339999	All Other Miscellaneous Manufacturing	500 employees	1	0.8%
42459	Other Farm Product Raw Material Merchant Wholesalers	100 employees	4	3.4%
424690	Other Chemical and Allied Products Merchant Wholesalers	100 employees	3	2.5%
42471	Petroleum Bulk Stations and Terminals	100 employees	2	1.7%
42491	Farm Supplies Merchant Wholesalers	100 employees	1	0.8%
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers	< $6.5M annual rev.	2	1.7%
49311	General Warehousing and Storage	< $23.5M annual rev.	1	0.8%
49312	Refrigerated Warehousing and Storage	< $23.5M annual rev.	3	2.5%
49319	Other Warehousing and Storage	< $23.5M annual rev.	1	0.8%
56179	Other Services to Buildings and Dwellings	< $6.5M annual rev.	2	1.7%
62422	Community Housing Services	< $6.5M annual rev.	1	0.8%
Total			**118**	**100.0%**

Detail may not calculate to total due to independent rounding.

*NAICS code 324110 - For purposes of Government procurement, the petroleum refiner must be a concern that has no more than 1,500 employees nor more than 125,000 barrels per calendar day total Operable Atmospheric Crude Oil Distillation capacity. Capacity includes owned or leased facilities as well as facilities under a processing agreement or an arrangement such as an exchange agreement or a throughput. The total product to be delivered under the contract must be at least 90 percent refined by the successful bidder from either crude oil or bona fide feedstocks.

Table 50 displays the break out of the 118 identified small entities by revenue.

Table 50. Percentage of Small Entities by Revenue

Revenue	Number of Small Entities	Percent of Small Entities
$0 - $999,999	11	9.3%
$1,000,000 - $4,999,999	14	11.9%
$5,000,000 - $9,999,999	12	10.2%
$10,000,000 - $19,999,999	15	12.7%
$20,000,000 - $49,999,999	23	19.5%
$50,000,000 - $99,999,999	9	7.6%
$100,000,000 - $999,999,999	31	26.3%
> $1Billion	3	2.5%
Total	**118**	**100.0%**

7.3 Types of Small Entities at Risk for Theft and Diversion

In the previous section, DHS discussed facilities at primary risk for loss of containment, damage, or injury and used information from the RMP database as a basis to determine these facilities; however, other facilities that are at primary risk for theft and diversion may not be in the RMP database. The best information that DHS could provide for this analysis to show the estimate of the types of small entities

at primary risk for theft and diversion is a list of the primary NAICS codes from which DHS expects the theft and diversion facility population to be drawn. In order to determine these primary NAICS codes, DHS consulted with its own industry experts.

Please note that the list of NAICS codes shown in Table 51 may not be an exhaustive list of the universe of industry types that may be included in this category, but rather is a list of the major industries that are thought to include facilities at primary risk for theft and diversion. There may be facilities that are listed in other NAICS codes that are considered at risk for theft and diversion as well.

Table 51. Primary NAICS Codes, Descriptions and Definitions for Small Entities in the Theft and Diversion Category

NAICS Code	Description	Small Entity Definition
115112	Soil Preparation, Planting, and Cultivating	< $6.5M annual rev.
2122	Metal Ore Mining	500 employees
325110	Petrochemical Manufacturing	1,000 employees
32512	Industrial Gas Manufacturing	1,000 employees
325131	Inorganic Dye and Pigment Manufacturing	1,000 employees
325132	Synthetic Organic Dye and Pigment Manufacturing	750 employees
325181	Alkalies and Chlorine Manufacturing	1,000 employees
325182	Carbon Black Manufacturing	500 employees
325188	All Other Basic Inorganic Chemical Manufacturing	1,000 employees
325191	Gum and Wood Chemical Manufacturing	500 employees
325192	Cyclic Crude and Intermediate Manufacturing	750 employees
325193	Ethyl Alcohol Manufacturing	1,000 employees
325199	All Other Basic Organic Chemical Manufacturing	1,000 employees
325211	Plastics Material and Resin Manufacturing	750 employees
325212	Synthetic Rubber Manufacturing	1,000 employees
325221	Cellulosic Organic Fiber Manufacturing	1,000 employees
325222	Noncellulosic Organic Fiber Manufacturing	1,000 employees
325311	Nitrogenous Fertilizer Manufacturing	1,000 employees
325312	Phosphatic Fertilizer Manufacturing	500 employees
325314	Fertilizer (Mixing Only) Manufacturing	500 employees
32532	Pesticide and Other Agricultural Chemical Manufacturing	500 employees
32552	Adhesive Manufacturing	500 employees
32592	Explosives Manufacturing	750 employees
3312	Steel Product Manufacturing from Purchased Steel	1,000 employees
331311	Alumina Refining	1,000 employees
331312	Primary Aluminum Production	1,000 employees
331314	Secondary Smelting and Alloying of Aluminum	750 employees
331315	Aluminum Sheet, Plate, and Foil Manufacturing	750 employees
331316	Aluminum Extruded Product Manufacturing	750 employees
331319	Other Aluminum Rolling and Drawing	750 employees
331411	Primary Smelting and Refining of Copper	1,000 employees
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	750 employees
331421	Copper Rolling, Drawing, and Extruding	750 employees
331422	Copper Wire (except Mechanical) Drawing	1,000 employees
331423	Secondary Smelting, Refining, and Alloying of Copper	750 employees

33149	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding, and Alloying	750 employees
3315	Foundries	500 employees
334411	Electron Tube Manufacturing	750 employees
334412	Bare Printed Circuit Board Manufacturing	500 employees
334413	Semiconductor and Related Device Manufacturing	500 employees
334414	Electronic Capacitor Manufacturing	500 employees
334415	Electronic Resistor Manufacturing	500 employees
334416	Electronic Coil, Transformer, and Other Inductor Manufacturing	500 employees
334417	Electronic Connector Manufacturing	500 employees
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	500 employees
334419	Other Electronic Component Manufacturing	500 employees
4245	Farm Product Raw Material Merchant Wholesalers	100 employees
42469	Other Chemical and Allied Products Merchant Wholesalers	100 employees
42491	Farm Supplies Merchant Wholesalers	100 employees

7.4 Numbers of Small Entities at Risk for Theft and Diversion

After identifying the primary NAICS codes and their corresponding size standards, DHS utilized the Census Bureau's industry statistics to develop a possible distribution of the number of firms by employment size within the identified industries. This allowed the identification of the number of firms within an industry below a certain employment threshold, which in turn permitted an estimate of the number of small entities within the industry, as defined by the SBA. Table 52 presents the types of small entities at primary risk for theft and diversion that the rule may affect.

Table 52. Number of Entities by NAICS Codes by Employee Size for Facilities in the Theft & Diversion Category[22]

NAICS Code	Industry Title	Number of Entities by Employee Size							
		0	1 to 99	100 to 499	500 to 749	750 to 999	1,000 to 1,499	1,500+	Total
2122	Metal Ore Mining	470	3,608	232	32	26	22	97	**4,487**
325110	Petrochemical Manufacturing	-	19	3	2	-	3	12	**39**
32512	Industrial Gas Manufacturing	9	48	10	2	1	2	12	**84**
325131	Inorganic Dye and Pigment Manufacturing	1	44	6	-	-	1	11	**63**
325132	Synthetic Organic Dye and Pigment Manufacturing	4	63	9	3	-	2	12	**93**
325181	Alkalies and Chlorine Manufacturing	1	19	2	1	-	-	7	**30**
325182	Carbon Black Manufacturing	1	3	3	-	-	1	3	**11**
325188	All Other Basic Inorganic Chemical Manufacturing	18	257	50	8	4	4	56	**397**
325191	Gum and Wood Chemical Manufacturing	6	30	4	-	-	-	5	**45**
325192	Cyclic Crude and Intermediate Manufacturing	1	9	2	-	-	3	11	**26**
325193	Ethyl Alcohol Manufacturing	7	61	4	1	-	1	6	**80**
325199	All Other Basic Organic Chemical Manufacturing	17	291	62	12	4	8	79	**473**
325211	Plastics Material and Resin Manufacturing	30	353	64	8	8	7	69	**539**
325212	Synthetic Rubber Manufacturing	13	84	9	6	-	1	18	**131**
325221	Cellulosic Organic Fiber Manufacturing	1	5	1	3	-	-	1	**11**
325222	Noncellulosic Organic Fiber Manufacturing	3	35	13	1		1	19	**72**
325311	Nitrogenous Fertilizer Manufacturing	11	93	5	1	1	2	8	**121**
325312	Phosphatic Fertilizer Manufacturing	2	13	4	-	-	3	7	**29**
325314	Fertilizer (Mixing Only) Manufacturing	20	271	26	3	-	3	17	**340**
32532	Pesticide and Other Agricultural Chemical Manufacturing	13	140	22	2	-	2	16	**195**
32552	Adhesive Manufacturing	17	340	41	9	3	3	37	**450**
32592	Explosives Manufacturing	3	33	8	2	-	1	6	**53**
3312	Steel Product Manufacturing from Purchased Steel	45	381	86	18	4	10	44	**588**
331311	Alumina Refining	-	5	1	1	-	-	3	**10**
331312	Primary Aluminum Production	9	32	4	1	-	-	7	**53**
331314	Secondary Smelting and Alloying of Aluminum	11	83	19		1	2	8	**124**
331315	Aluminum Sheet, Plate, and Foil Manufacturing	2	52	9	1	-	2	11	**77**
331316	Aluminum Extruded Product Manufacturing	2	64	39	6	2	4	15	**132**
331319	Other Aluminum Rolling and Drawing	5	53	10	2	-	-	7	**77**
331411	Primary Smelting and Refining of Copper	-	6	-	1	-	-	3	**10**
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	9	103	15	-	-	4	15	**146**
331421	Copper Rolling, Drawing, and Extruding	7	48	12	2	-	1	11	**81**
331422	Copper Wire (except Mechanical) Drawing	2	48	12	3	-	1	13	**79**
331423	Secondary Smelting, Refining, and Alloying of Copper	1	18	8	-	-	-	2	**29**
33149	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, Extruding, and Alloying	20	360	35	6	2	7	35	**465**
3315	Foundries	86	1,609	246	23	10	11	80	**2,065**
334411	Electron Tube Manufacturing	3	57	7	1	-	2	9	**79**
334412	Bare Printed Circuit Board Manufacturing	41	653	59	6	4	4	24	**791**
334413	Semiconductor and Related Device Manufacturing	52	625	67	12	10	12	58	**836**
334414	Electronic Capacitor Manufacturing	2	54	9	5	1	1	5	**77**
334415	Electronic Resistor Manufacturing	-	36	11	2	-	2	4	**55**
334416	Electronic Coil, Transformer, and Other Inductor Manufacturing	12	260	28	3	4	1	6	**314**
334417	Electronic Connector Manufacturing	10	189	33	5	4	-	21	**262**
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	44	592	125	6	5	6	39	**817**
334419	Other Electronic Component Manufacturing	61	1,066	126	15	7	10	51	**1,336**
4245	Farm Product Raw Material Merchant Wholesalers	298	3,888	153	13	5	7	27	**4,391**
42469	Other Chemical and Allied Products Merchant Wholesalers	538	5,706	183	17	8	16	118	**6,586**
42491	Farm Supplies Merchant Wholesalers	389	4,333	187	13	5	13	36	**4,976**
	Total	**2,297**	**26,140**	**2,064**	**258**	**119**	**186**	**1,161**	**32,225**

[22] It is important to note that estimates shown in tables 52 53 do not represent the number of regulated facilities. Instead, the figures display the number of firms in NAICS codes that may be affected by the proposed rule.

In addition to the employee size standards listed in Table 52, the SBA also defines some NAICS categories by the amount of revenue earned. There was only one NAICS code in the theft and diversion category that the SBA defines by revenue. It is listed below in Table 53.

Table 53. Number of Entities by NAICS Codes by Revenue Receipts for Facilities in the Theft & Diversion Category

NAICS Code	Industry Title	Number of Entities by Receipts								
		$0 to $99,999	$100,000 to $499,999	$500,000 to $999,999	$1,000,000 to $4,999,999	$5,000,000 to $9,999,999	$10,000,000 to $49,999,999	$50,000,000 to $99,999,999	$100,000,000+	Total
115112	Soil preparation, planting, & cultivating	509	992	413	395	30	15	2	69	**2,425**

In the course of our research, DHS has determined that 32,423 (94%), of the facilities in the NAICS codes from which it expects the theft and diversion facility population to be drawn may be classified as small entities.[23]

After considering the information explained above and the compliance costs explained throughout this Regulatory Assessment, we have determined that the rule may have a significant economic impact on a substantial number of small entities.

[23] The large percentage of small entities in the theft and diversion category may be a result of the way the Census Bureau classifies the firms in their survey for the Statistics of US Businesses. In this survey, a firm is defined as "a business organization consisting of one or more domestic establishments in the same state and industry that were specified under common ownership or control." Thus, if a firm has other facilities listed in different industries or in other states they would be counted separately. For more information on the Census Bureau's definition of a firm please refer to: **http://www.census.gov/epcd/susb/susbdefs.htm#firm.**

8. OMB Accounting Statement

As required by OMB Circular A-4 (available at www.whitehouse.gov/omb/circulars/index.html), DHS has prepared an accounting statement showing the classification of the costs and benefits associated with this rule. Table 54 provides an estimate of the dollar amount of these costs and benefits expressed in 2007 dollars, at three percent and seven percent discount rates. DHS estimates the cost of this rule will be approximately $1.357 billion annualized (7 percent discount rate) and approximately $1.436 billion annualized (3 percent discount rate. Non-quantified benefits are reduced vulnerability.

Table 54. OMB Accounting Statement of Annualized Costs and Benefits (2006-2009)

	3% discount rate			7% discount rate		
	Primary Estimate	Minimum Estimate	Maximum Estimate	Primary Estimate	Minimum Estimate	Maximum Estimate
COSTS						
Annualized monetized costs	$1,436 million	$1,006 million	$1,747 million	$1,357 million	$951 million	$1,651 million
Annualized quantified, but un-monetized costs		None			None	
Qualitative (un-quantified) costs		None			None	
BENEFITS						
Annualized monetized benefits		None			None	
Annualized quantified, but un-monetized benefits		None			None	
Qualitative (un-quantified) benefits		Reduced vulnerability of high-risk chemical facilities to a terrorist attack			Reduced vulnerability of high-risk chemical facilities to a terrorist attack	

Table 55 presents the national cost for different elements of implementing the IFR for facilities (these costs are not discounted).

Table 55. Percentage of Total National Initial and Annual Cost by Element of Compliance over 3 years (2006-2009) (not discounted)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Capital Costs	$2,674	59%	$800	55%	$3,481	60%
Guards	473	11%	141	10%	617	11%
SV/SSP Costs	114	3%	34	2%	148	3%
SSO	838	19%	252	17%	1,090	19%
Personnel and Readiness	245	5%	73	5%	318	5%
Top-Screen*	136	3%	136	9%	136	2%
Reclassified High Risk Facilities**	11	0.3%	11	0.8%	11	0.2%
SSP Hearings & Appeals	0.1	0.002%	0.1	0.005%	0.1	0.001%
TSDB Appeals	8	0.2%	2	0.2%	10	0.2%
Total	**$4,500**	**100%**	**$1,450**	**100%**	**$5,811**	**100%**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

Table 56. Percentage of Total National Initial and Annual Cost by Element of Compliance over 10 years (2006-2015) (not discounted)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Capital Costs	$4,821	38%	$1,443	37%	$6,274	38%
Guards	2,998	24%	894	23%	3,905	24%
SV/SSP Costs	277	2%	83	2%	361	2%
SSO	2,972	24%	893	23%	3,865	24%
Personnel and Readiness	1,299	10%	390	10%	1,689	10%
Top-Screen*	179	1%	179	5%	179	1%
Reclassified High Risk Facilities**	11	0.1%	11	0.3%	11	0.1%
SSP Hearings & Appeals	0.1	0.001%	0.1	0.002%	0.1	0.000%
TSDB Appeals	15	0.1%	4	0.1%	19	0.1%
Total	**$12,572**	**100%**	**$3,898**	**100%**	**$16,303**	**100%**

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

Table 57 presents the national costs for the different tiers of implementing the interim final rule. National cost is discounted to its PV at 7 percent (2006-2009).

Table 57. Summary of Estimated Costs by Tier in $millions (2006-2009, 7 percent discount rate)

	Primary estimate (5,000 facilities)		Low population estimate (1,500 facilities)		High population estimate (6,500 facilities)	
	$ million	Percent of total	$ million	Percent of total	$ million	Percent of total
Tier 1	$589	17%	$173	15%	$768	17%
Tier 2	961	27%	289	25%	1,252	27%
Tier 3	1,318	37%	396	34%	1,714	37%
Tier 4	562	16%	169	15%	730	16%
Top Screen*	117	3%	117	10%	117	3%
Reclassified High Risk Facilities**	9	0%	9	1%	9	0%
SSP Hearings & Appeals	<1	0%	<1	0%	<1	0%
TSDB Appeals	6	0%	2	0%	8	0%
Total	**$3,562**	**100%**	**$1,155**	**100%**	**$4,598**	**100%**
Annualized Cost	**$1,357**		**$440**		**$1,752**	

* Includes the cost of the Top-Screen for the initial 50,000 facilities. This cost does not vary with the different assumptions for the high risk facility population.
**Reclassified High Risk Facilities is the cost of the Security Vulnerability Assessments conducted by facilities that were preliminarily determined to be high risk after the completion of the Top-Screen, but after completion of the SVA, these facilities were determined NOT to be high-risk.
Note: Totals may not sum due to independent rounding.

9. Results of the Monte Carlo Simulation

OMB Circular A-4 requires a formal quantitative treatment of uncertainty for rules expected to have costs or benefits exceeding $1 billion in any 1 year[24]. DHS estimates the direct, quantified cost of chemical facility anti-terrorism standards to average $1.4 billion per year during the 3-year authorization period. In addition to the high- and low-population scenario estimates presented previously, DHS has also developed a Monte Carlo analysis to specifically address variance and uncertainty in the cost estimate.

Monte Carlo analysis is used to generate values for the uncertain variables by mathematically manipulating distributions, rather than point estimates, of those variables. Because there are so many assumptions and variables in this analysis, DHS conducted a preliminary Monte Carlo analysis to more formally characterize the inherent uncertainty in our resulting estimates. The results of the analysis are presented here. A full description of the variables modeled and the forecasts produced are presented in the appendices.

[24] For a discussion of appropriate statistical techniques to determine probability distributions of relevant outcomes see Office of Management and budget. 2003. "Circular A-4" (Guidance to Federal agencies on the development of regulatory analysis.) September 17, 2003. Page 41.

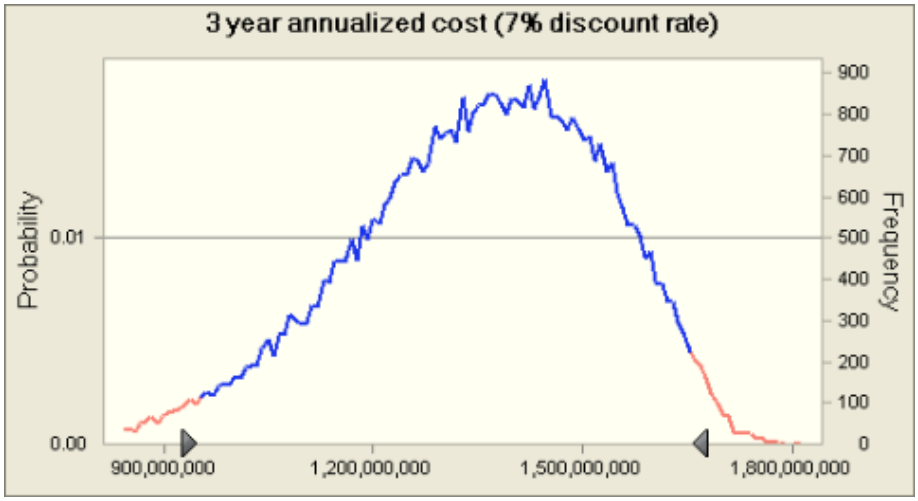
For the most likely estimate DHS constructed distributions around the population of facilities, each of the unit costs, the percentage of facilities that will need to purchase each item and the quantities of items purchased, i.e., the number of guards. To represent the population of facilities, DHS used a beta distribution with a mean of 5,000, maximum of 6,500 and minimum of 1,500. For each of the unit costs and quantities, a normal distribution was used. Normal distributions were also used for the percentages; however, the tails were truncated at 0% and 100% where necessary. Estimates are given for the 5^{th} and 95^{th} percentile. DHS conducted 50,000 trials in all simulations.

The results of the simulation for the average three-year cost (discounted at 7%) are presented in Tables 58 and 59. At a 7% discount rate, the results of the Monte Carlo analysis show that the annual cost of the chemical facility anti-terrorism standards are between $951 million and $1,651 million at a 95% confidence interval. Using a 3% discount rate, the annual cost of the chemical facility anti-terrorism standards are between $1,006 million and $1,747 million at a 95% confidence interval.

Table 58. Results of the Monte Carlo Simulation to Estimate the Annualized Cost over three years, discounted at 7%

Summary:

Certainty level is 95.000%
Certainty range is from 951,410,364 to 1,650,541,839
Entire range is from 605,897,143 to 1,816,142,080
Base case is 1,357,496,779



Statistics:	Forecast values
Trials	50,000
Mean	1,348,229,552
Median	1,364,352,740
Mode	---
Standard Deviation	182,261,139
Variance	33,219,122,925,741,600
Skewness	-0.4496
Kurtosis	2.88
Coeff. of Variability	0.1352
Minimum	605,897,143
Maximum	1,816,142,080
Range Width	1,210,244,937
Mean Std. Error	815,097

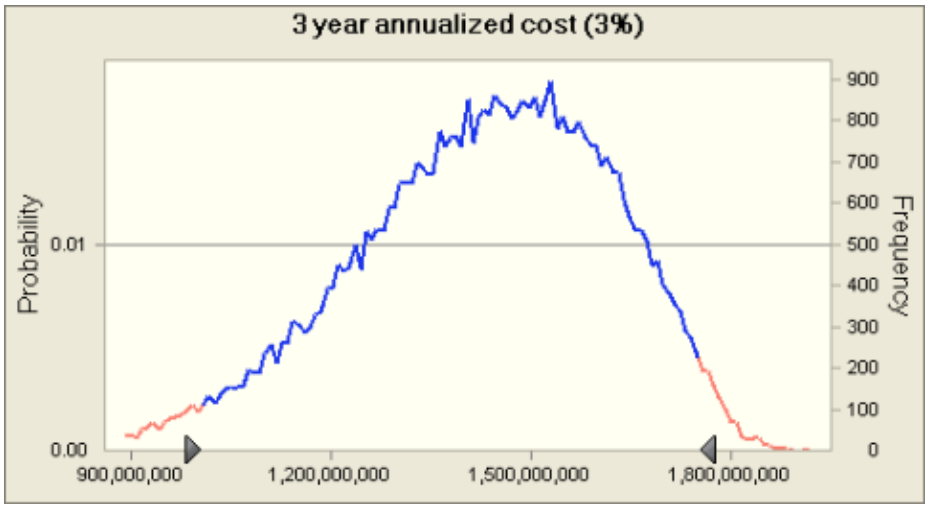
Percentiles:	Forecast values
0%	605,897,143
10%	1,099,846,435
20%	1,194,544,626
30%	1,259,497,552
40%	1,314,625,691
50%	1,364,352,740
60%	1,412,247,649
70%	1,459,699,028
80%	1,511,158,001
90%	1,573,467,042
100%	1,816,142,080

Table 59. Results of the Monte Carlo Simulation to Estimate the Annualized Cost over three years, discounted at 3%

Forecast: 3 year annualized cost (3%)

Summary:

Certainty level is 95.000%
Certainty range is from 1,005,851,928 to 1,746,661,698
Entire range is from 639,447,259 to 1,922,292,935
Base case is 1,436,141,601



Statistics:	Forecast values
Trials	50,000
Mean	1,426,235,412
Median	1,443,292,610
Mode	---
Standard Deviation	193,133,750
Variance	37,300,645,294,516,500
Skewness	-0.4493
Kurtosis	2.88
Coeff. of Variability	0.1354
Minimum	639,447,259
Maximum	1,922,292,935
Range Width	1,282,845,676
Mean Std. Error	863,720

Percentiles:	Forecast values
0%	639,447,259
10%	1,163,007,855
20%	1,263,266,511
30%	1,332,300,223
40%	1,390,615,233
50%	1,443,292,610
60%	1,494,070,500
70%	1,544,361,694
80%	1,598,887,648
90%	1,664,985,825
100%	1,922,292,935

10. Benefits of Risk Based Performance Standards in the Chemical Facility Anti-Terrorism Standards

This interim final rule allows DHS to implement Section 550 of the Homeland Security Appropriations Act of 2007. The first sentence of section 550 mandates the Secretary to issue interim final regulations establishing risk-based performance standards requiring the performance of vulnerability assessments and the development and implementation of site security plans. Section 550 of the Act establishes the parameters of the Federal government's first regulatory program to secure chemical facilities against possible terrorist attack.

The threat of a terrorist attack against high-risk chemical facilities is real. However, due to the economics of externalities, the free market may not provide adequate incentives for chemical facilities to make a socially optimal investment in the full range of measures that would reduce the probability of a successful terrorist attack. Externalities are a cost or benefit from an economic transaction experienced by parties "external" to the transaction. In the case of chemical facilities, since the consequences of an attack or other security incident may be significantly larger than what would be suffered by the owner of the facility itself, the private market may not generally provide the incentive for profit-maximizing firms to unilaterally spend the socially optimal amount of resources to prevent or mitigate a terrorist attack. Since companies nevertheless will likely suffer serious consequences in the case of a terrorist attack, many certainly have invested significant resources in implementing security measures, and this analysis recognizes those resource expenditures. In a competitive marketplace, however, a firm will not normally choose to make some additional investment in security over their privately optimal amount, since they would consequently be choosing to increase its cost of production and would be at a disadvantage when competing with companies that have chosen not to make a similar investment in security.

10.1 Need for Increased Security at High-Risk Chemical Facilities

There is much publicly-available information that indicates an attack on a chemical facility is a credible threat with dire consequences:

- According to the Government Accountability Office, experts agree that the nation's chemical facilities present an attractive target for terrorists intent on causing massive damage. Many facilities house toxic chemicals that could become airborne and drift to surrounding communities if released or could be stolen and used to create a weapon capable of causing harm. Terrorist attacks involving the theft or release of certain chemicals could have a significant impact on the health and safety of millions of Americans. The disaster at Bhopal, India in 1984, when methyl isocyanate gas—a highly toxic chemical—leaked from a tank, reportedly killing about

3,800 people and injuring anywhere from 150,000 to 600,000 others, illustrates the potential threat to public health from a chemical release.[25]

- The Department of Justice has concluded that the risk of terrorists attempting in the foreseeable future to cause an industrial chemical release is both real and credible. Terrorists or other criminals are likely to view the potential of a chemical release from an industrial facility as a relatively attractive means to cause mass casualties to the populace and/or large scale damage to property. DOJ notes that there have been successful efforts by foreign militaries and certain terrorist groups indigenous to other countries to cause releases from industrial facilities using bombs. Those efforts have in effect converted the facilities into makeshift WMD. Some of these releases have inflicted damage on the surrounding communities. Moreover, the evacuations that were triggered by the attempted and successful releases of industrial chemicals produced panic and disruption among the targeted population. These are precisely the goals of a terrorist.[26]

- In April 27, 2005, testimony before the Senate Committee on Homeland Security and Governmental Affairs regarding the vulnerability of America to a chemical attack, a Brookings Institution Visiting Fellow testified. The testimony stated that "of all the various remaining civilian vulnerabilities in America today, one stands alone as uniquely deadly, pervasive, and susceptible to a terrorist attack: toxic-inhalation-hazard (TIH) industrial chemicals, such as chlorine, ammonia, phosgene, methyl bromide, hydrochloric and various other acids." In addition, the testimony indicated, "the casualty potential of a terrorist attack against a large TIH chemical container near a population center is comparable to that of a fully successful terrorist employment of an improvised nuclear device or effective biological weapon. The key difference is that TIH chemical containers are substantially easier to attack than improvised nuclear devices or effective biological weapons are to acquire or fabricate." [27]

- In April 27, 2005, testimony before the Senate Committee on Homeland Security and Governmental Affairs regarding the vulnerability of America to a chemical attack, a Senior Fellow for National Security Studies at the Council on Foreign Relations testified. The testimony stated "Of the carefully selected potential targets that al Qaeda or its imitators might seek to attack, the chemical industry should be at the top of the list. There are hundreds of chemical facilities within the United States that represent the military equivalent of a poorly guarded arsenal of weapons of mass destruction."[28]

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[25] GAO, *Homeland Security: Federal and Industry Efforts Are Addressing Security Issues at Chemical Facilities, but Additional Action is Needed*, GAO-05-631T (Washington, D.C.: April 2005).
[26] *Department of Justice Assessment of the Increased Risk of Terrorist or Other Criminal Activity Associated With Posting Off-Site Consequence Analysis Information on the Internet*, April 18, 2000.
[27] Statement of Richard A. Falkenrath, Visiting Fellow, The Brookings Institution, before the United States Committee on Homeland Security and Governmental Affairs (April 27, 2005).
[28] Statement of Stephen E. Flynn, Ph.D, Jeane J. Kirkpatrick Senior Fellow for National Security Studies, Council on Foreign Relations, before the United States Committee on Homeland Security and Governmental Affairs (April 27, 2005).

● A recent Congressional Research Service Report discussed trends in chemical terrorism and stated evidence that U.S. chemical facilities may be used by terrorists to gain access to chemicals exists. One of the 1993 World Trade Center bombers, Nidal Ayyad, became a naturalized U.S. citizen and worked as a chemical engineer in the chemical industry, from which he used company stationery to order chemical ingredients to make the bomb."[29]

● Information contained in the Congressional Record states that U.S. chemical trade publications were found in one of the caves where Osama bin Laden had hidden.[30]

10.2 Qualitative Benefits of the Risk-Based Performance Standards

As explained previously, Section 550 of the Act requires the Secretary of Homeland Security to promulgate ''interim final regulations establishing risk-based performance standards for security of chemical facilities * * *." Section 27.230 establishes these standards. Below is a discussion of the qualitative benefits of these risk-based performance standards:

● By securing and monitoring the perimeter of the facility, site personnel are better able to detect, delay, and respond to individuals or groups who seek unauthorized access to the site or its restricted areas. A well-secured perimeter deters intruders from seeking to gain access. By limiting access through control points, the facility can more easily and effectively control who enters and leaves the site. Additionally, securing and monitoring restricted areas or potentially critical targets within the facility reduces the likelihood of theft of chemicals because adversaries risk observation arriving and leaving the premises. Control of gates by guards or observation of the perimeter allows facility personnel to know who is entering and leaving the site and in what vehicles. Access control points permit the facility to check persons and vehicles seeking entrance to the site and confirm their legitimate business.

● Controlling access to the site including the screening and/or inspection of individuals and vehicles as they enter and exit the facility serves to deter and detect unauthorized introduction or removal of substances and devices that may cause a dangerous chemical reaction, explosion, or other release to harm facility personnel or the surrounding community. A regular system of identification checks will help guards and other facility personnel recognize those personnel authorized to be on the site and identify those individuals who should not be granted access.

● Deterring vehicles from entering the facility or restricted access areas will reduce the likelihood that an adversary will detonate a vehicle-borne improvised explosive device inside the facility. Appropriate methods of deterring vehicles from

[29] CRS Report for Congress, *Chemical Facility Security*, Updated August 2, 2006.
[30] Bond, Christopher. Statement on S.2579. *Congressional Record*, Daily Edition, June 5, 2002, p.S5044.

unauthorized entry provide additional time for local law enforcement response or otherwise delay or prevent the vehicle from entering the site to cause harm.

● Securing and monitoring the shipping and receiving of hazardous chemicals will improve inventory control, product stewardship and security against theft, diversion and tampering. In addition, improved inventory control and control of transportation containers on site decreases the likelihood that a foreign substance could be introduced into feedstocks, incidental chemicals, or products leaving the site that could later react with the chemical to cause a significant on- or off-site reaction to damage process equipment or cause a release of a hazardous material to harm onsite personnel or the community.

● Deterring the theft or possible diversion of potentially hazardous chemicals will prevent loss of chemicals from the site. Such measures provide security benefits as well as improving inventory controls especially for chemicals that can be used directly as a chemical weapon or can be used to produce such a weapon.

● Deterring insider sabotage prevents the facility's own property and activities from being used by a potential terrorist against the facility. Examining the background of employees or contractors who may be planning acts of sabotage assists in preventing an *in situ* release of hazardous chemicals, damage to process units manufacturing chemicals or tampering with chemicals that could cause an offsite impact. Ascertaining that visitors and contractors have legitimate business onsite and are escorted when necessary increases the control of the site in general and reduces the likelihood of sabotage or theft.

● The deterrence of cyber sabotage will benefit the facility by preventing unauthorized onsite or remote access to critical process controls, site security, business systems, or SCADA systems (if significant consequences can be generated by the manipulation of the process controls/ systems). Appropriate controls will allow the detection of unauthorized access and unauthorized modification of information (hacking).

● Developing and exercising an emergency plan to respond to security incidents internally and with local law enforcement and first responders (i.e., fire, police, EMTs) benefits the facility by preparing it to take quick and decisive action in the event of an attack or other breach of security. Establishing relationships with local law enforcement improves responder understanding of the layout and hazards associated with the facility and strengthens relationships with the community.

● Maintaining effective monitoring, communications and warning systems allows the facility to notify internal personnel and local responders in a timely manner about security incidents. Regular tests, repairs and improvements to the warning and communications system increase the reliability of such systems and will improve response time.

● When the facility provides proper security training, exercises and drills, facility personnel are better able to respond to suspicious behavior, attempts to enter or attack a facility, or other malevolent acts by insiders or intruders. Well trained personnel who practice how to react can more effectively detect and delay intruders and provide increased measures of deterrence against unauthorized acts. Establishing relationships with local law enforcement improves responder understanding of the layout and hazard associated with the facility and strengthens relationships with the community.

● The ability to escalate the levels of security measures for periods of elevated threat will provide the facility with the capacity to increase security measures to better protect against known increased threats or generalized increased threat levels declared by the federal government. By maintaining the ability to increase security measures, the facility does not have to expend time and resources on more robust security measures unless and until warranted.

● A facility addressing specific threats, vulnerabilities or risks identified by the Assistant Secretary will decrease the likelihood of a successful attack on its facility, personnel, products or community. Any additional performance standards specified by the Secretary will increase the facilities ability to deter, detect, delay and respond to specific and general threats against its security.

11. Chemical Security Alternatives Analysis

OMB Circular A-4 directs agencies to consider alternative regulatory approaches; however, the Circular also affords agencies considerable flexibility to specify the number and type of alternatives that should be fully analyzed according to the formal principles of Executive Order 12866. In this case, the Department used this discretion to define a reasonable set of alternative approaches that reflected the most relevant policy choices made for this rulemaking.

One regulatory alternative, which the Department considered and rejected, but specifically did not analyze, is applying a more prescriptive design standard to chemical plant security[31]. In the Advance Notice, the Department sought comment on the use of risk-based performance standards to address facility-identified vulnerabilities. In response to the Advance Notice, the majority of the commenters supported the proposed regulatory approach due to the flexibility that the risk-based performance standards provide to the regulated community in choosing security measures for their respective facilities. The proposed approach acknowledges the fact that each of the facilities faces different security challenges.

As stated in the preamble, the Department is adopting a risk-based performance standard, that each facility should adequately "deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful." Although

[31] Section 550 of the Act states that "…the Secretary may not disapprove a site security plan submitted under this section based on the presence or absence of a particular security measure, but the Secretary may disapprove a site security plan if the plan fails to satisfy the risk-based performance standards established by this section…"

the cost estimates provided in the analysis include provisions that would have been included in any design standard, and therefore the costs estimates may be somewhat reflective of any design standard the Department would have considered, we believe for this rulemaking that any design standard would have been inherently higher cost and lower benefit. The inherent vulnerability of each facility to a terrorist incident is a function of their unique public health and safety risk, economic impact, and the mission critical aspects of the given chemicals and the Threshold Quantities (TQ) of the chemicals the facility processes. Any reasonable design standard the Department would have considered would have likely included provisions not useful for some facilities, and would have likely not included other provisions essential to reducing the risk in other facilities. On the other hand, if a design standard were proscriptive enough to include all of the essential provisions for every facility, it would have likely been much higher cost than this rulemaking.

Therefore, the Department has adopted a risk-based, performance approach. Within this approach, the Department has explored alternatives suggested by OMB Circular A-4 that would reflect different degrees of stringency and different requirements for facilities, according to their respective risk-based tiers.

Briefly, the Department defined and took comment on a tiered structure for defining what performance measures a facility may have to apply. Most commenters supported this tiered structure and thought it offered adequate flexibility for the Department to focus its resources on the highest risk facilities. The types and intensity of security measures (necessary to satisfy the risk-based performance standards in the facility's Site Security Plan) will depend on the facility's tier. The Department will mandate the most rigorous levels of protection and regulatory scrutiny for facilities that present the greatest degree of risk. We believe this tiered structure inherently captures both stringency flexibility and different requirements for different sized firms.

The Department considers the specific methods for determining these tiers to be classified information and protected from disclosure, and therefore we cannot discuss the specifics of each tier in this analysis. However, we can discuss the relative costs of relatively less or more stringent definitions of each tier, which we have done in an attempt to be as transparent as possible given the constraints on this discussion.

It should be noted in the cost analysis that the number of facilities the would fall under each tier is inherently uncertain, thus a further goal of this analysis was to determine whether regulatory cost was a significant, decision critical factor in the choice of tiers. For this alternatives analysis, the Department felt that a 10% decrease or increase in the inherent stringency of this rulemaking, as defined by the definitions of the tiers, was as strong a resolution as possible in the inherently uncertain world of trying to consider terrorism risk. In the cost estimates, we assumed that approximately 150 - 250 facilities will qualify as tier 1 and therefore have the highest costs. If the rulemaking were made about 10% less stringent, in the sense that 10% of the Tier 1 Facilities (20 facilities) moved to Tier 2, the 3 year cost at 7% decreased to $3.547 million, which is only a $15 million decline when compared to the primary estimate of 3.562 million. In addition, the Department explored whether the rulemaking stringency could be defined in such a way that 10% more facilities would be required to take the top screen. Because the Department believes that it has adequately captured the highest risk facilities, this expansion of the top screen definition would simply mean that about 5,000 extra facilities would take the top screen, but

almost no additional facilities would be determined, on a preliminary basis, to be a high-risk facility. This type of increased stringency would increase the cost of the rulemaking to $3.575 million, which again is a small percentage of the total cost of the rule.

We explored several other stringency scenarios and came to the same conclusion: regulatory cost is relatively stable among a reasonable set of feasible regulatory alternatives.

Appendix A. Descriptions for the Suite of Capital Security Investments used in Table 8

Primary and secondary fences
For high-risk facilities that may choose to install 2 fences, costs are broken into primary and secondary fences, because many facilities will have installed one fence already. Both primary and secondary fences are assumed to be identical in design and cost. The perimeter fencing is assumed to be a chain link fence that is 8 feet tall, topped with 3-strand barbed wire outriders. In addition, a high-risk enclosed facility may choose to install a fence as a method of securing their perimeter.

Guard house/entry control facility
An entry-control facility built without prefabricated parts that includes HSVAC, rest room, security communications console, and security office) for each entrance. A Group A facility is assumed to have 5 security entrances.

External receiving/shipping area outside perimeter
This is a prefab facility outside the perimeter used to ship and receive incidentals, packages, and small deliveries, but not used for shipping product or receiving raw chemicals.

Security control center
This consists of HSVAC, security-specific electrical/computer support equipment and access control console, etc. for security center. This could be located within an entry control facility, larger guardhouse, or other building within perimeter.

Staging area for vehicle screening
A 200 sq. ft paved area outside the perimeter of the entrance to the facility used to screen vehicles entering the facility. This includes paving, tack and seal coats, curbs, curbs and gutters, subgrade preparation, fine grading, compaction, sub-base course, base course, wearing course, finish course, rails and barriers, reinforcing, expansion/ control joints, wheel stops, and pavement markings.

Active barriers at gate
A moving barrier designed to prevent vehicle penetration at a gate. This moving barrier is assumed to either use hydraulics or electric mechanisms to raise or lift the barrier into place and be controlled from the entry control facility, a guardhouse, or by an access card reader.

Perimeter vehicle barriers
This consists of aircraft cable that is woven through the chain link fence which makes it resistant to vehicle penetration. Only the section of perimeter fencing that is vulnerable to vehicle penetration is assumed to need to be protected.

Electronic access control system and gate
This includes card readers, accessories, wiring, installation for access to perimeter and entrances to secure areas throughout the plant site as well as personnel access barriers (i.e., turnstiles) and vehicle barrier gates per vehicle entrance. If ID badges are chosen to be used, we assume ID badges will be created using a digital camera, badge computer, software and printer.

Jersey Barrier
A barrier which is 3-5 feet tall and made of poured concrete. Jersey barriers can be used to secure targets within plant site (or close to walls) from vehicle penetration.

Lighting (perimeter)
1000 watt sodium vapor lights on poles**.**

Lighting (interior/asset)
400 watt metal halide fixtures and poles are assumed to be wired and installed throughout the interior of the facility.

CCTV system
This consists of digital CCTV cameras and poles, recording system, receivers, repeaters and wiring (including installation). This system also includes video control, storage and a digital recording system.

Fence-line intrusion detection system
This consists of infrared or motion sensors placed around the perimeter and connected to central security area as well as the wiring and installation of the detection system.

Communication system
Intercoms/broadcasting system and wiring for the communication system.

Handheld Radios
This includes radios for to each guard, manager, production/operating center, and other security sensitive individuals to communicate within the plant.

Firewall
This assumes computers will be loaded with software that would prevent individuals outside the network from gaining access to networks within the facility. This is assumed to be installed on all computers that could be hacked to gain access to customer records (theft/diversion) or change process settings to start a release that results in loss of containment.

Locked access to inventory
A 50x50 internal fenced area controlled through a card reader or a locking keyless handle.

Engineering/Design Fee
A fee paid to consultant/engineer to design security investments.

Appendix B. Descriptions for the Suite of Personnel and Readiness Measures

Site Security Officer (SSO)
Potential responsibilities of this individual may include conducting and supervising the SVA and the preparation of the SSP, conducting annual internal audits, hosting DHS inspections, designing and documenting security training, maintaining required records, planning and documenting security drills, and other activities associated with the management of facility security of the facility per the IFR. For facilities where theft and diversion of chemicals is a concern, the SSO may also be responsible for ensuring material accountability and control. The time the SSO spends conducting or reviewing a SVA and preparing or amending an SSP is allocated to those activities during the initial year.

Security Vulnerability Assessment and Site Security Plan (New)
Time spent by SSO, corporate security officer, engineering staff and EHS professionals to conduct SVA and prepare the SSP.

Security Vulnerability Assessment and Site Security Plan (Review/Update)
For a facility that has already conducted a SVA and prepared and SSP, there will be cost associated with the review and update of existing SVAs/SSPs to ensure compliance with CFATS.

Drills
The time of non-SSO participants in the planning, implementing and critiquing of the security and emergency response components of an existing EHS drill.

Audits
Internal audits of the site security plan.

Visitor Escorts
An administrative worker who escorts visitors through the facility.

Security Training
SSO training - Training includes sending the SSO and the alternate SSO (if appropriate) to offsite training annually. Includes a course fee and per diem. DHS estimates that employees/resident contractors will spend 30 minutes of time for additional security training as part of annual EHS training.

Anti- Theft Training
Training for employees on preventing theft and diversion of chemicals. DHS estimates that employees/resident contractors will spend 30 minutes of time for additional theft training as part of annual EHS training.

Personnel Surety
A background check process that verifies and validates identity; includes a criminal history check of publicly or commercially available databases; verifies and validates

legal authorization to work through the I-9 process; and includes measures designed to identify people with terrorist ties.

Orange Threat Level

Assumed to be one two-week period per year. Additional security measures include:

- Tier 1 – 8 additional guard positions
- Tier 2 – 6 additional guard positions
- Tier 3 – 3 additional guard positions
- Tier 4 – 2 guard positions

Appendix C. How facility populations were segmented using the RMP database and NAICS Codes for the Top-Screen Population

Over the next three years, DHS estimates that as many as 50,000 facilities will be initially screened through the online Chemical Security Assessment Tool (CSAT) Top-Screen to help determine if they are a high-risk facility for the purpose of the IFR. Each of the approximately 50,000 facilities will have to register with DHS to use the online tool and submit answers to the screening tool so that DHS can determine, on a preliminary basis, if they are a high-risk facility.

In order to arrive at our estimate of 50,000 facilities expected to perform a Top-Screen, facility data from the EPA Risk Management Program (RMP), SRI Consulting[32] *Directory of Chemical Producers*, and the Homeland Security Infrastructure Program (HSIP), was used to identify approximately 40,000 facilities that might reasonably manufacture, process, use, store, or distribute a chemical (or chemicals). Although not known with certainty due to the lack of explicit chemical data, many of these facilities reasonably may have chemicals that DHS has identified as:

- toxic or flammable materials that may cause harm to human health if there were a loss of containment;
- a chemical weapon, Improvised Explosive Device (IED) chemical or precursor that could be stolen or obtained through diversionary tactics;
- a reactive chemical that could be tampered with and cause harm after leaving the facility.

In addition to these 40,000 facilities, it is expected that there will be an additional number of facilities that will complete a Top-Screen that are not listed among the 40,000. DHS does not have very much information on which to base an estimate for the additional number of facilities beyond the 40,000 facilities previously discussed; however, for the purpose of this analysis, we will assume an additional 10,000 facilities will undergo the Top-Screen process over the three year period of analysis. DHS recognizes that the majority of the 50,000 will complete the Top Screen and subsequently determined to not be a high risk chemical facility.

Facilities completing the Top-Screen were placed into one of the 4 broad categories described below based on the NAICS code of the facility[33]:

1) Large open manufacturing: These facilities are large "open plan" facilities that are assumed to have multiple chemicals onsite. For the purpose of analysis, DHS defines "large" in this case to be a facility with more than 100 FTEs.

2) Merchant wholesalers (excluding farm supply wholesalers) and retailers: These facilities are expected to have many chemicals in their inventories for which

[32] Formerly known as Stanford Research Institute.
[33] The list of 40,000 facilities (explained previously) contained the NAICS code for approximately 92% of the listed facilities. We used this information to make general assumptions regarding the 50,000 facilities we believe will complete the Top-Screen over the next three years.

data will be required to submit to Top-Screen. Because merchant wholesalers and retailers do not vary in size to the same degree as chemical manufacturing facilities, this set of facilities is not segmented by employment size.

3) Facilities with 1 or 2 chemicals: These are facilities that have only one or two chemicals onsite. Generally, these facilities include those that use anhydrous ammonia for commercial/industrial refrigeration, farm supply wholesalers that stock only one or two chemicals of concern (i.e., ammonium nitrate), and facilities that likely have only chlorine and no other chemicals of concern on site (i.e., industrial launderers).

4) Other facilities: This group includes other "open plan" facilities with 99 or fewer FTEs, other manufacturers, and other industries which manufacture, process, store, use or distribute chemicals of concern.

Approach for Segmenting Screening Population into Large Open, Merchant Wholesalers, Facilities with only 1 or 2 Chemicals and Other Chemical Facilities

DHS determined which facilities were in each category by identifying which category a particular NAICS code was likely to be in. For example, petroleum refineries are generally "open plan" facilities. DHS recognizes that there may be exceptions within NAICS codes, but for the purpose of this analysis, all facilities within a particular NAICS code are assumed to be in one of the designated categories. DHS counted the number of facilities in each category and divided by the total number to calculate the distribution percentages. These percentages were applied to the total screening population to estimate the number in each category.

The following NAICS codes were considered to be open facilities and had at least one facility with more than 100 FTEs. Because the Top-Screen list did not include data on FTE's, DHS used the EPA Risk Management Plan (RMP) data[34] for 11,000 facilities not exempt from the IFR[35] to determine the percentage of those facilities within an "open plan" NAICS code that had more than 100 FTEs. These percentages were then applied to the number of facilities in the open NAICS codes of the Top-Screen List.

[34] The EPA RMP database contains data on 15,000 facilities registered under EPA's Risk Management Program. After eliminating the facilities exempted by Section 550, 11,000 facilities are potentially covered.

[35] Section 550 exempts from its coverage several categories of facilities. According to the statutory exemptions, the regulations issued under Section 550 will not apply to public water systems (as defined by section 1401 of the Safe Drinking Water Act); water treatment works facilities (as defined by section 212 of the Federal Water Pollution Control Act); any facilities owned or operated by the Departments of Defense and Energy; and any facilities subject to regulation by the Nuclear Regulatory Commission. The regulations promulgated under Section 550 also will not apply to maritime facilities regulated by the Coast Guard pursuant to the Maritime Transportation Security Act of 2002.

Appendix C Table 1

NAICS Code	NAICS Description
32411	Petroleum Refineries
32419	Other Petroleum and Coal Products Manufacturing
32511	Petrochemical Manufacturing
32512	Industrial Gas Manufacturing
32513	Synthetic Dye and Pigment Manufacturing
32518	Other Basic Inorganic Chemical Manufacturing
32519	Other Basic Organic Chemical Manufacturing
32521	Resin and Synthetic Rubber Manufacturing
32522	Artificial and Synthetic Fibers and Filaments Manufacturing
32531	Fertilizer Manufacturing
32532	Pesticide and Other Agricultural Chemical Manufacturing
32551	Paint and Coating Manufacturing
32552	Adhesive Manufacturing
32561	Soap and Cleaning Compound Manufacturing
32562	Toilet Preparation Manufacturing
32592	Explosives Manufacturing
32599	All Other Chemical Product and Preparation Manufacturing
48691	Pipeline Transportation of Refined Petroleum Products
211111	Crude Petroleum and Natural Gas Extraction
324191	Petroleum Lubricating Oil and Grease Manufacturing
324199	All Other Petroleum and Coal Products Manufacturing
325110	Petrochemical Manufacturing
325120	Industrial Gas Manufacturing
325131	Inorganic Dye and Pigment Manufacturing
325132	Synthetic Organic Dye and Pigment Manufacturing
325181	Alkalies and Chlorine Manufacturing
325182	Carbon Black Manufacturing
325188	All Other Basic Inorganic Chemical Manufacturing
325192	Cyclic Crude and Intermediate Manufacturing
325193	Ethyl Alcohol Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic Rubber Manufacturing
325221	Cellulosic Organic Fiber Manufacturing
325222	Noncellulosic Organic Fiber Manufacturing
325311	Nitrogenous Fertilizer Manufacturing

Appendix C Table 1 (continued)

NAICS Code	NAICS Description
325312	Phosphatic Fertilizer Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
325510	Paint and Coating Manufacturing
325520	Adhesive Manufacturing
325611	Soap and Other Detergent Manufacturing
325612	Polish and Other Sanitation Good Manufacturing
325613	Surface Active Agent Manufacturing
325620	Toilet Preparation Manufacturing
325910	Printing Ink Manufacturing
325920	Explosives Manufacturing
325991	Custom Compounding of Purchased Resins
325992	Photographic Film, Paper, Plate, and Chemical Manufacturing
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing

The following NAICS codes were considered to be merchant wholesalers and retailers of chemicals (excluding wholesalers using ammonia refrigeration, farm supply wholesalers).

Appendix C Table 2

NAICS Code	NAICS Description
42221	Drugs and Druggists' Sundries Merchant Wholesalers (97 NAICS)
42269	Other Chemical and Allied Products Merchant Wholesalers (97 NAICS)
42272	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals) (97 NAICS)
42339	Other Construction Material Merchant Wholesalers
42399	Other Miscellaneous Durable Goods Merchant Wholesalers
42421	Drugs and Druggists' Sundries Merchant Wholesalers
42469	Other Chemical and Allied Products Merchant Wholesalers
42472	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
42495	Paint, Varnish, and Supplies Merchant Wholesalers
42499	Other Miscellaneous Nondurable Goods Merchant Wholesalers
423840	Industrial Supplies Merchant Wholesalers
423850	Service Establishment Equipment and Supplies Merchant Wholesalers
424210	Drugs and Druggists' Sundries Merchant Wholesalers
424690	Other Chemical and Allied Products Merchant Wholesalers
444130	Hardware Stores
446110	Pharmacies and Drug Stores

The following NAICS codes were considered to have only one or two chemicals at the facility that would be inventoried for Top-Screen. These include facilities that use anhydrous ammonia for refrigeration, facilities that store ammonium nitrate, and facilities that likely have only chlorine and no other chemicals of concern on site (i.e., industrial launderers).

Appendix C Table 3

NAICS Code	NAICS Description
11111	Soybean Farming
11113	Dry Pea and Bean Farming
11114	Wheat Farming
11115	Corn Farming
11116	Rice Farming
11119	Other Grain Farming
11121	Vegetable and Melon Farming
11131	Orange Groves
11132	Citrus (except Orange) Farming
11133	Noncitrus Fruit and Tree Nut Farming
11142	Nursery and Floriculture Production
11199	All Other Crop Farming
11211	Beef Cattle Ranching and Farming
11213	Dual-Purpose Cattle Ranching and Farming
11221	Hog and Pig Farming
11231	Chicken Egg Production
11232	Broilers and Other Meat Type Chicken Production
11233	Turkey Production
11239	Other Poultry Production
11291	Apiculture
11511	Support Activities for Crop Production
11521	Support Activities for Animal Production
22131	Water Supply and Irrigation Systems
22132	Sewage Treatment Facilities
22133	Steam and Air-Conditioning Supply
23622	Commercial and Institutional Building Construction
31111	Animal Food Manufacturing
31121	Flour Milling and Malt Manufacturing
31122	Starch and Vegetable Fats and Oils Manufacturing
31123	Breakfast Cereal Manufacturing
31131	Sugar Manufacturing
31132	Chocolate and Confectionery Manufacturing from Cacao Beans
31133	Confectionery Manufacturing from Purchased Chocolate
31134	Nonchocolate Confectionery Manufacturing
31141	Frozen Food Manufacturing

Appendix C Table 3 (continued)

NAICS Code	NAICS Description
31142	Fruit and Vegetable Canning, Pickling, and Drying
31151	Dairy Product (except Frozen) Manufacturing
31152	Ice Cream and Frozen Dessert Manufacturing
31161	Animal Slaughtering and Processing
31171	Seafood Product Preparation and Packaging
31181	Bread and Bakery Product Manufacturing
31182	Cookie, Cracker, and Pasta Manufacturing
31183	Tortilla Manufacturing
31191	Snack Food Manufacturing
31192	Coffee and Tea Manufacturing
31193	Flavoring Syrup and Concentrate Manufacturing
31199	All Other Food Manufacturing
31211	Soft Drink and Ice Manufacturing
31212	Breweries
31213	Wineries
31214	Distilleries
42174	Refrigeration Equipment and Supplies Merchant Wholesalers (97 NAICS)
42241	General Line Grocery Merchant Wholesalers (97 NAICS)
42242	Packaged Frozen Food Merchant Wholesalers (97 NAICS)
42243	Dairy Product (except Dried or Canned) Merchant Wholesalers (97 NAICS)
42247	Meat and Meat Product Merchant Wholesalers (97 NAICS)
42248	Fresh Fruit and Vegetable Merchant Wholesalers (97 NAICS)
42249	Other Grocery and Related Products Merchant Wholesalers (97 NAICS)
42251	Grain and Field Bean Merchant Wholesalers (97 NAICS)
42259	Other Farm Product Raw Material Merchant Wholesalers (97 NAICS)
42291	Farm Supplies Merchant Wholesalers (97 NAICS)
42442	Packaged Frozen Food Merchant Wholesalers
42443	Dairy Product (except Dried or Canned) Merchant Wholesalers
42447	Meat and Meat Product Merchant Wholesalers
42448	Fresh Fruit and Vegetable Merchant Wholesalers
42449	Other Grocery and Related Products Merchant Wholesalers
42451	Grain and Field Bean Merchant Wholesalers
42452	Livestock Merchant Wholesalers
42459	Other Farm Product Raw Material Merchant Wholesalers
42491	Farm Supplies Merchant Wholesalers
44422	Nursery, Garden Center, and Farm Supply Stores
44511	Supermarkets and Other Grocery (except Convenience) Stores
44523	Fruit and Vegetable Markets

Appendix C Table 3 (continued)

NAICS Code	NAICS Description
45291	Warehouse Clubs and Supercenters
49312	Refrigerated Warehousing and Storage
49313	Farm Product Warehousing and Storage
111191	Oilseed and Grain Combination Farming
111199	All Other Grain Farming
111211	Potato Farming
111219	Other Vegetable and Melon Farming
111332	Grape Vineyards
111336	Fruit and Tree Nut Combination Farming
111339	Other Noncitrus Fruit Farming
111422	Floriculture Production
111991	Sugar Beet Farming
111992	Peanut Farming
111998	All Other Miscellaneous Crop Farming
114210	Hunting and Trapping
115111	Cotton Ginning
115112	Soil Preparation, Planting, and Cultivating
115113	Crop Harvesting, Primarily by Machine
115114	Postharvest Crop Activities (except Cotton Ginning)
115116	Farm Management Services
311111	Dog and Cat Food Manufacturing
311211	Flour Milling
311213	Malt Manufacturing
311221	Wet Corn Milling
311222	Soybean Processing
311223	Other Oilseed Processing
311225	Fats and Oils Refining and Blending
311313	Beet Sugar Manufacturing
311411	Frozen Fruit, Juice, and Vegetable Manufacturing
311412	Frozen Specialty Food Manufacturing
311421	Fruit and Vegetable Canning
311422	Specialty Canning
311423	Dried and Dehydrated Food Manufacturing
311511	Fluid Milk Manufacturing
311512	Creamery Butter Manufacturing
311513	Cheese Manufacturing
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing
311611	Animal (except Poultry) Slaughtering

Appendix C Table 3 (continued)

NAICS Code	NAICS Description
311612	Meat Processed from Carcasses
311613	Rendering and Meat Byproduct Processing
311615	Poultry Processing
311711	Seafood Canning
311712	Fresh and Frozen Seafood Processing
311811	Retail Bakeries
311812	Commercial Bakeries
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing
311821	Cookie and Cracker Manufacturing
311822	Flour Mixes and Dough Manufacturing from Purchased Flour
311823	Dry Pasta Manufacturing
311911	Roasted Nuts and Peanut Butter Manufacturing
311919	Other Snack Food Manufacturing
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
311942	Spice and Extract Manufacturing
311991	Perishable Prepared Food Manufacturing
311999	All Other Miscellaneous Food Manufacturing
312111	Soft Drink Manufacturing
312113	Ice Manufacturing
424520	Livestock Merchant Wholesalers
424910	Farm Supplies Merchant Wholesalers
447190	Other Gasoline Stations
713910	Golf Courses and Country Clubs
812332	Industrial Launderers
42441	General Line Grocery Merchant Wholesalers

The following NAICS codes did not fit any of the previous three categories. This category also contains open facilities with 99 or fewer FTEs. Note that several of the NAICS codes in this category also appeared in the category for large open where there were facilities with more than 100 FTEs.

Appendix C Table 4

NAICS Code	NAICS Description
21111	Oil and Gas Extraction
22121	Natural Gas Distribution
42271	Petroleum Bulk Stations and Terminals (97 NAICS)
42471	Petroleum Bulk Stations and Terminals
45431	Fuel Dealers
48611	Pipeline Transportation of Crude Oil
48621	Pipeline Transportation of Natural Gas
48699	All Other Pipeline Transportation
211112	Natural Gas Liquid Extraction
324121	Asphalt Paving Mixture and Block Manufacturing
325191	Gum and Wood Chemical Manufacturing
325314	Fertilizer (Mixing Only) Manufacturing
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers
21211	Coal Mining
21222	Gold Ore and Silver Ore Mining
21229	Other Metal Ore Mining
21232	Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying
21239	Other Nonmetallic Mineral Mining and Quarrying
21311	Support Activities for Mining
22111	Electric Power Generation
22112	Electric Power Transmission, Control, and Distribution
23491	Water, Sewer and Pipeline Construction (97 NAICS)
31324	Knit Fabric Mills
31331	Textile and Fabric Finishing Mills
31411	Carpet and Rug Mills
31499	All Other Textile Product Mills
31511	Hosiery and Sock Mills
32211	Pulp Mills
32212	Paper Mills
32213	Paperboard Mills
32222	Paper Bag and Coated and Treated Paper Manufacturing
32229	Other Converted Paper Product Manufacturing
32311	Printing
32541	Pharmaceutical and Medicine Manufacturing
32611	Plastics Packaging Materials and Unlaminated Film and Sheet Manufacturing
32613	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
32614	Polystyrene Foam Product Manufacturing
32615	Urethane and Other Foam Product (except Polystyrene) Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
21111	Oil and Gas Extraction
22121	Natural Gas Distribution
42271	Petroleum Bulk Stations and Terminals (97 NAICS)
42471	Petroleum Bulk Stations and Terminals
45431	Fuel Dealers
48611	Pipeline Transportation of Crude Oil
48621	Pipeline Transportation of Natural Gas
48699	All Other Pipeline Transportation
211112	Natural Gas Liquid Extraction
324121	Asphalt Paving Mixture and Block Manufacturing
325191	Gum and Wood Chemical Manufacturing
325314	Fertilizer (Mixing Only) Manufacturing
454312	Liquefied Petroleum Gas (Bottled Gas) Dealers
21211	Coal Mining
21222	Gold Ore and Silver Ore Mining
21229	Other Metal Ore Mining
21232	Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying
21239	Other Nonmetallic Mineral Mining and Quarrying
21311	Support Activities for Mining
22111	Electric Power Generation
22112	Electric Power Transmission, Control, and Distribution
23491	Water, Sewer and Pipeline Construction (97 NAICS)
31324	Knit Fabric Mills
31331	Textile and Fabric Finishing Mills
31411	Carpet and Rug Mills
31499	All Other Textile Product Mills
31511	Hosiery and Sock Mills
32211	Pulp Mills
32212	Paper Mills
32213	Paperboard Mills
32222	Paper Bag and Coated and Treated Paper Manufacturing
32229	Other Converted Paper Product Manufacturing
32311	Printing
32541	Pharmaceutical and Medicine Manufacturing
32611	Plastics Packaging Materials and Unlaminated Film and Sheet Manufacturing
32613	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
32614	Polystyrene Foam Product Manufacturing
32615	Urethane and Other Foam Product (except Polystyrene) Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
32619	Other Plastics Product Manufacturing
32621	Tire Manufacturing
32629	Other Rubber Product Manufacturing
32711	Pottery, Ceramics, and Plumbing Fixture Manufacturing
32721	Glass and Glass Product Manufacturing
32731	Cement Manufacturing
32742	Gypsum Product Manufacturing
33111	Iron and Steel Mills and Ferroalloy Manufacturing
33121	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel
33122	Rolling and Drawing of Purchased Steel
33131	Alumina and Aluminum Production and Processing
33141	Nonferrous Metal (except Aluminum) Smelting and Refining
33152	Nonferrous Metal Foundries
33221	Cutlery and Handtool Manufacturing
33251	Hardware Manufacturing
33281	Coating, Engraving, Heat Treating, and Allied Activities
33299	All Other Fabricated Metal Product Manufacturing
33312	Construction Machinery Manufacturing
33351	Metalworking Machinery Manufacturing
33411	Computer and Peripheral Equipment Manufacturing
33422	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
33429	Other Communications Equipment Manufacturing
33441	Semiconductor and Other Electronic Component Manufacturing
33511	Electric Lamp Bulb and Part Manufacturing
33522	Major Appliance Manufacturing
33531	Electrical Equipment Manufacturing
33591	Battery Manufacturing
33599	All Other Electrical Equipment and Component Manufacturing
33621	Motor Vehicle Body and Trailer Manufacturing
33632	Motor Vehicle Electrical and Electronic Equipment Manufacturing
33633	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing
33634	Motor Vehicle Brake System Manufacturing
33635	Motor Vehicle Transmission and Power Train Parts Manufacturing
33636	Motor Vehicle Seating and Interior Trim Manufacturing
33637	Motor Vehicle Metal Stamping
33639	Other Motor Vehicle Parts Manufacturing
33641	Aerospace Product and Parts Manufacturing
33651	Railroad Rolling Stock Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
33699	Other Transportation Equipment Manufacturing
33712	Household and Institutional Furniture Manufacturing
33791	Mattress Manufacturing
33999	All Other Miscellaneous Manufacturing
42181	Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers (97 NAICS)
42292	Book, Periodical, and Newspaper Merchant Wholesalers (97 NAICS)
44112	Used Car Dealers
44711	Gasoline Stations with Convenience Stores
44719	Other Gasoline Stations
45399	All Other Miscellaneous Store Retailers
45439	Other Direct Selling Establishments
48811	Airport Operations
48821	Support Activities for Rail Transportation
48831	Port and Harbor Operations
48832	Marine Cargo Handling
48849	Other Support Activities for Road Transportation
49111	Postal Service
49311	General Warehousing and Storage
49319	Other Warehousing and Storage
54138	Testing Laboratories
54171	Research and Development in the Physical, Engineering, and Life Sciences
56179	Other Services to Buildings and Dwellings
56199	All Other Support Services
56211	Waste Collection
56221	Waste Treatment and Disposal
56292	Materials Recovery Facilities
56299	All Other Waste Management Services
71399	All Other Amusement and Recreation Industries
72112	Casino Hotels
81131	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance
92114	Executive and Legislative Offices
92119	Other General Government Support
92214	Correctional Institutions
92219	Other Justic, Public Order and Safety Activities
92411	Administration of Air and Water Resource and Solid Waste Management Programs
92613	Regulation and Administration of Communications, Electric, Gas and Other Utilities
92711	Space Research and Technology
92811	National Security

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
212111	Bituminous Coal and Lignite Surface Mining
212221	Gold Ore Mining
212234	Copper Ore and Nickel Ore Mining
212291	Uranium-Radium-Vanadium Ore Mining
212299	All Other Metal Ore Mining
212324	Kaolin and Ball Clay Mining
212391	Potash, Soda, and Borate Mineral Mining
212399	All Other Nonmetallic Mineral Mining
213112	Support Activities for Oil and Gas Operations
213113	Support Activities for Coal Mining
213114	Support Activities for Metal Mining
221112	Fossil Fuel Electric Power Generation
221113	Nuclear Electric Power Generation
221119	Other Electric Power Generation
221122	Electric Power Distribution
311119	Other Animal Food Manufacturing
312112	Bottled Water Manufacturing
313210	Broadwoven Fabric Mills
313311	Broadwoven Fabric Finishing Mills
314992	Tire Cord and Tire Fabric Mills
315221	Men's and Boys' Cut and Sew Underwear and Nightwear Manufacturing
321114	Wood Preservation
321219	Reconstituted Wood Product Manufacturing
322121	Paper (except Newsprint) Mills
322122	Newsprint Mills
322211	Corrugated and Solid Fiber Box Manufacturing
322215	Nonfolding Sanitary Food Container Manufacturing
322222	Coated and Laminated Paper Manufacturing
322223	Plastics, Foil, and Coated Paper Bag Manufacturing
325411	Medicinal and Botanical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325413	In-Vitro Diagnostic Substance Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing
326121	Unlaminated Plastics Profile Shape Manufacturing
326199	All Other Plastics Product Manufacturing
326211	Tire Manufacturing (except Retreading)
326299	All Other Rubber Product Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
327111	Vitreous China Plumbing Fixture and China and Earthenware Bathroom Accessories Manufacturing
327112	Vitreous China, Fine Earthenware, and Other Pottery Product Manufacturing
327113	Porcelain Electrical Supply Manufacturing
327211	Flat Glass Manufacturing
327212	Other Pressed and Blown Glass and Glassware Manufacturing
327215	Glass Product Manufacturing Made of Purchased Glass
327992	Ground or Treated Mineral and Earth Manufacturing
327993	Mineral Wool Manufacturing
327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing
331111	Iron and Steel Mills
331112	Electrometallurgical Ferroalloy Product Manufacturing
331221	Rolled Steel Shape Manufacturing
331222	Steel Wire Drawing
331311	Alumina Refining
331312	Primary Aluminum Production
331314	Secondary Smelting and Alloying of Aluminum
331315	Aluminum Sheet, Plate, and Foil Manufacturing
331316	Aluminum Extruded Product Manufacturing
331411	Primary Smelting and Refining of Copper
331419	Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)
331421	Copper Rolling, Drawing, and Extruding
331423	Secondary Smelting, Refining, and Alloying of Copper
331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding
331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)
331513	Steel Foundries (except Investment)
331521	Aluminum Die-Casting Foundries
331522	Nonferrous (except Aluminum) Die-Casting Foundries
331524	Aluminum Foundries (except Die-Casting)
331525	Copper Foundries (except Die-Casting)
331528	Other Nonferrous Foundries (except Die-Casting)
332111	Iron and Steel Forging
332112	Nonferrous Forging
332116	Metal Stamping
332117	Powder Metallurgy Part Manufacturing
332211	Cutlery and Flatware (except Precious) Manufacturing
332212	Hand and Edge Tool Manufacturing
332321	Metal Window and Door Manufacturing
332322	Sheet Metal Work Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
332439	Other Metal Container Manufacturing
332618	Other Fabricated Wire Product Manufacturing
332811	Metal Heat Treating
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring
332912	Fluid Power Valve and Hose Fitting Manufacturing
332919	Other Metal Valve and Pipe Fitting Manufacturing
332991	Ball and Roller Bearing Manufacturing
332992	Small Arms Ammunition Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
333298	All Other Industrial Machinery Manufacturing
333314	Optical Instrument and Lens Manufacturing
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing
333512	Machine Tool (Metal Cutting Types) Manufacturing
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333515	Cutting Tool and Machine Tool Accessory Manufacturing
333611	Turbine and Turbine Generator Set Units Manufacturing
333613	Mechanical Power Transmission Equipment Manufacturing
333911	Pump and Pumping Equipment Manufacturing
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing
333992	Welding and Soldering Equipment Manufacturing
333995	Fluid Power Cylinder and Actuator Manufacturing
333999	All Other Miscellaneous General Purpose Machinery Manufacturing
334412	Bare Printed Circuit Board Manufacturing
334413	Semiconductor and Related Device Manufacturing
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing
334419	Other Electronic Component Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334519	Other Measuring and Controlling Device Manufacturing
334613	Magnetic and Optical Recording Media Manufacturing
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing
335222	Household Refrigerator and Home Freezer Manufacturing
335921	Fiber Optic Cable Manufacturing
335991	Carbon and Graphite Product Manufacturing
336211	Motor Vehicle Body Manufacturing
336312	Gasoline Engine and Engine Parts Manufacturing
336399	All Other Motor Vehicle Parts Manufacturing

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
336412	Aircraft Engine and Engine Parts Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336611	Ship Building and Repairing
336991	Motorcycle, Bicycle, and Parts Manufacturing
337214	Office Furniture (except Wood) Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
339914	Costume Jewelry and Novelty Manufacturing
339991	Gasket, Packing, and Sealing Device Manufacturing
339994	Broom, Brush, and Mop Manufacturing
339999	All Other Miscellaneous Manufacturing
42382	Farm and Garden Machinery and Equipment Merchant Wholesalers
452111	Department Stores (except Discount Department Stores)
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)
454319	Other Fuel Dealers
532291	Home Health Equipment Rental
532299	All Other Consumer Goods Rental
541690	Other Scientific and Technical Consulting Services
541720	Research and Development in the Social Sciences and Humanities
541860	Direct Mail Advertising
561431	Private Mail Centers
562211	Hazardous Waste Treatment and Disposal
562213	Solid Waste Combustors and Incinerators
562219	Other Nonhazardous Waste Treatment and Disposal
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures
811219	Other Electronic and Precision Equipment Repair and Maintenance
812921	Photofinishing Laboratories (except One-Hour)
31323	Nonwoven Fabric Mills
61111	Elementary and Secondary Schools
61131	Colleges, Universities, and Professional Schools
62211	General Medical and Surgical Hospitals
62321	Residential Mental Retardation Facilities
62322	Residential Mental Health and Substance Abuse Facilities
71121	Spectator Sports
71131	Promoters of Performing Arts, Sports, and Similar Events with Facilities
71219	Nature Parks and Other Similar Institutions
71311	Amusement and Theme Parks

Appendix C Table 4 (continued)

NAICS Code	NAICS Description
71312	Amusement Arcades
71394	Fitness and Recreational Sports Centers
48211	Rail Transportation
48411	General Freight Trucking, Local
48422	Specialized Freight (except Used Goods) Trucking, Local
48423	Specialized Freight (except Used Goods) Trucking, Long-Distance
99999	Unclassified
482111	Rail Transportation
484122	General Freight Trucking, Long-Distance, Less Than Truckload

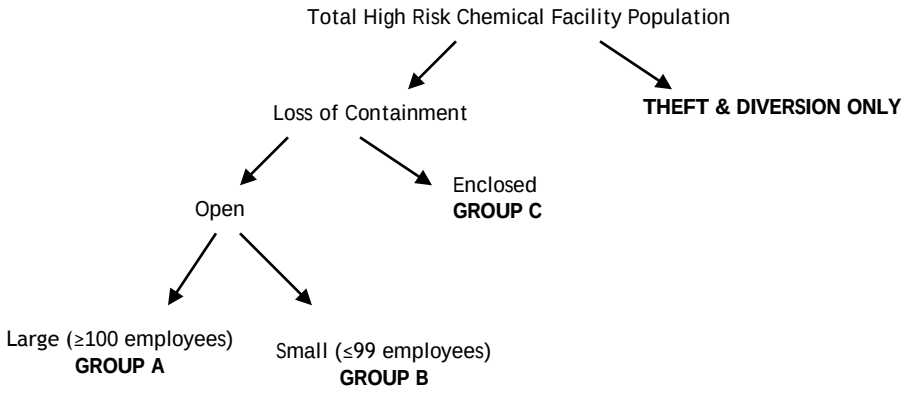
Appendix D. How facility populations were segmented using the RMP database and NAICS Codes for Loss of Containment Model Facility Population (Groups A, B, and C)

Data source

EPA RMP database for non-exempt facilities further segmented using a DHS estimate of the facilities that may be found to be high-risk under the IFR.

Approach for Estimating Groups A, B, and C for Regulatory Evaluation

Below is a graphic illustrating how the chemical facility population was segmented into four model facility populations, including the three loss of containment populations, Groups A, B, and C for which we used the RMP data to estimate approximate shares of the total loss of containment population.



DHS determined which facilities were in each category by identifying which category a particular NAICS code was likely to be in. For example, petroleum refineries are generally "open plan" facilities and chemical and allied products merchant wholesalers are generally "enclosed" facilities. DHS recognizes that there may be exceptions within NAICS codes, but for the purpose of this analysis, all facilities within a particular NAICS code are assumed to be in one of the designated population categories. A list of which NAICS codes are represented in each population category is presented below. Generally, open plan facilities include NAICS 211 (oil and gas extraction), 22121 (natural gas distribution), 324 (petroleum products), 325 excluding 3254 (chemical manufacturing excluding pharmaceuticals), 45431 (fuel dealers (including (liquefied petroleum gas)), 486 (pipelines), and 42471 (bulk petroleum terminals). All other facilities are assumed to be enclosed within a building.

For each NAICS codes, DHS identified it as "open plan", "enclosed", or a facility where the likely risk is anhydrous ammonia is stored in outside tanks for refrigeration.

DHS assumed facilities in food and beverage processing, merchant wholesalers of food products and refrigerated warehouses are in this category. These facilities are included in Group B. We then sorted the open facilities by the number of FTE's and counted the number of open facilities with 100 or more employees, the number of open facilities with 99 or fewer employees, and the number of enclosed facilities. Enclosed facilities are not segmented by employment size. For each tier, DHS divided the number of facilities in each model facility category by the total number of facilities in that tier to calculate a set of distribution percentages. These percentages were applied to the estimated facility population for loss of containment for each tier to estimate Groups A, B, and C by tier.

Note that the categories for "high-risk" chemical facility population are different that the categories used to segment the Top-Screen population described in Appendix C.

The table below shows the distribution of RMP facilities by type.

Appendix D Table 1

NAICS Description	NAICS Code	Open	Anhydrous Ammonia	Enclosed
Vegetable and Melon Farming	11121			x
Nursery and Floriculture Production	11142			x
Broilers and Other Meat Type Chicken Production	11232		x	
Support Activities for Animal Production	11521		x	
Oil and Gas Extraction	21111	x		
Electric Power Generation	22111			x
Natural Gas Distribution	22121	x		
Steam and Air-Conditioning Supply	22133			x
Sugar Manufacturing	31131		x	
Dairy Product (except Frozen) Manufacturing	31151		x	
Ice Cream and Frozen Dessert Manufacturing	31152		x	
Animal Slaughtering and Processing	31161		x	
Breweries	31212		x	
Wineries	31213		x	
Nonwoven Fabric Mills	31323			x
Pulp Mills	32211			x
Paper Mills	32212			x
Paperboard Mills	32213			x
Petroleum Refineries	32411	x		
Other Petroleum and Coal Products Manufacturing	32419	x		
Petrochemical Manufacturing	32511	x		
Industrial Gas Manufacturing	32512	x		
Other Basic Inorganic Chemical Manufacturing	32518	x		
Other Basic Organic Chemical Manufacturing	32519	x		
Resin and Synthetic Rubber Manufacturing	32521	x		
Fertilizer Manufacturing	32531	x		
Pesticide and Other Agricultural Chemical Manufacturing	32532	x		
Pharmaceutical and Medicine Manufacturing	32541			x
Paint and Coating Manufacturing	32551	x		
Adhesive Manufacturing	32552	x		
Soap and Cleaning Compound Manufacturing	32561	x		
Explosives Manufacturing	32592	x		
All Other Chemical Product and Preparation Manufacturing	32599	x		
Polystyrene Foam Product Manufacturing	32614			x
Urethane and Other Foam Product (except Polystyrene) Manufacturing	32615			x
Other Rubber Product Manufacturing	32629			x
Glass and Glass Product Manufacturing	32721			x
Cement Manufacturing	32731			x
Alumina and Aluminum Production and Processing	33131			x
Nonferrous Metal (except Aluminum) Smelting and Refining	33141			x
Construction Machinery Manufacturing	33312			x
Semiconductor and Other Electronic Component Manufacturing	33441			x

Appendix D Table 1 (continued)

NAICS Description	NAICS Code	Open	Anhydrous Ammonia	Enclosed
Other Motor Vehicle Parts Manufacturing	33639			x
Aerospace Product and Parts Manufacturing	33641			x
General Line Grocery Merchant Wholesalers	42441		x	
Packaged Frozen Food Merchant Wholesalers	42442		x	
Other Farm Product Raw Material Merchant Wholesalers	42459		x	
Other Chemical and Allied Products Merchant Wholesalers	42469			x
Petroleum Bulk Stations and Terminals	42471	x		
Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)	42472			x
Farm Supplies Merchant Wholesalers	42491			x
Used Car Dealers	44112			x
Nursery, Garden Center, and Farm Supply Stores	44422			x
Fuel Dealers	45431	x		
Other Direct Selling Establishments	45439			x
Rail Transportation	48211			x
Specialized Freight (except Used Goods) Trucking, Local	48422			x
Specialized Freight (except Used Goods) Trucking, Long-Distance	48423			x
Pipeline Transportation of Refined Petroleum Products	48691	x		
All Other Pipeline Transportation	48699	x		
Support Activities for Rail Transportation	48821			x
Other Support Activities for Road Transportation	48849			x
General Warehousing and Storage	49311			x
Refrigerated Warehousing and Storage	49312		x	
Other Warehousing and Storage	49319			x
Other Services to Buildings and Dwellings	56179			x
Waste Treatment and Disposal	56221			x
All Other Waste Management Services	56299			x
General Medical and Surgical Hospitals	62211			x
Community Housing Services	62422			x
Amusement Arcades	71312			x
All Other Amusement and Recreation Industries	71399			x
Religious Organizations	81311			x
Correctional Institutions	92214			x
Administration of Air and Water Resource and Solid Waste Management Programs	92411			x
Unclassified	99999			x

Appendix D Table 1 (continued)

NAICS Description	NAICS Code	Open	Anhydrous Ammonia	Enclosed
Other Vegetable (except Potato) and Melon Farming	111219			x
Cotton Ginning	115111			x
Soil Preparation, Planting, and Cultivating	115112			x
Postharvest Crop Activities (except Cotton Ginning)	115114			x
Natural Gas Liquid Extraction	211112	x		
Copper Ore and Nickel Ore Mining	212234			x
Uranium-Radium-Vanadium Ore Mining	212291			x
Support Activities for Oil and Gas Operations	213112			x
Fossil Fuel Electric Power Generation	221112			x
Nuclear Electric Power Generation	221113			x
Electric Power Distribution	221122			x
Dog and Cat Food Manufacturing	311111		x	
Flour Milling	311211		x	
Wet Corn Milling	311221		x	
Frozen Specialty Food Manufacturing	311412		x	
Specialty Canning	311422		x	
Fluid Milk Manufacturing	311511		x	
Cheese Manufacturing	311513		x	
Animal (except Poultry) Slaughtering	311611		x	
Meat Processed from Carcasses	311612		x	
Rendering and Meat Byproduct Processing	311613		x	
Commercial Bakeries	311812		x	
Cookie and Cracker Manufacturing	311821		x	
Perishable Prepared Food Manufacturing	311991		x	
All Other Miscellaneous Food Manufacturing	311999		x	
Ice Manufacturing	312113		x	
Paper (except Newsprint) Mills	322121			x
Newsprint Mills	322122			x
Coated and Laminated Paper Manufacturing	322222			x
Commercial Lithographic Printing	323110			x
Petroleum Lubricating Oil and Grease Manufacturing	324191	x		
All Other Petroleum and Coal Products Manufacturing	324199	x		
Inorganic Dye and Pigment Manufacturing	325131	x		
Synthetic Organic Dye and Pigment Manufacturing	325132	x		
Alkalies and Chlorine Manufacturing	325181	x		
All Other Basic Inorganic Chemical Manufacturing	325188	x		
Gum and Wood Chemical Manufacturing	325191	x		
Cyclic Crude and Intermediate Manufacturing	325192	x		
Ethyl Alcohol Manufacturing	325193	x		
All Other Basic Organic Chemical Manufacturing	325199	x		
Plastics Material and Resin Manufacturing	325211	x		
Synthetic Rubber Manufacturing	325212	x		
Nitrogenous Fertilizer Manufacturing	325311	x		
Phosphatic Fertilizer Manufacturing	325312	x		
Fertilizer (Mixing Only) Manufacturing	325314	x		

Appendix D Table 1 (continued)

NAICS Description	NAICS Code	Open	Anhydrous Ammonia	Enclosed
Pharmaceutical Preparation Manufacturing	325412	x		
Soap and Other Detergent Manufacturing	325611	x		
Polish and Other Sanitation Good Manufacturing	325612	x		
Surface Active Agent Manufacturing	325613	x		
Photographic Film, Paper, Plate, and Chemical Manufacturing	325992	x		
All Other Miscellaneous Chemical Product and Preparation Manufacturing	325998	x		
All Other Plastics Product Manufacturing	326199			x
Porcelain Electrical Supply Manufacturing	327113			x
Electrometallurgical Ferroalloy Product Manufacturing	331112			x
Rolled Steel Shape Manufacturing	331221			x
Primary Aluminum Production	331312			x
Secondary Smelting and Alloying of Aluminum	331314			x
Aluminum Extruded Product Manufacturing	331316			x
Primary Smelting and Refining of Copper	331411			x
Primary Smelting and Refining of Nonferrous Metal (except Copper and Aluminum)	331419			x
Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	331492			x
Aluminum Die-Casting Foundries	331521			x
Metal Stamping	332116			x
Metal Heat Treating	332811			x
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	332812			x
Other Metal Valve and Pipe Fitting Manufacturing	332919			x
Ball and Roller Bearing Manufacturing	332991			x
Optical Instrument and Lens Manufacturing	333314			x
Pump and Pumping Equipment Manufacturing	333911			x
Bare Printed Circuit Board Manufacturing	334412			x
Semiconductor and Related Device Manufacturing	334413			x
Printed Circuit Assembly (Electronic Assembly) Manufacturing	334418			x
Other Electronic Component Manufacturing	334419			x
Magnetic and Optical Recording Media Manufacturing	334613			x
Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	335122			x
Other Major Household Appliance Manufacturing	335228			x
Motor Vehicle Body Manufacturing	336211			x
All Other Motor Vehicle Parts Manufacturing	336399			x
Broom, Brush, and Mop Manufacturing	339994			x
All Other Miscellaneous Manufacturing	339999			x
Liquefied Petroleum Gas (Bottled Gas) Dealers	454312	x		
Bus and Other Motor Vehicle Transit Systems	485113			x
All Other Support Activities for Transportation	488999			x
Hazardous Waste Collection	562112			x
Hazardous Waste Treatment and Disposal	562211			x
Solid Waste Combustors and Incinerators	562213			x
Other Nonhazardous Waste Treatment and Disposal	562219			x

Appendix E. Assumptions regarding the Cost of the Registration, Top-Screen, SVA, and SSP

The hourly rates listed below reflect the top 90% percentile average hourly wage paid to employees in NAICS 3251 (Basic Chemical Manufacturing)[36] from the Bureau of Labor Statistics, National Industry-Specific Occupational Employment and Wage Estimates (May 2005). This excludes the corporate security officer whose hourly wage is based on a person at Level 14 (second to highest level) in an Executive, Administrative, and Managerial occupation from the Bureau of Labor Statistics National Compensation Survey (June 2005). An additional 40% is added to all of the hourly rates to reflect benefits and other related overhead costs. Wage rates are rounded to the nearest ten dollars.

Appendix E Table 1. Top-Screen Assumptions

	Average Hourly Rate (inc. 40% benefits)	Hours				Cost			
		Large Open	Other Merchant Wholesalers	Facilities w/1-2 chemicals	Other Facilities	Large Open	Other Merchant Wholesalers	Facilities w/1-2 chemicals	Other Facilities
SSO	80	11.5	9	8.5	9	$920	$720	$680	$720
Corporate Security Officer	100	5	4	4	4	500	400	400	400
Engineering/Technical Staff	70	5	3.5	3	3.5	350	245	210	245
EHS	60	2	1.5	1	1.5	120	90	60	90
Sr. Management	80	4	3	3	3	320	240	240	240
Marketing Manager	90	2	1.5	1	1.5	180	135	90	135
Accounting/Finance	60	2	1.5	1	1.5	120	90	60	90
Lawyer	150	4	3	3	3	600	450	450	450
Inventory/Purchasing	80	2	3	1	1.5	160	240	80	120
R&D manager	90	2	n/a	n/a	1.5	180	0	0	135
Total		**39.5**	**30.0**	**25.5**	**30.0**	**$3,450**	**$2,610**	**$2,270**	**$2,625**

Note: for ease of analysis, total cost per facility has been rounded in some cases.

[36] DHS used the 90th percentile for NAICS 3251 (Basic chemical manufacturing) as a baseline for wage estimates to be conservative because wages in this industry are above average for comparable occupations.

Appendix E Table 2. SVA/SSP Assumptions for Group A – Tier 1 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	84.00	63.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	40.00	30.00	52.00	13.00	13.00
EHS	60	32.00	24.00	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	16.00	12.00	12.00	3.00	3.00
Network administrator	60	24.00	18.00	12.00	3.00	3.00
Lawyer	150	45.00	33.75	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**297.00**	**222.75**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$24,990**	**$18,743**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 3. SVA/SSP Assumptions for Group A – Tier 2 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	84.00	63.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	40.00	30.00	52.00	13.00	13.00
EHS	60	32.00	24.00	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	16.00	12.00	12.00	3.00	3.00
Network administrator	60	24.00	18.00	12.00	3.00	3.00
Lawyer	150	45.00	33.75	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility		**297.00**	**222.75**	**263.00**	**65.75**	**65.75**
Total ($ per facility)		**$24,990**	**$18,743**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 4. SVA/SSP Assumptions for Group A – Tier 3 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA*	New SSP	DHS Required Revisions**	Review/ Update SSP**
SSO	80	84.00	63.00	49.00	12.25	12.25
Corporate Security Officer	100	24.00	18.00	11.00	2.75	2.75
Technical Staff	70	40.00	30.00	26.00	6.50	6.50
EHS	60	32.00	24.00	22.00	5.50	5.50
Clerical Staff	40	24.00	18.00	5.50	1.38	1.38
Sr. Management	80	16.00	12.00	6.00	1.50	1.50
Network administrator	60	24.00	18.00	6.00	1.50	1.50
Lawyer	150	45.00	33.75	4.00	1.00	1.00
R&D manager	90	8.00	6.00	2.00	0.50	0.50
Total hours per facility	n/a	**297.00**	**222.75**	**131.50**	**32.88**	**32.88**
Total ($ per facility)	n/a	**$24,990**	**$18,743**	**$10,000**	**$2,500**	**$2,500**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 5. SVA/SSP Assumptions for Group A – Tier 4 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	52.00	39.00	24.50	6.13	6.13
Corporate Security Officer	100	18.00	13.50	5.50	1.38	1.38
Technical Staff	70	26.00	19.50	13.00	3.25	3.25
EHS	60	18.00	13.50	11.00	2.75	2.75
Clerical Staff	40	18.00	13.50	2.75	0.69	0.69
Sr. Management	80	10.00	7.50	3.00	0.75	0.75
Network administrator	60	10.00	7.50	3.00	0.75	0.75
Lawyer	150	22.00	16.50	2.00	0.50	0.50
R&D manager	90	8.00	6.00	1.00	0.25	0.25
Total hours per facility	n/a	**182.00**	**136.50**	**65.75**	**16.44**	**16.44**
Total ($ per facility)	n/a	**$15,000**	**$11,250**	**$5,000**	**$1,250**	**$1,250**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 6. SVA/SSP Assumptions for Group B – Tier 1 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 7. SVA/SSP Assumptions for Group B – Tier 2 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 8. SVA/SSP Assumptions for Group B – Tier 3 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	49.00	12.25	12.25
Corporate Security Officer	100	24.00	18.00	11.00	2.75	2.75
Technical Staff	70	42.00	31.50	26.00	6.50	6.50
EHS	60	34.00	25.50	22.00	5.50	5.50
Clerical Staff	40	24.00	18.00	5.50	1.38	1.38
Sr. Management	80	12.00	9.00	6.00	1.50	1.50
Network administrator	60	20.00	15.00	6.00	1.50	1.50
Lawyer	150	16.00	12.00	4.00	1.00	1.00
R&D manager	90	8.00	6.00	2.00	0.50	0.50
Total hours per facility	n/a	**260.00**	**195.00**	**131.50**	**32.88**	**32.88**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$10,000**	**$2,500**	**$2,500**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 9. SVA/SSP Assumptions for Group B – Tier 4 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	36.00	27.00	24.50	6.13	6.13
Corporate Security Officer	100	16.00	12.00	5.50	1.38	1.38
Technical Staff	70	20.00	15.00	13.00	3.25	3.25
EHS	60	14.00	10.50	11.00	2.75	2.75
Clerical Staff	40	14.00	10.50	2.75	0.69	0.69
Sr. Management	80	8.00	6.00	3.00	0.75	0.75
Network administrator	60	6.00	4.50	3.00	0.75	0.75
Lawyer	150	20.00	15.00	2.00	0.50	0.50
R&D manager	90	8.00	6.00	1.00	0.25	0.25
Total hours per facility	n/a	**142.00**	**106.50**	**65.75**	**16.44**	**16.44**
Total ($ per facility)	n/a	**$12,000**	**$9,000**	**$5,000**	**$1,250**	**$1,250**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 10. SVA/SSP Assumptions for Group C – Tier 1 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 11. SVA/SSP Assumptions for Group C – Tier 2 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 12. SVA/SSP Assumptions for Group C – Tier 3 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	49.00	12.25	12.25
Corporate Security Officer	100	24.00	18.00	11.00	2.75	2.75
Technical Staff	70	42.00	31.50	26.00	6.50	6.50
EHS	60	34.00	25.50	22.00	5.50	5.50
Clerical Staff	40	24.00	18.00	5.50	1.38	1.38
Sr. Management	80	12.00	9.00	6.00	1.50	1.50
Network administrator	60	20.00	15.00	6.00	1.50	1.50
Lawyer	150	16.00	12.00	4.00	1.00	1.00
R&D manager	90	8.00	6.00	2.00	0.50	0.50
Total hours per facility	n/a	**260.00**	**195.00**	**131.50**	**32.88**	**32.88**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$10,000**	**$2,500**	**$2,500**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 13. SVA/SSP Assumptions for Group C – Tier 4 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	36.00	27.00	24.50	6.13	6.13
Corporate Security Officer	100	16.00	12.00	5.50	1.38	1.38
Technical Staff	70	20.00	15.00	13.00	3.25	3.25
EHS	60	14.00	10.50	11.00	2.75	2.75
Clerical Staff	40	14.00	10.50	2.75	0.69	0.69
Sr. Management	80	8.00	6.00	3.00	0.75	0.75
Network administrator	60	6.00	4.50	3.00	0.75	0.75
Lawyer	150	20.00	15.00	2.00	0.50	0.50
R&D manager	90	8.00	6.00	1.00	0.25	0.25
Total hours per facility	n/a	**142.00**	**106.50**	**65.75**	**16.44**	**16.44**
Total ($ per facility)	n/a	**$12,000**	**$9,000**	**$5,000**	**$1,250**	**$1,250**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 14. SVA/SSP Assumptions for Theft & Diversion – Tier 1 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 15. SVA/SSP Assumptions for Theft & Diversion – Tier 2 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	98.00	24.50	24.50
Corporate Security Officer	100	24.00	18.00	22.00	5.50	5.50
Technical Staff	70	42.00	31.50	52.00	13.00	13.00
EHS	60	34.00	25.50	44.00	11.00	11.00
Clerical Staff	40	24.00	18.00	11.00	2.75	2.75
Sr. Management	80	12.00	9.00	12.00	3.00	3.00
Network administrator	60	20.00	15.00	12.00	3.00	3.00
Lawyer	150	16.00	12.00	8.00	2.00	2.00
R&D manager	90	8.00	6.00	4.00	1.00	1.00
Total hours per facility	n/a	**260.00**	**195.00**	**263.00**	**65.75**	**65.75**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$20,000**	**$5,000**	**$5,000**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 16. SVA/SSP Assumptions for Theft & Diversion – Tier 3 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	80.00	60.00	49.00	12.25	12.25
Corporate Security Officer	100	24.00	18.00	11.00	2.75	2.75
Technical Staff	70	42.00	31.50	26.00	6.50	6.50
EHS	60	34.00	25.50	22.00	5.50	5.50
Clerical Staff	40	24.00	18.00	5.50	1.38	1.38
Sr. Management	80	12.00	9.00	6.00	1.50	1.50
Network administrator	60	20.00	15.00	6.00	1.50	1.50
Lawyer	150	16.00	12.00	4.00	1.00	1.00
R&D manager	90	8.00	6.00	2.00	0.50	0.50
Total hours per facility	n/a	**260.00**	**195.00**	**131.50**	**32.88**	**32.88**
Total ($ per facility)	n/a	**$20,020**	**$15,015**	**$10,000**	**$2,500**	**$2,500**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 17. SVA/SSP Assumptions for Theft & Diversion – Tier 4 Facilities

	Average Hourly Rate (inc. 40% benefits)	Hours				
		New SVA	Review/ Update SVA	New SSP	DHS Required Revisions	Review/ Update SSP
SSO	80	36.00	27.00	24.50	6.13	6.13
Corporate Security Officer	100	16.00	12.00	5.50	1.38	1.38
Technical Staff	70	20.00	15.00	13.00	3.25	3.25
EHS	60	14.00	10.50	11.00	2.75	2.75
Clerical Staff	40	14.00	10.50	2.75	0.69	0.69
Sr. Management	80	8.00	6.00	3.00	0.75	0.75
Network administrator	60	6.00	4.50	3.00	0.75	0.75
Lawyer	150	20.00	15.00	2.00	0.50	0.50
R&D manager	90	8.00	6.00	1.00	0.25	0.25
Total hours per facility	n/a	**142.00**	**106.50**	**65.75**	**16.44**	**16.44**
Total ($ per facility)	n/a	**$12,000**	**$9,000**	**$5,000**	**$1,250**	**$1,250**

Note: for ease of analysis, total cost per facility has been rounded in some cases.
* Review and update of an existing SVA is assumed to be 75% of the time/cost of conducting a new SVA.
** Review and update of an existing SSP and DHS required revisions to a facility's SSP are each assumed to be 25% of the time/cost of conducting a new SSP.

Appendix E Table 18. SSP Hearings and Appeals

	Average Hourly Rate (inc. 40% benefits)	Hours
SSO	80	16.0
Corporate Security Officer	100	8.0
Technical Staff	70	2.0
EHS	60	2.0
Clerical Staff	40	2.0
Sr. Management	80	4.0
Lawyer	150	16.0
Total hours per facility	n/a	**50.0**
Total hours per facility less SSO time*	n/a	**34.0**
Total ($ per facility)	n/a	**$3,860**

* The cost of the SSO's time is accounted for in the SSO cost.

Appendix E Table 19. Audits

	SSO	Corporate Security Officer	EHS	HR Manager	Transp/ Logistics Mgr	Network admin.	Lawyer	Total Hours	Total Non-SSO hours	Total non-SSO cost for audits
Hourly Rate	$80	$100	$60	$90	$80	$60	$150	n/a	n/a	n/a
Tier 1 Group A	40	40	40	4	4	4	4	136	96	$7,900
Tier 1 Group B	24	24	24	3	3	3	3	84	60	5,000
Tier 1 Group C	24	24	24	3	3	3	3	84	60	5,000
Tier 1 Theft	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Group A	40	40	40	4	4	4	4	136	96	7,900
Tier 2 Group B	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Group C	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Theft	24	24	24	3	3	3	3	84	60	5,000
Tier 3 Group A	32	32	32	3	3	3	3	108	76	6,300
Tier 3 Group B	16	16	16	2	2	2	2	56	40	3,300
Tier 3 Group C	16	16	16	2	2	2	2	56	40	3,300
Tier 3 Theft	16	16	16	2	2	2	2	56	40	3,300
Tier 4 Group A	24	24	24	2	2	2	2	80	56	4,600
Tier 4 Group B	8	8	8	1	1	1	1	28	20	1,700
Tier 4 Group C	8	8	8	1	1	1	1	28	20	1,700
Tier 4 Theft	8	8	8	1	1	1	1	28	20	1,700

Appendix E Table 20. Inspections

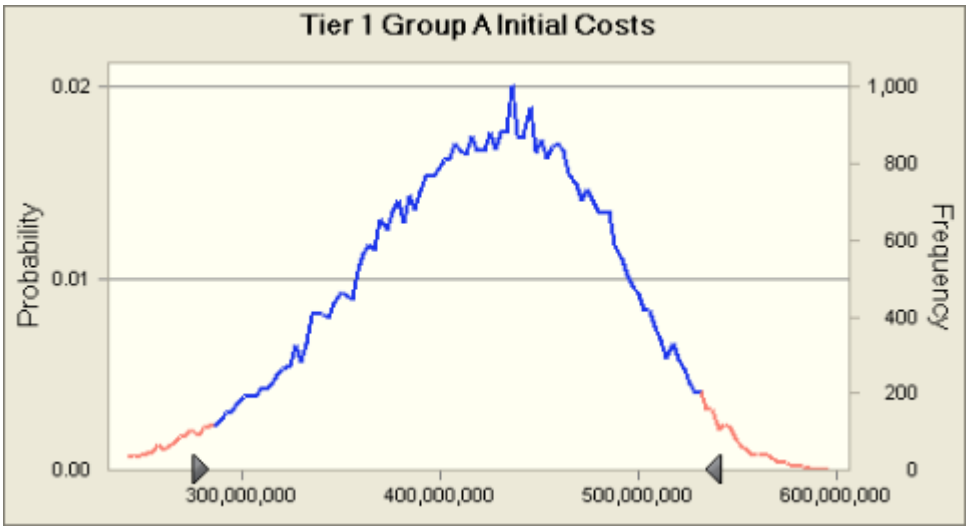
	SSO	Corporate Security Officer	EHS	HR Manager	Transp/ Logistics Mgr	Network admin.	Lawyer	Total Hours	Total Non-SSO hours	Total non-SSO cost for audits
Hourly Rate	$80	$100	$60	$90	$80	$60	$150	n/a	n/a	n/a
Tier 1 Group A	40	40	40	4	4	4	4	136	96	$7,900
Tier 1 Group B	24	24	24	3	3	3	3	84	60	5,000
Tier 1 Group C	24	24	24	3	3	3	3	84	60	5,000
Tier 1 Theft	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Group A	40	40	40	4	4	4	4	136	96	7,900
Tier 2 Group B	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Group C	24	24	24	3	3	3	3	84	60	5,000
Tier 2 Theft	24	24	24	3	3	3	3	84	60	5,000
Tier 3 Group A	32	32	32	3	3	3	3	108	76	6,300
Tier 3 Group B	16	16	16	2	2	2	2	56	40	3,300
Tier 3 Group C	16	16	16	2	2	2	2	56	40	3,300
Tier 3 Theft	16	16	16	2	2	2	2	56	40	3,300
Tier 4 Group A	24	24	24	2	2	2	2	80	56	4,600
Tier 4 Group B	8	8	8	1	1	1	1	28	20	1,700
Tier 4 Group C	8	8	8	1	1	1	1	28	20	1,700
Tier 4 Theft	8	8	8	1	1	1	1	28	20	1,700

Appendix F. Results from the Monte Carlo Analysis

Tier 1 Group A Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 284,461,458 to 531,273,799
Entire range is from 171,817,838 to 632,856,788
Base case is 429,871,247
After 50,000 trials, the std. error of the mean is 284,100



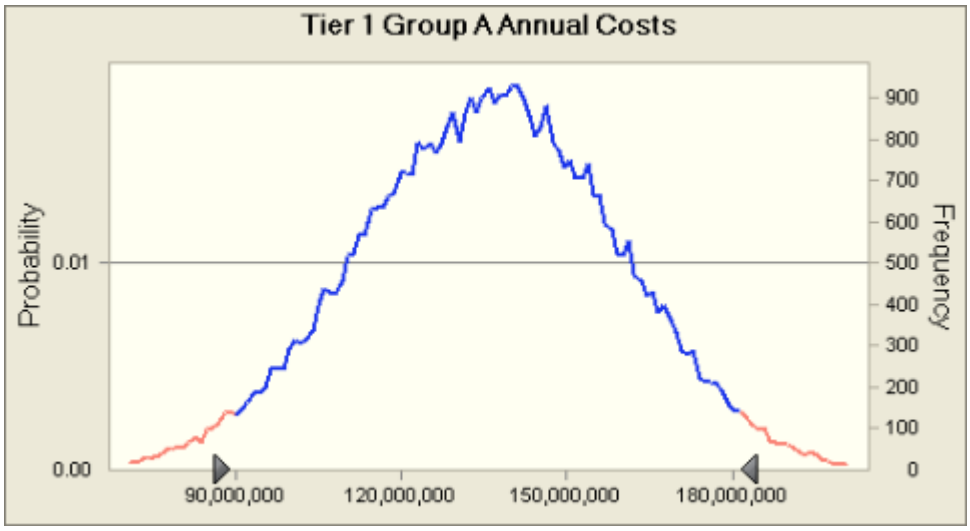
Statistics:	Forecast values
Trials	50,000
Mean	419,087,003
Median	423,345,389
Mode	---
Standard Deviation	63,526,697
Variance	4,035,641,221,433,370
Skewness	-0.3124
Kurtosis	2.86
Coeff. of Variability	0.1516
Minimum	171,817,838
Maximum	632,856,788
Range Width	461,038,950
Mean Std. Error	284,100

Percentiles:	Forecast values
0%	171,817,838
10%	334,384,984
20%	365,519,259
30%	387,428,250
40%	406,151,261
50%	423,345,389
60%	439,437,155
70%	456,154,420
80%	474,649,131
90%	498,197,465
100%	632,856,788

Tier 1 Group A Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 89,244,938 to 180,781,007
Entire range is from 50,874,542 to 219,269,552
Base case is 142,474,023



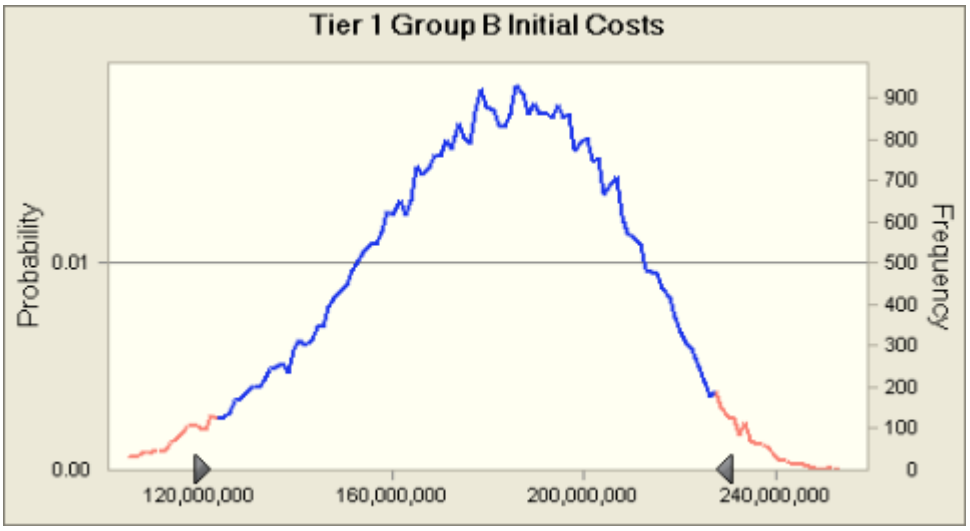
Statistics:	Forecast values
Trials	50,000
Mean	135,696,867
Median	136,032,606
Mode	---
Standard Deviation	23,370,619
Variance	546,185,812,187,319
Skewness	-0.0379
Kurtosis	2.85
Coeff. of Variability	0.1722
Minimum	50,874,542
Maximum	219,269,552
Range Width	168,395,010
Mean Std. Error	104,517

Percentiles:	Forecast values
0%	50,874,542
10%	105,386,112
20%	115,693,368
30%	123,313,519
40%	129,951,908
50%	136,032,606
60%	141,866,506
70%	148,209,998
80%	155,599,608
90%	165,801,565
100%	219,269,552

Tier 1 Group B Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 122,504,350 to 226,718,932
Entire range is from 77,636,672 to 261,044,963
Base case is 185,428,137



Statistics:

	Forecast values
Trials	50,000
Mean	179,872,183
Median	181,658,044
Mode	---
Standard Deviation	26,898,827
Variance	723,546,874,464,123
Skewness	-0.3425
Kurtosis	2.85
Coeff. of Variability	0.1495
Minimum	77,636,672
Maximum	261,044,963
Range Width	183,408,291
Mean Std. Error	120,295

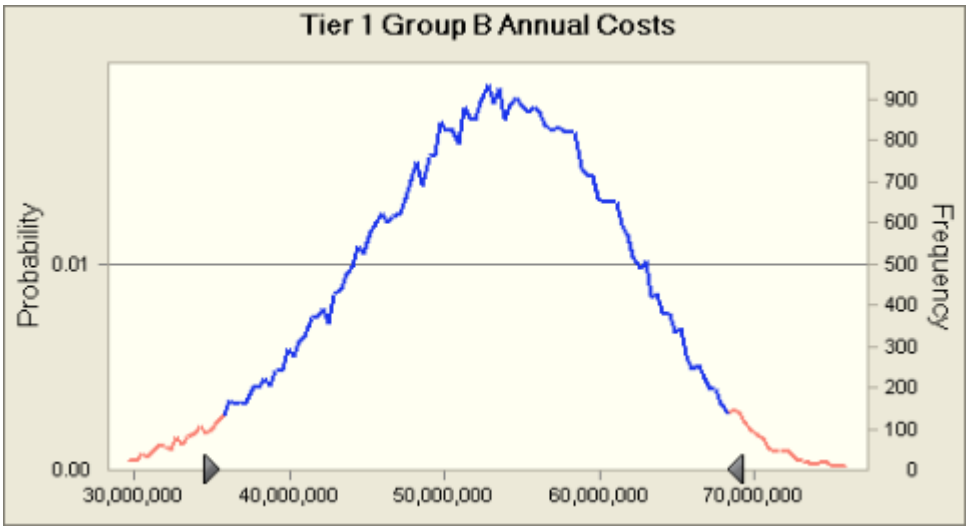
Percentiles:

	Forecast values
0%	77,636,672
10%	143,585,501
20%	157,127,606
30%	166,619,182
40%	174,514,792
50%	181,658,044
60%	188,711,158
70%	195,769,055
80%	203,454,191
90%	213,435,875
100%	261,044,963

Tier 1 Group B Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 35,639,131 to 67,913,134
Entire range is from 21,070,543 to 80,754,800
Base case is
54,646,360
After 50,000 trials, the std. error of the mean is 37,148



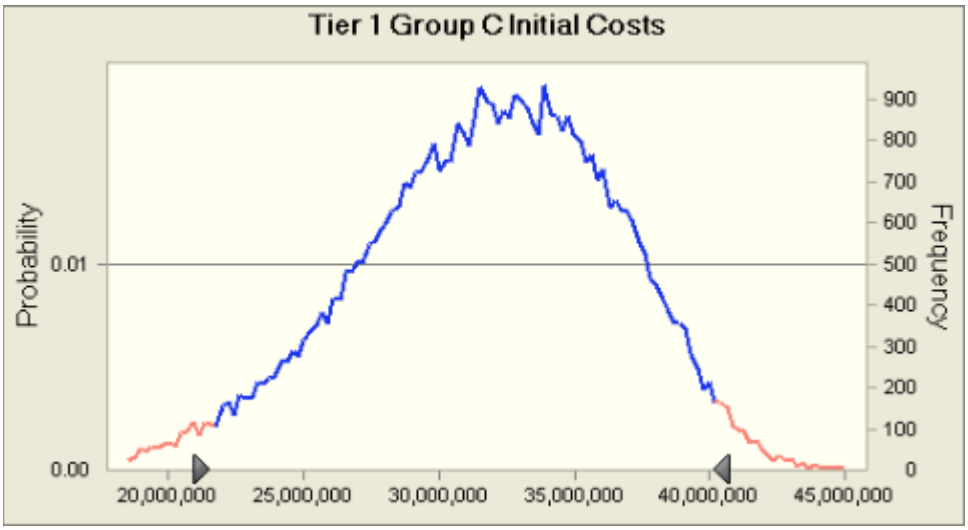
Statistics:	Forecast values
Trials	50,000
Mean	52,753,143
Median	53,106,758
Mode	---
Standard Deviation	8,306,559
Variance	68,998,924,752,933
Skewness	-0.2082
Kurtosis	2.86
Coeff. of Variability	0.1575
Minimum	21,070,543
Maximum	80,754,800
Range Width	59,684,257
Mean Std. Error	37,148

Percentiles:	Forecast values
0%	21,070,543
10%	41,697,883
20%	45,682,529
30%	48,577,671
40%	50,964,692
50%	53,106,758
60%	55,233,937
70%	57,454,969
80%	59,929,256
90%	63,178,091
100%	80,754,800

Tier 1 Group C Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 21,588,086 to 39,998,905
Entire range is from 12,210,076 to 45,796,270
Base case is
32,789,543
After 50,000 trials, the std. error of the mean is 21,272



Statistics:

	Forecast values
Trials	50,000
Mean	31,739,639
Median	32,046,051
Mode	---
Standard Deviation	4,756,585
Variance	22,625,099,970,390
Skewness	-0.3438
Kurtosis	2.87
Coeff. of Variability	0.1499
Minimum	12,210,076
Maximum	45,796,270
Range Width	33,586,194
Mean Std. Error	21,272

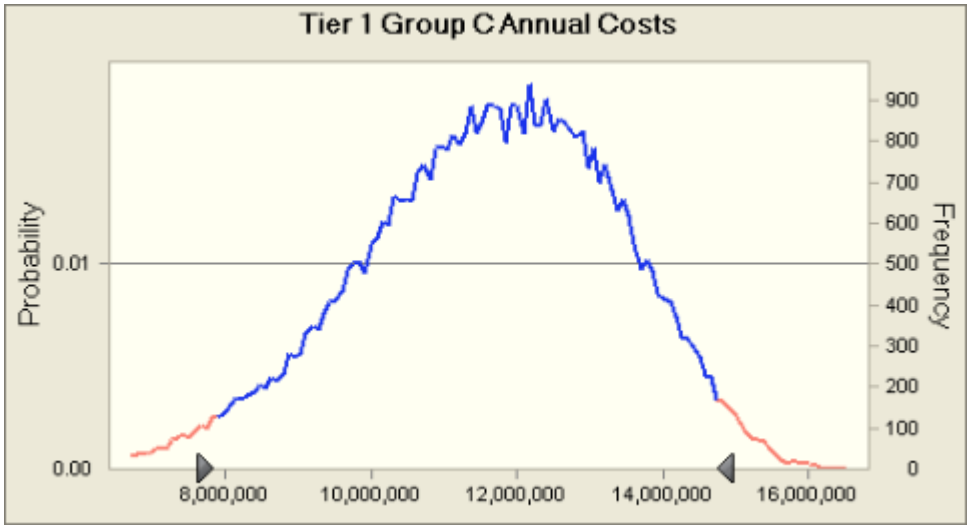
Percentiles:

	Forecast values
0%	12,210,076
10%	25,353,212
20%	27,738,271
30%	29,383,184
40%	30,793,086
50%	32,046,051
60%	33,286,669
70%	34,552,757
80%	35,923,523
90%	37,643,230
100%	45,796,270

Tier 1 Group C Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 7,859,450 to 14,693,989
Entire range is from 4,687,313 to 16,610,134
Base case is
12,378,648



Statistics:

	Forecast values
Trials	50,000
Mean	11,604,158
Median	11,712,866
Mode	---
Standard Deviation	1,767,823
Variance	3,125,197,240,324
Skewness	-0.3262
Kurtosis	2.84
Coeff. of Variability	0.1523
Minimum	4,687,313
Maximum	16,610,134
Range Width	11,922,822
Mean Std. Error	7,906

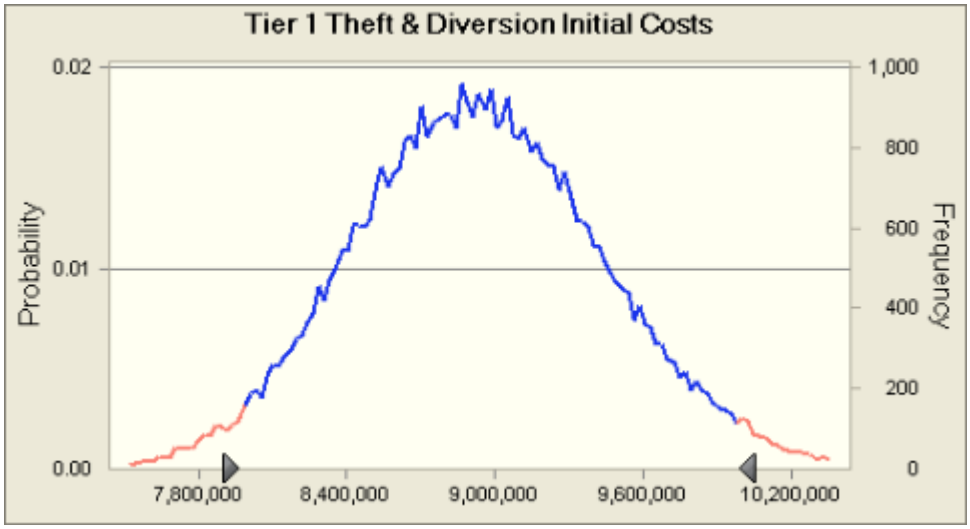
Percentiles:

	Forecast values
0%	4,687,313
10%	9,238,435
20%	10,110,319
30%	10,723,695
40%	11,242,421
50%	11,712,866
60%	12,177,624
70%	12,648,638
80%	13,158,787
90%	13,817,340
100%	16,610,134

Tier 1 Theft & Diversion Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 7,977,169 to 9,964,836
Entire range is from 6,737,986 to 11,781,890
Base case is
9,135,403
After 50,000 trials, the std. error of the mean is 2,272



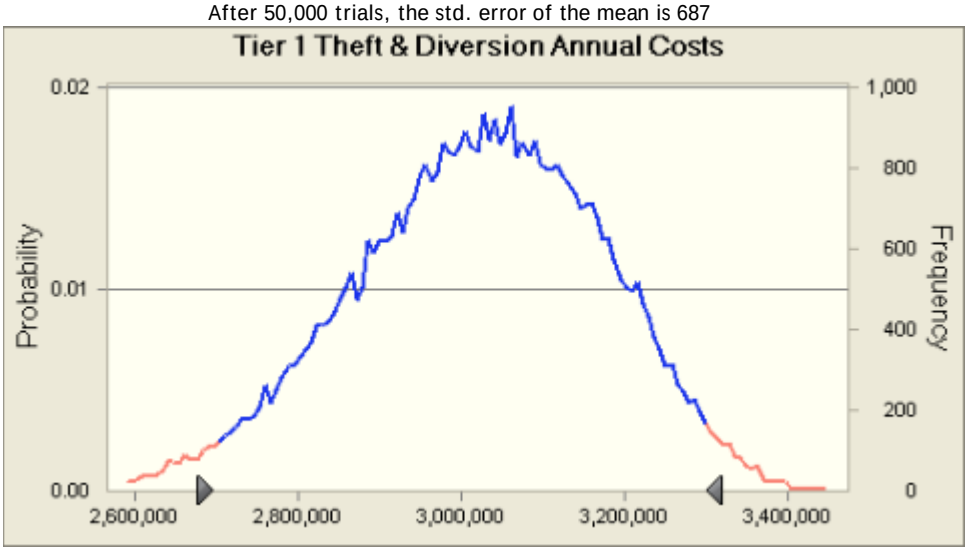
Statistics:	Forecast values
Trials	50,000
Mean	8,934,188
Median	8,923,422
Mode	---
Standard Deviation	508,092
Variance	258,157,214,925
Skewness	0.1372
Kurtosis	3.03
Coeff. of Variability	0.0569
Minimum	6,737,986
Maximum	11,781,890
Range Width	5,043,904
Mean Std. Error	2,272

Percentiles:	Forecast values
0%	6,737,986
10%	8,291,569
20%	8,503,551
30%	8,658,288
40%	8,793,867
50%	8,923,422
60%	9,050,834
70%	9,191,948
80%	9,356,341
90%	9,593,949
100%	11,781,890

Tier 1 Theft & Diversion Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 2,700,390 to 3,293,651
Entire range is from 2,260,581 to 3,500,617
Base case is
3,183,182
After 50,000 trials, the std. error of the mean is 687



Statistics:

	Forecast values
Trials	50,000
Mean	3,019,261
Median	3,026,943
Mode	---
Standard Deviation	153,689
Variance	23,620,310,018
Skewness	-0.2872
Kurtosis	2.91
Coeff. of Variability	0.0509
Minimum	2,260,581
Maximum	3,500,617
Range Width	1,240,036
Mean Std. Error	687

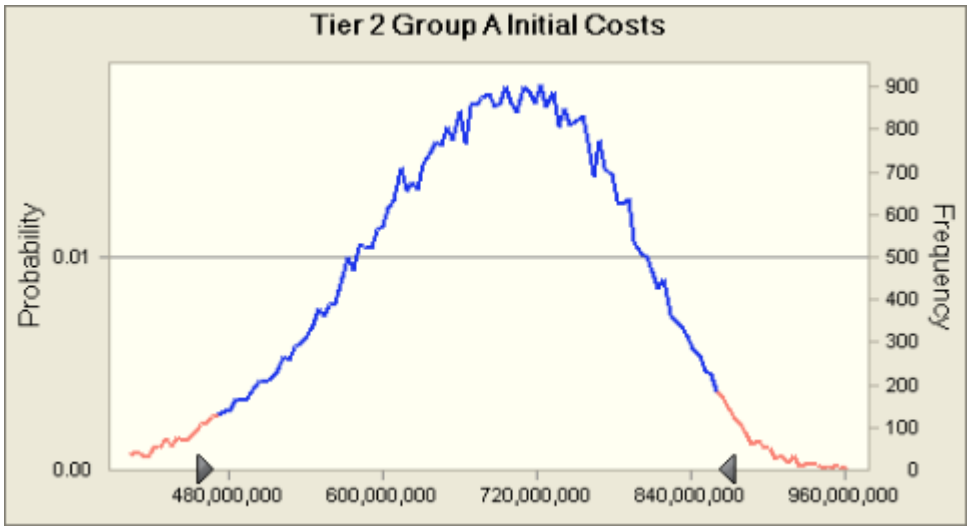
Percentiles:

	Forecast values
0%	2,260,581
10%	2,814,752
20%	2,888,982
30%	2,943,083
40%	2,986,735
50%	3,026,943
60%	3,065,992
70%	3,107,961
80%	3,154,208
90%	3,213,257
100%	3,500,617

Tier 2 Group A Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 469,902,411 to 857,925,156
Entire range is from 277,058,818 to 980,532,121
Base case is 688,781,644



Statistics:

	Forecast values
Trials	50,000
Mean	682,022,389
Median	688,431,330
Mode	---
Standard Deviation	100,432,685
Variance	10,086,724,309,603,700
Skewness	-0.3182
Kurtosis	2.86
Coeff. of Variability	0.1473
Minimum	277,058,818
Maximum	980,532,121
Range Width	703,473,304
Mean Std. Error	449,149

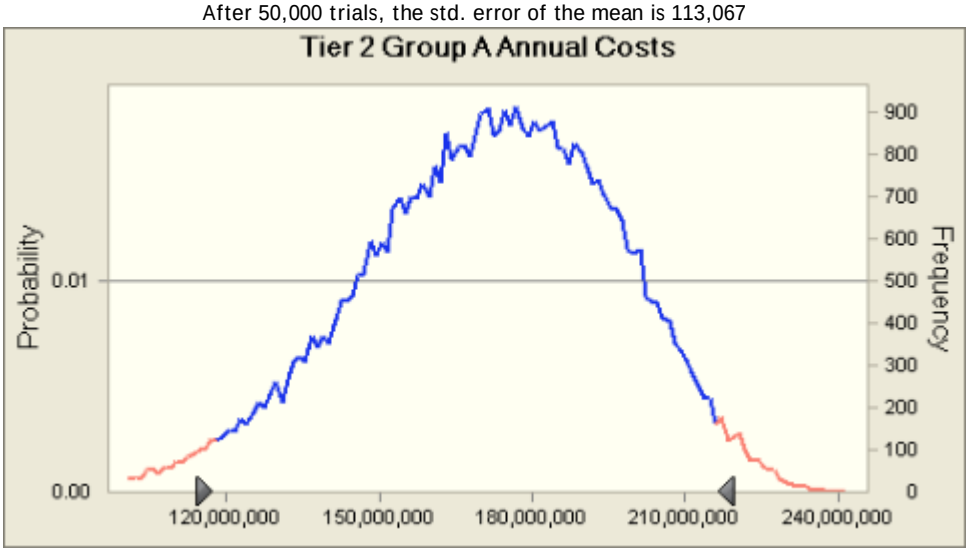
Percentiles:

	Forecast values
0%	277,058,818
10%	547,589,571
20%	597,093,808
30%	632,097,867
40%	661,479,007
50%	688,431,330
60%	714,539,479
70%	741,009,124
80%	769,929,503
90%	807,479,626
100%	980,532,121

Tier 2 Group A Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 117,721,344 to 215,767,843
Entire range is from 72,890,088 to 248,020,507
Base case is 176,610,928
After 50,000 trials, the std. error of the mean is 113,067



Statistics:

	Forecast values
Trials	50,000
Mean	171,148,084
Median	172,684,199
Mode	---
Standard Deviation	25,282,491
Variance	639,204,327,870,924
Skewness	-0.3152
Kurtosis	2.85
Coeff. of Variability	0.1477
Minimum	72,890,088
Maximum	248,020,507
Range Width	175,130,419
Mean Std. Error	113,067

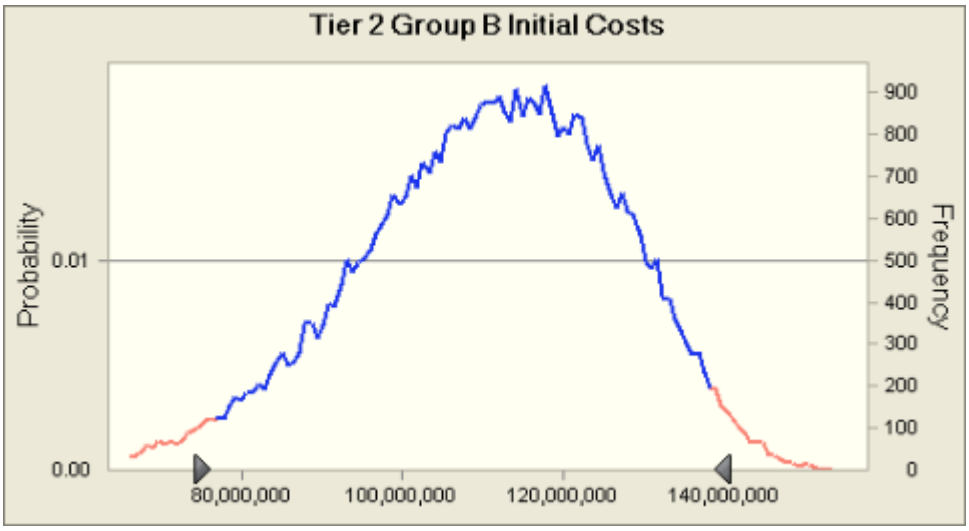
Percentiles:

	Forecast values
0%	72,890,088
10%	137,158,151
20%	149,789,508
30%	158,504,504
40%	165,947,222
50%	172,684,199
60%	179,280,792
70%	185,956,013
80%	193,357,155
90%	202,730,079
100%	248,020,507

Tier 2 Group B Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 76,439,997 to 138,249,391
Entire range is from 49,516,511 to 161,642,885
Base case is 113,702,460



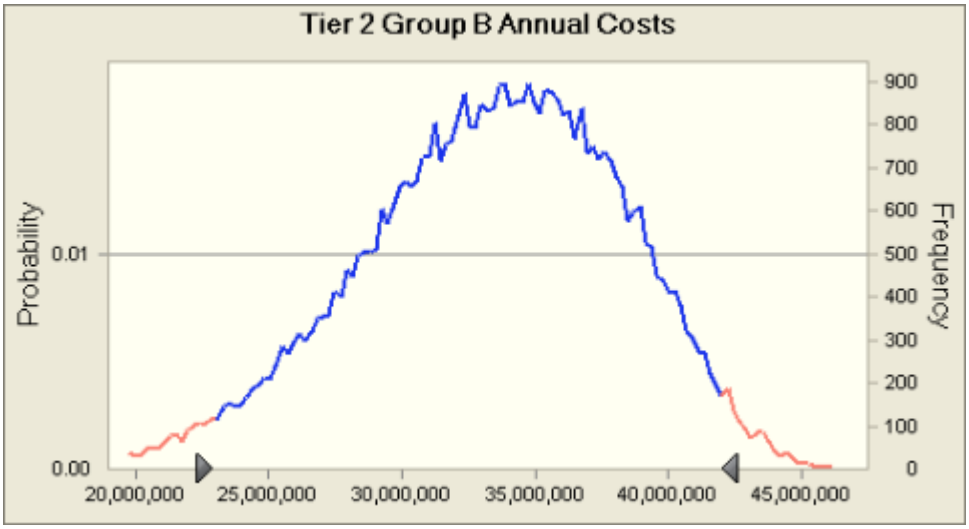
Statistics:	Forecast values
Trials	50,000
Mean	110,553,218
Median	111,632,140
Mode	---
Standard Deviation	16,018,464
Variance	256,591,184,739,204
Skewness	-0.3534
Kurtosis	2.85
Coeff. of Variability	0.1449
Minimum	49,516,511
Maximum	161,642,885
Range Width	112,126,374
Mean Std. Error	71,637

Percentiles:	Forecast values
0%	49,516,511
10%	88,954,354
20%	97,060,152
30%	102,648,362
40%	107,357,360
50%	111,632,140
60%	115,833,148
70%	120,077,282
80%	124,664,347
90%	130,528,654
100%	161,642,885

Tier 2 Group B Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 22,954,587 to 41,830,365
Entire range is from 14,602,931 to 46,721,238
Base case is
35,089,808



Statistics:

	Forecast values
Trials	50,000
Mean	33,323,318
Median	33,646,559
Mode	---
Standard Deviation	4,879,279
Variance	23,807,359,642,391
Skewness	-0.3324
Kurtosis	2.83
Coeff. of Variability	0.1464
Minimum	14,602,931
Maximum	46,721,238
Range Width	32,118,307
Mean Std. Error	21,821

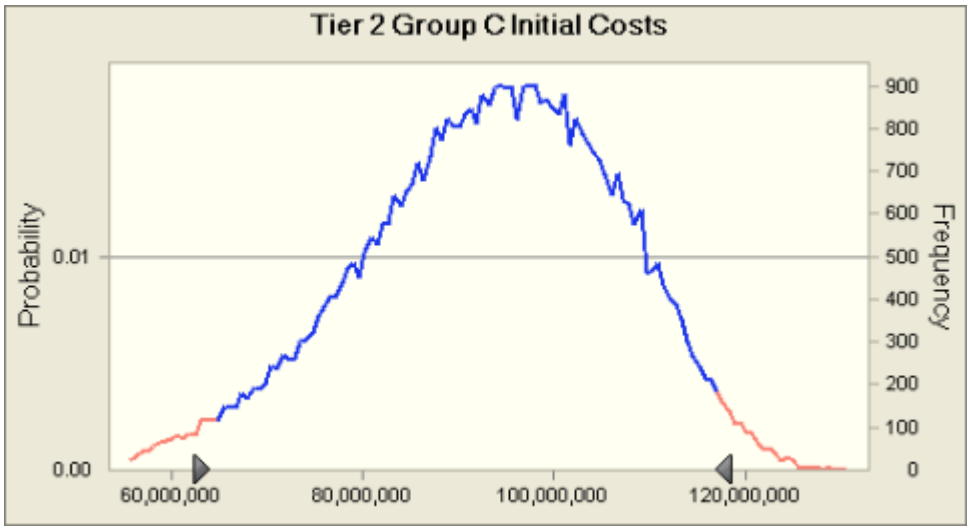
Percentiles:

	Forecast values
0%	14,602,931
10%	26,731,543
20%	29,210,831
30%	30,906,563
40%	32,325,324
50%	33,646,559
60%	34,905,254
70%	36,199,165
80%	37,622,673
90%	39,409,529
100%	46,721,238

Tier 2 Group C Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 64,254,331 to 116,515,155
Entire range is from 40,561,518 to 132,392,101
Base case is
97,179,125
After 50,000 trials, the std. error of the mean is 60,335



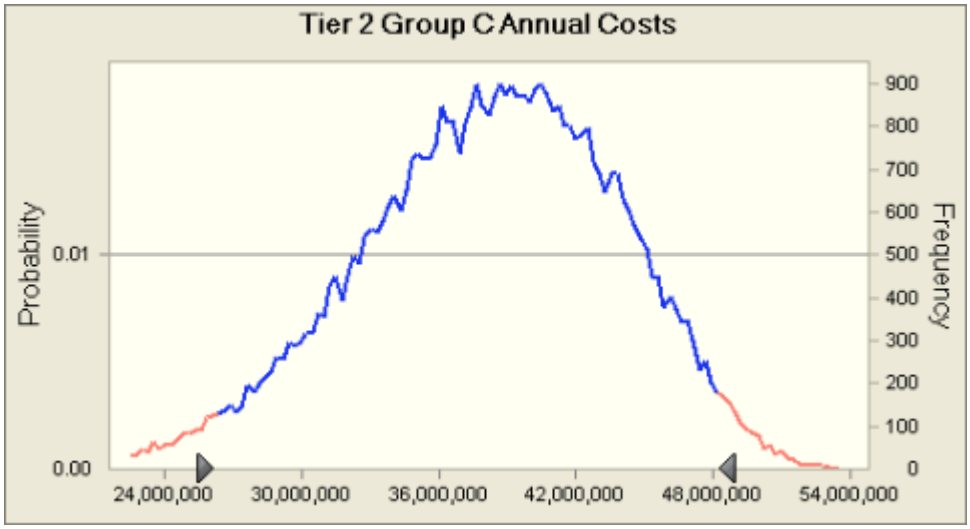
Statistics:	Forecast values
Trials	50,000
Mean	93,095,355
Median	94,015,521
Mode	---
Standard Deviation	13,491,350
Variance	182,016,527,628,572
Skewness	-0.3517
Kurtosis	2.87
Coeff. of Variability	0.1449
Minimum	40,561,518
Maximum	132,392,101
Range Width	91,830,583
Mean Std. Error	60,335

Percentiles:	Forecast values
0%	40,561,518
10%	74,981,712
20%	81,751,954
30%	86,526,300
40%	90,431,528
50%	94,015,521
60%	97,489,585
70%	101,019,501
80%	104,968,652
90%	109,898,802
100%	132,392,101

Tier 2 Group C Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 26,246,387 to 48,089,713
Entire range is from 16,402,999 to 54,822,479
Base case is
40,937,560



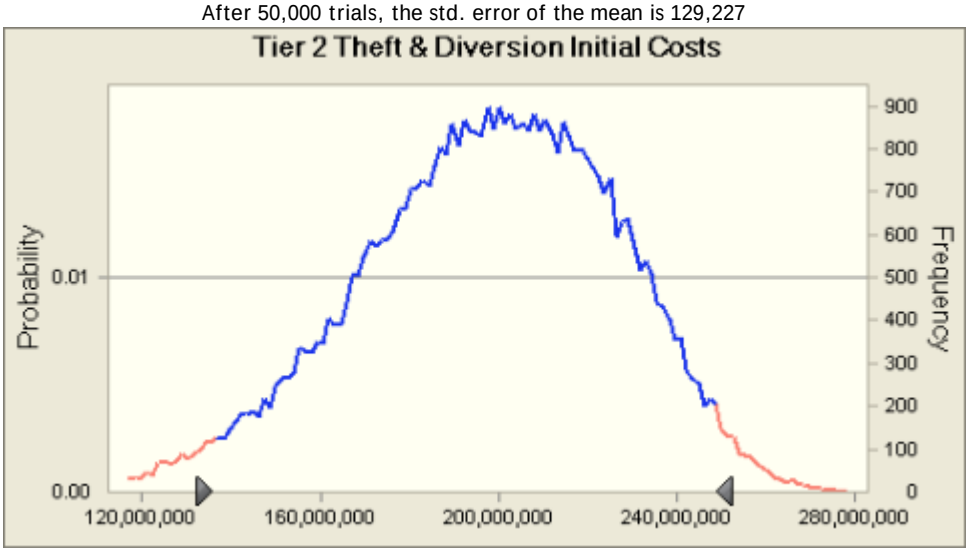
Statistics:	Forecast values
Trials	50,000
Mean	38,150,672
Median	38,503,095
Mode	---
Standard Deviation	5,645,938
Variance	31,876,620,266,428
Skewness	-0.3100
Kurtosis	2.83
Coeff. of Variability	0.1480
Minimum	16,402,999
Maximum	54,822,479
Range Width	38,419,480
Mean Std. Error	25,249

Percentiles:	Forecast values
0%	16,402,999
10%	30,580,716
20%	33,370,476
30%	35,342,851
40%	36,984,140
50%	38,503,095
60%	39,962,415
70%	41,440,955
80%	43,119,332
90%	45,222,540
100%	54,822,479

Tier 2 Theft & Diversion Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 136,110,569 to 247,914,881
Entire range is from 83,371,730 to 293,577,625
Base case is 199,107,276
After 50,000 trials, the std. error of the mean is 129,227



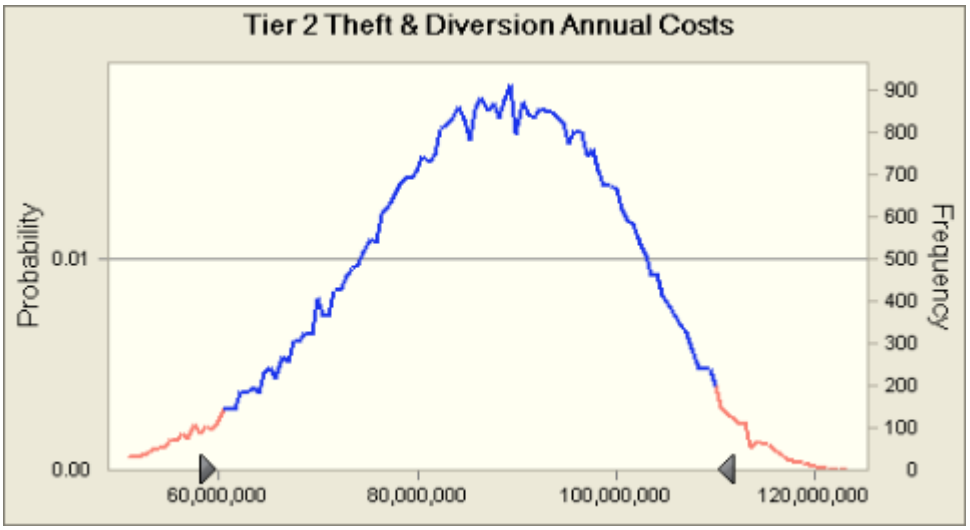
Statistics:	Forecast values
Trials	50,000
Mean	197,381,307
Median	199,113,881
Mode	---
Standard Deviation	28,895,984
Variance	834,977,872,142,290
Skewness	-0.3208
Kurtosis	2.86
Coeff. of Variability	0.1464
Minimum	83,371,730
Maximum	293,577,625
Range Width	210,205,895
Mean Std. Error	129,227

Percentiles:	Forecast values
0%	83,371,730
10%	158,571,386
20%	172,949,073
30%	183,015,513
40%	191,422,044
50%	199,113,881
60%	206,702,263
70%	214,502,523
80%	222,776,989
90%	233,428,120
100%	293,577,625

Tier 2 Theft & Diversion Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 59,883,525 to 109,752,663
Entire range is from 36,264,900 to 123,652,795
Base case is
91,724,893
After 50,000 trials, the std. error of the mean is 57,938



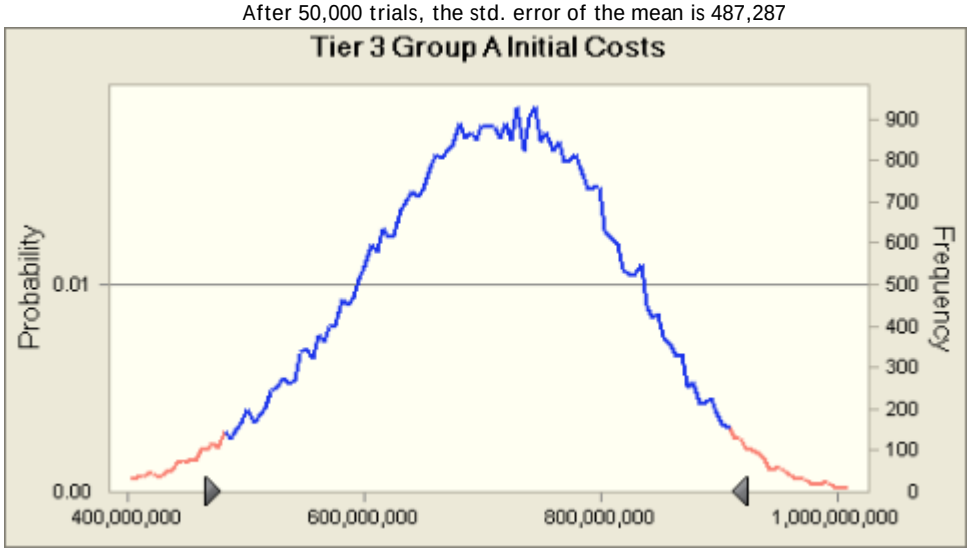
Statistics:	Forecast values
Trials	50,000
Mean	86,987,842
Median	87,666,649
Mode	---
Standard Deviation	12,955,402
Variance	167,842,449,464,602
Skewness	-0.2954
Kurtosis	2.82
Coeff. of Variability	0.1489
Minimum	36,264,900
Maximum	123,652,795
Range Width	87,387,895
Mean Std. Error	57,938

Percentiles:	Forecast values
0%	36,264,900
10%	69,636,371
20%	76,081,873
30%	80,474,581
40%	84,184,899
50%	87,666,649
60%	91,100,752
70%	94,578,344
80%	98,413,525
90%	103,266,103
100%	123,652,795

Tier 3 Group A Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 480,908,747 to 906,947,349
Entire range is from 304,703,220 to 1,117,422,665
Base case is 706,650,159
After 50,000 trials, the std. error of the mean is 487,287



Statistics:

	Forecast values
Trials	50,000
Mean	705,210,747
Median	709,229,721
Mode	---
Standard Deviation	108,960,705
Variance	11,872,435,283,555,700
Skewness	-0.1783
Kurtosis	2.88
Coeff. of Variability	0.1545
Minimum	304,703,220
Maximum	1,117,422,665
Range Width	812,719,444
Mean Std. Error	487,287

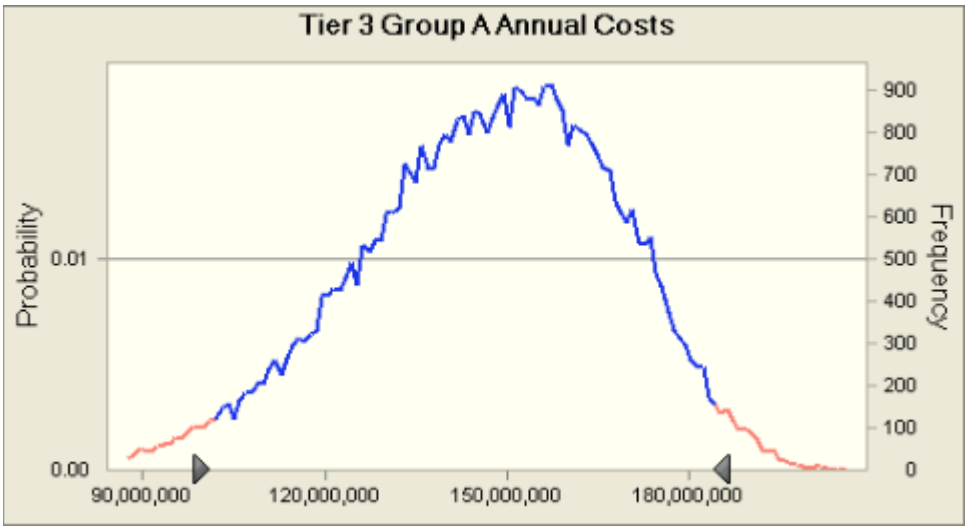
Percentiles:

	Forecast values
0%	304,703,220
10%	560,958,562
20%	613,367,347
30%	650,141,529
40%	680,738,047
50%	709,229,721
60%	737,682,452
70%	766,277,120
80%	798,295,460
90%	842,122,418
100%	1,117,422,665

Tier 3 Group A Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 101,375,599 to 183,307,884
Entire range is from 65,041,818 to 215,104,008
Base case is 147,495,645



Statistics:

	Forecast values
Trials	50,000
Mean	146,565,282
Median	148,147,693
Mode	---
Standard Deviation	21,204,313
Variance	449,622,888,722,863
Skewness	-0.3531
Kurtosis	2.87
Coeff. of Variability	0.1447
Minimum	65,041,818
Maximum	215,104,008
Range Width	150,062,190
Mean Std. Error	94,829

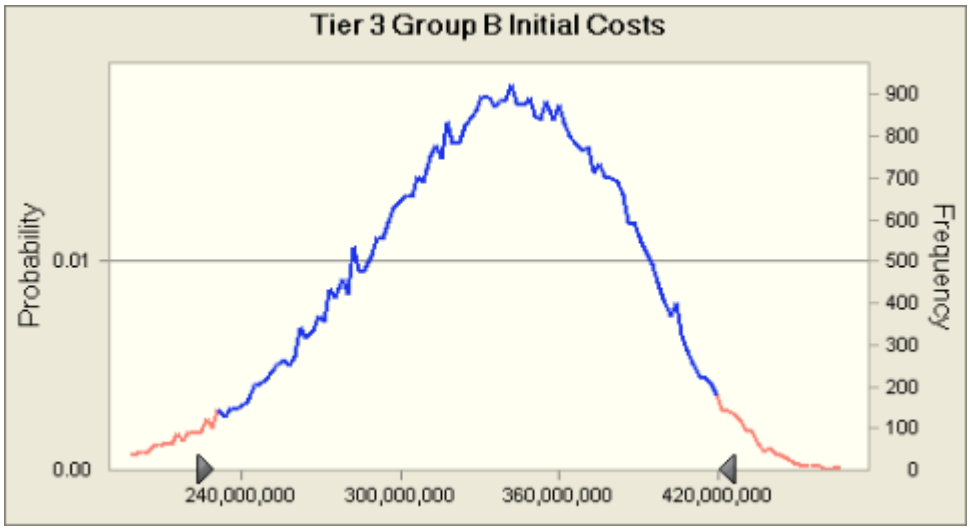
Percentiles:

	Forecast values
0%	65,041,818
10%	118,052,514
20%	128,667,975
30%	136,050,155
40%	142,319,087
50%	148,147,693
60%	153,629,650
70%	159,070,149
80%	165,152,709
90%	172,863,170
100%	215,104,008

Tier 3 Group B Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 229,980,615 to 418,570,158
Entire range is from 137,052,184 to 474,831,419
Base case is 332,290,028



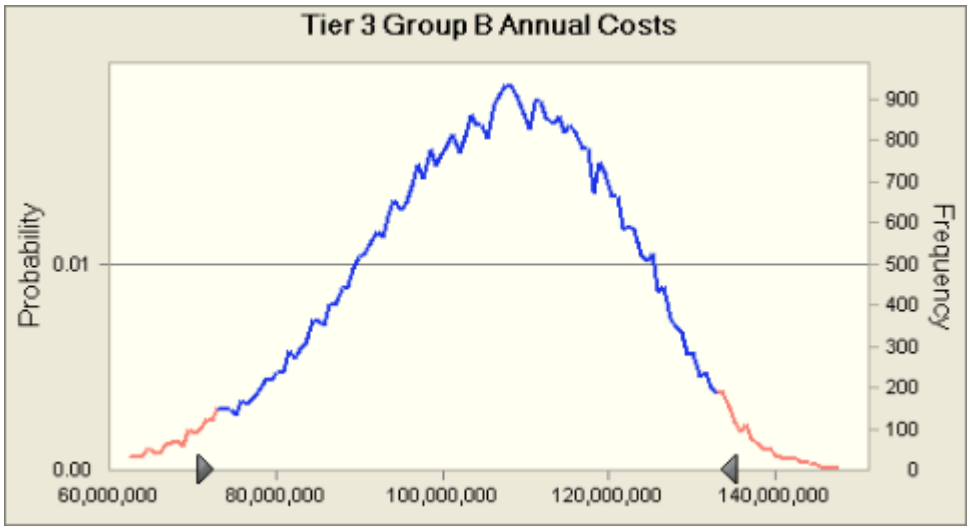
Statistics:	Forecast values
Trials	50,000
Mean	333,177,467
Median	336,336,502
Mode	---
Standard Deviation	48,701,684
Variance	2,371,854,041,727,880
Skewness	-0.3275
Kurtosis	2.86
Coeff. of Variability	0.1462
Minimum	137,052,184
Maximum	474,831,419
Range Width	337,779,235
Mean Std. Error	217,801

Percentiles:	Forecast values
0%	137,052,184
10%	267,626,954
20%	292,008,905
30%	309,303,771
40%	323,550,703
50%	336,336,502
60%	348,745,848
70%	361,687,864
80%	376,109,172
90%	393,716,779
100%	474,831,419

Tier 3 Group B Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 72,692,959 to 132,871,522
Entire range is from 43,359,033 to 155,139,691
Base case is 106,749,336
After 50,000 trials, the std. error of the mean is 69,301



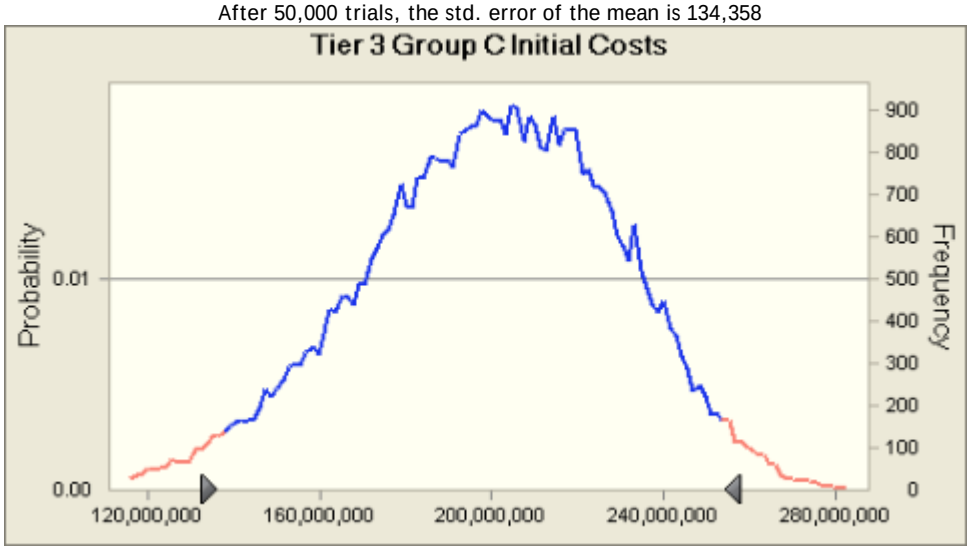
Statistics:	Forecast values
Trials	50,000
Mean	105,493,329
Median	106,535,764
Mode	---
Standard Deviation	15,496,278
Variance	240,134,620,981,615
Skewness	-0.3122
Kurtosis	2.86
Coeff. of Variability	0.1469
Minimum	43,359,033
Maximum	155,139,691
Range Width	111,780,658
Mean Std. Error	69,301

Percentiles:	Forecast values
0%	43,359,033
10%	84,736,571
20%	92,393,879
30%	97,797,507
40%	102,338,292
50%	106,535,764
60%	110,451,946
70%	114,532,885
80%	119,066,259
90%	124,869,443
100%	155,139,691

Tier 3 Group C Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 136,349,716 to 253,336,462
Entire range is from 83,448,890 to 298,531,254
Base case is 201,620,047
After 50,000 trials, the std. error of the mean is 134,358



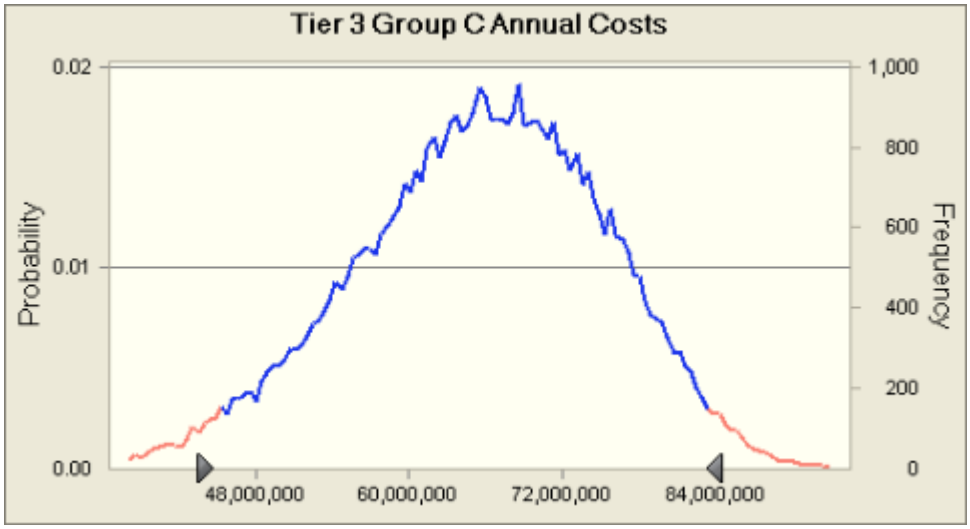
Statistics:	Forecast values
Trials	50,000
Mean	199,146,647
Median	200,646,556
Mode	---
Standard Deviation	30,043,315
Variance	902,600,747,041,343
Skewness	-0.2579
Kurtosis	2.85
Coeff. of Variability	0.1509
Minimum	83,448,890
Maximum	298,531,254
Range Width	215,082,365
Mean Std. Error	134,358

Percentiles:	Forecast values
0%	83,448,890
10%	158,939,410
20%	173,934,415
30%	184,083,778
40%	192,782,884
50%	200,646,556
60%	208,518,512
70%	216,576,593
80%	225,257,558
90%	236,719,121
100%	298,531,254

Tier 3 Group C Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 44,958,715 to 82,905,266
Entire range is from 28,846,335 to 97,582,514
Base case is
69,236,586



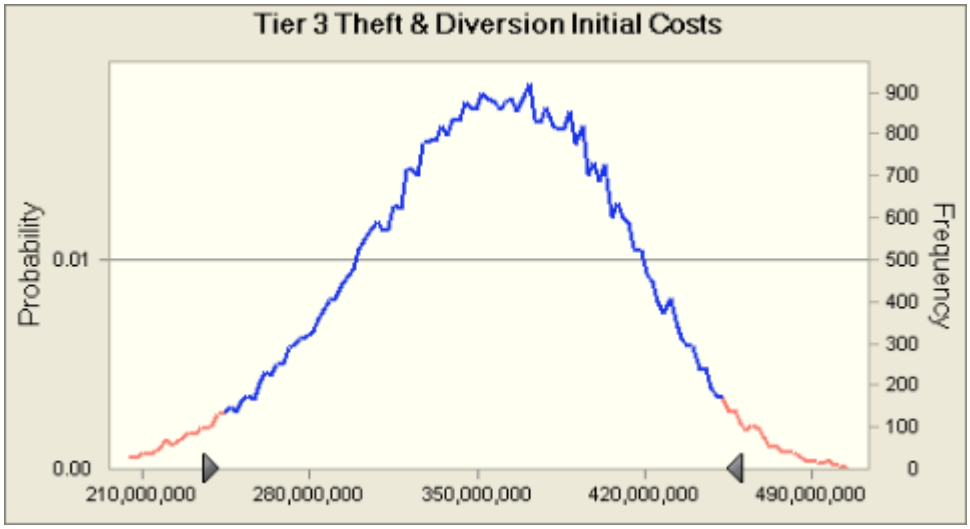
Statistics:	Forecast values
Trials	50,000
Mean	65,445,494
Median	65,957,604
Mode	---
Standard Deviation	9,812,079
Variance	96,276,887,697,138
Skewness	-0.2748
Kurtosis	2.86
Coeff. of Variability	0.1499
Minimum	28,846,335
Maximum	97,582,514
Range Width	68,736,179
Mean Std. Error	43,881

Percentiles:	Forecast values
0%	28,846,335
10%	52,309,562
20%	57,130,275
30%	60,638,439
40%	63,426,269
50%	65,957,604
60%	68,493,046
70%	71,077,953
80%	73,982,397
90%	77,723,286
100%	97,582,514

Tier 3 Theft & Diversion Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 242,540,102 to 452,453,005
Entire range is from 146,967,315 to 542,807,982
Base case is 356,441,618
After 50,000 trials, the std. error of the mean is 241,268



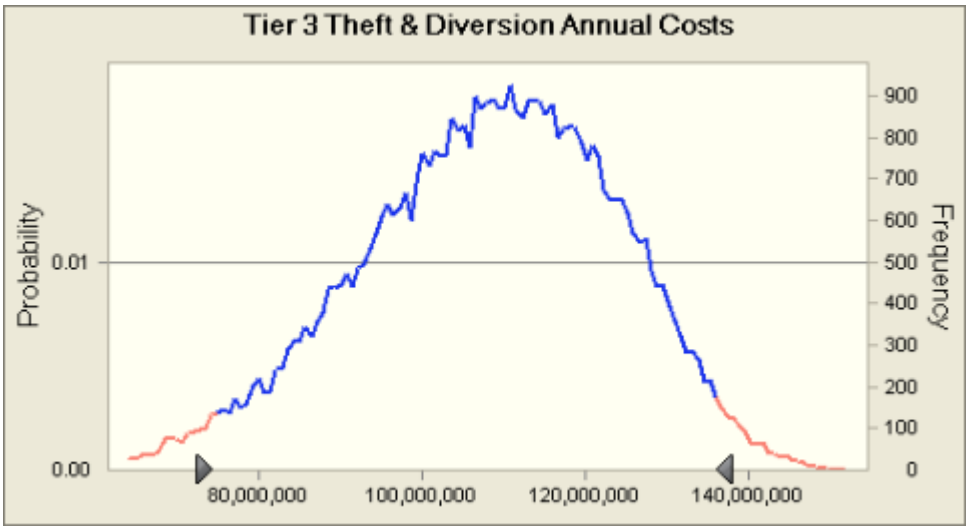
Statistics:	Forecast values
Trials	50,000
Mean	354,600,898
Median	356,861,593
Mode	---
Standard Deviation	53,949,067
Variance	2,910,501,826,831,740
Skewness	-0.2320
Kurtosis	2.86
Coeff. of Variability	0.1521
Minimum	146,967,315
Maximum	542,807,982
Range Width	395,840,667
Mean Std. Error	241,268

Percentiles:	Forecast values
0%	146,967,315
10%	282,887,150
20%	308,854,958
30%	327,651,664
40%	342,860,591
50%	356,861,593
60%	370,984,941
70%	385,541,947
80%	401,339,989
90%	422,336,377
100%	542,807,982

Tier 3 Theft & Diversion Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 74,589,847 to 135,612,722
Entire range is from 46,800,141 to 153,869,505
Base case is 109,168,486



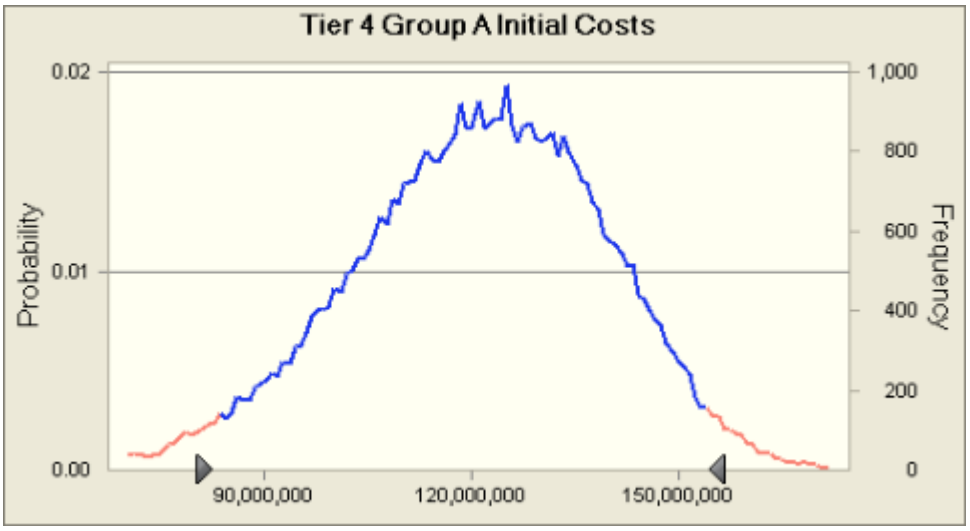
Statistics:	Forecast values
Trials	50,000
Mean	108,008,579
Median	109,039,937
Mode	---
Standard Deviation	15,795,393
Variance	249,494,424,721,908
Skewness	-0.3294
Kurtosis	2.85
Coeff. of Variability	0.1462
Minimum	46,800,141
Maximum	153,869,505
Range Width	107,069,364
Mean Std. Error	70,639

Percentiles:	Forecast values
0%	46,800,141
10%	86,776,067
20%	94,647,251
30%	100,240,420
40%	104,836,496
50%	109,039,937
60%	113,120,721
70%	117,312,959
80%	121,865,972
90%	127,683,684
100%	153,869,505

Tier 4 Group A Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 82,728,026 to 153,898,798
Entire range is from 50,718,998 to 182,923,507
Base case is 120,660,194



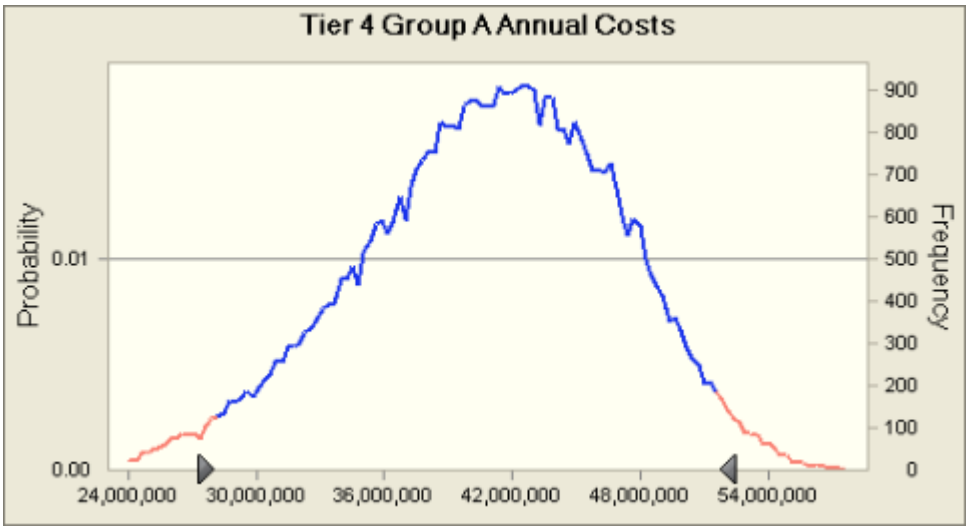
Statistics:	Forecast values
Trials	50,000
Mean	120,922,307
Median	121,808,650
Mode	---
Standard Deviation	18,259,292
Variance	333,401,738,267,099
Skewness	-0.2457
Kurtosis	2.88
Coeff. of Variability	0.1510
Minimum	50,718,998
Maximum	182,923,507
Range Width	132,204,510
Mean Std. Error	81,658

Percentiles:	Forecast values
0%	50,718,998
10%	96,697,911
20%	105,561,413
30%	111,788,227
40%	117,070,200
50%	121,808,650
60%	126,474,320
70%	131,419,143
80%	136,706,989
90%	143,774,099
100%	182,923,507

Tier 4 Group A Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 28,124,116 to 51,520,923
Entire range is from 17,966,763 to 60,130,684
Base case is
40,575,591
After 50,000 trials, the std. error of the mean is 27,001



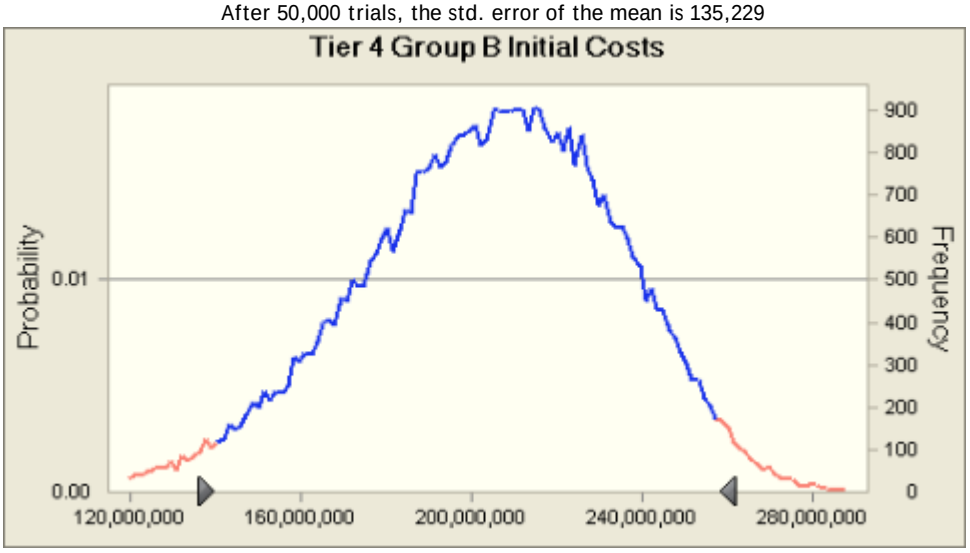
Statistics:	Forecast values
Trials	50,000
Mean	40,819,056
Median	41,194,264
Mode	---
Standard Deviation	6,037,584
Variance	36,452,416,213,579
Skewness	-0.3058
Kurtosis	2.87
Coeff. of Variability	0.1479
Minimum	17,966,763
Maximum	60,130,684
Range Width	42,163,920
Mean Std. Error	27,001

Percentiles:	Forecast values
0%	17,966,763
10%	32,685,338
20%	35,712,595
30%	37,882,303
40%	39,610,995
50%	41,194,264
60%	42,720,381
70%	44,317,418
80%	46,110,449
90%	48,322,408
100%	60,130,684

Tier 4 Group B Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 140,049,218 to 257,289,539
Entire range is from 81,540,393 to 305,881,134
Base case is 200,959,050
After 50,000 trials, the std. error of the mean is 135,229



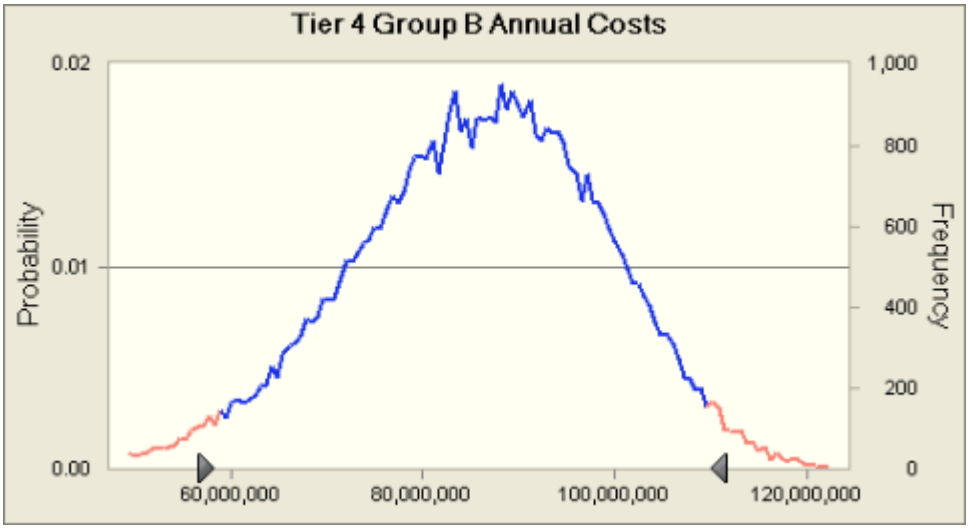
Statistics:	Forecast values
Trials	50,000
Mean	203,632,858
Median	205,501,697
Mode	---
Standard Deviation	30,238,150
Variance	914,345,698,976,117
Skewness	-0.2932
Kurtosis	2.87
Coeff. of Variability	0.1485
Minimum	81,540,393
Maximum	305,881,134
Range Width	224,340,742
Mean Std. Error	135,229

Percentiles:	Forecast values
0%	81,540,393
10%	163,170,085
20%	178,146,487
30%	188,714,338
40%	197,415,680
50%	205,501,697
60%	213,160,067
70%	221,128,396
80%	229,861,886
90%	241,486,305
100%	305,881,134

Tier 4 Group B Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 58,532,450 to 109,533,177
Entire range is from 35,900,769 to 133,952,772
Base case is
84,528,105



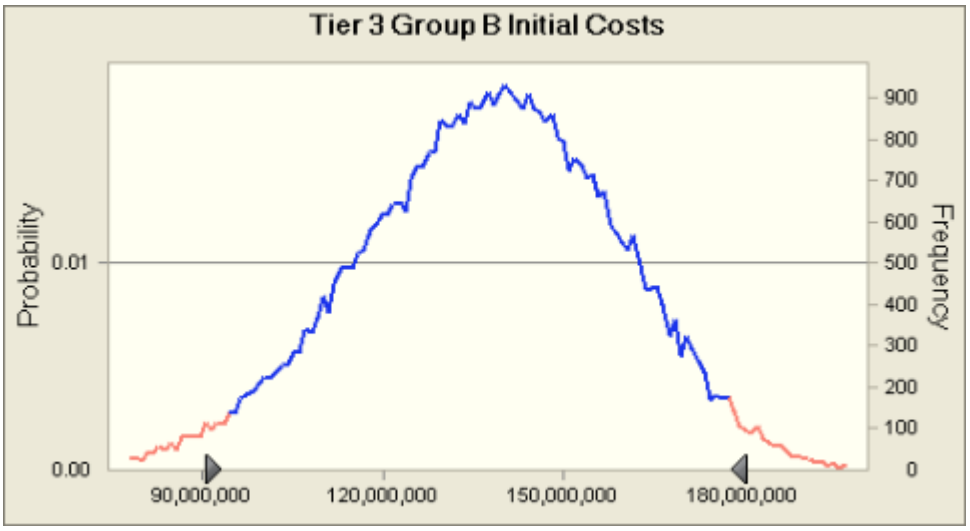
Statistics:	Forecast values
Trials	50,000
Mean	85,740,509
Median	86,404,939
Mode	---
Standard Deviation	13,093,765
Variance	171,446,690,795,508
Skewness	-0.2247
Kurtosis	2.86
Coeff. of Variability	0.1527
Minimum	35,900,769
Maximum	133,952,772
Range Width	98,052,003
Mean Std. Error	58,557

Percentiles:	Forecast values
0%	35,900,769
10%	68,301,975
20%	74,650,671
30%	79,149,823
40%	82,926,612
50%	86,404,939
60%	89,717,617
70%	93,180,704
80%	97,076,600
90%	102,234,583
100%	133,952,772

Tier 4 Group C Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 93,488,986 to 177,158,881
Entire range is from 54,374,433 to 216,082,682
Base case is 134,668,381



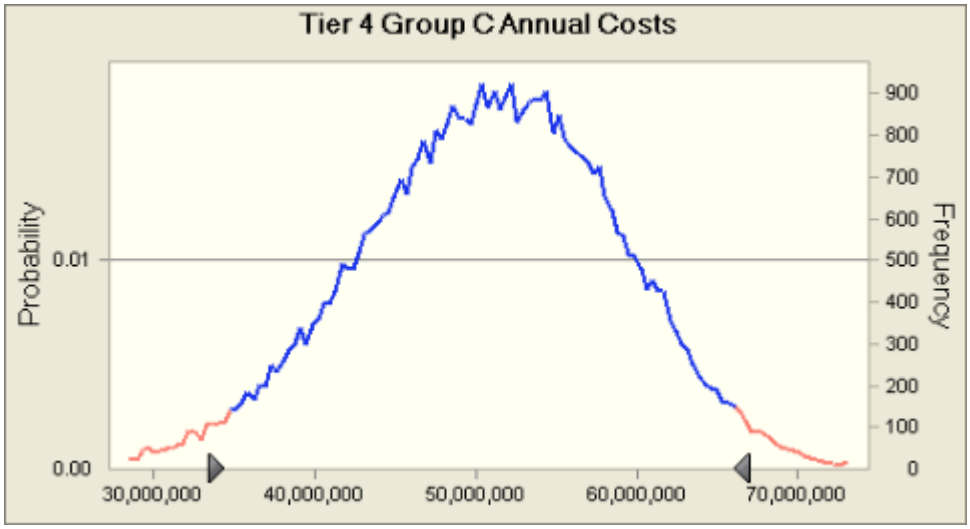
Statistics:	Forecast values
Trials	50,000
Mean	137,404,705
Median	138,197,124
Mode	---
Standard Deviation	21,452,410
Variance	460,205,887,094,594
Skewness	-0.1711
Kurtosis	2.88
Coeff. of Variability	0.1561
Minimum	54,374,433
Maximum	216,082,682
Range Width	161,708,250
Mean Std. Error	95,938

Percentiles:	Forecast values
0%	54,374,433
10%	109,206,814
20%	119,183,833
30%	126,620,698
40%	132,619,751
50%	138,197,124
60%	143,594,155
70%	149,222,307
80%	155,834,009
90%	164,637,318
100%	216,082,682

Tier 4 Group C Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 34,487,726 to 65,768,028
Entire range is from 20,276,641 to 81,970,396
Base case is
49,846,627
After 50,000 trials, the std. error of the mean is 35,777



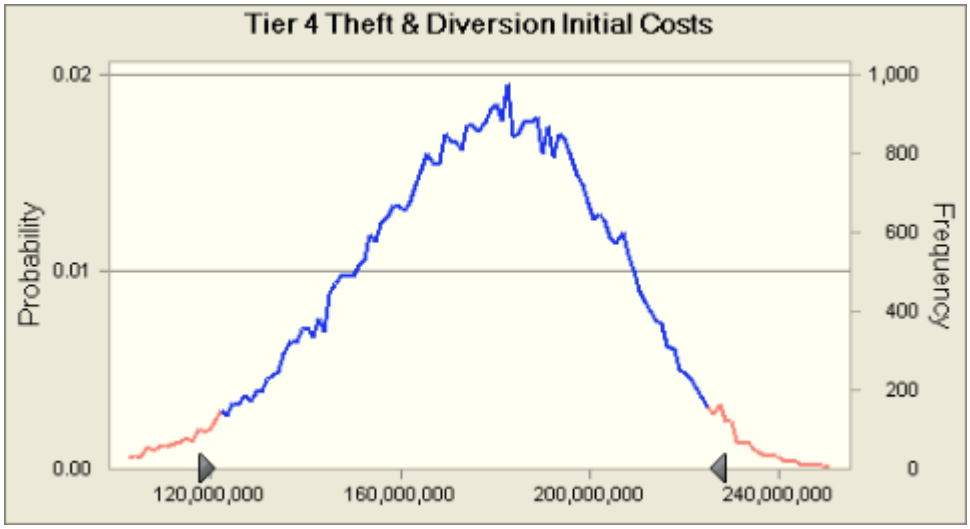
Statistics:	Forecast values
Trials	50,000
Mean	50,768,691
Median	51,053,580
Mode	---
Standard Deviation	8,000,012
Variance	64,000,192,384,467
Skewness	-0.1540
Kurtosis	2.89
Coeff. of Variability	0.1576
Minimum	20,276,641
Maximum	81,970,396
Range Width	61,693,755
Mean Std. Error	35,777

Percentiles:	Forecast values
0%	20,276,641
10%	40,247,306
20%	43,988,732
30%	46,685,313
40%	48,944,932
50%	51,053,580
60%	53,107,267
70%	55,205,015
80%	57,600,372
90%	60,896,569
100%	81,970,396

Tier 4 Theft & Diversion Initial Costs

Summary:

Certainty level is 95.000%
Certainty range is from 121,446,703 to 224,273,686
Entire range is from 65,647,801 to 269,534,557
Base case is 172,211,375
After 50,000 trials, the std. error of the mean is 118,634



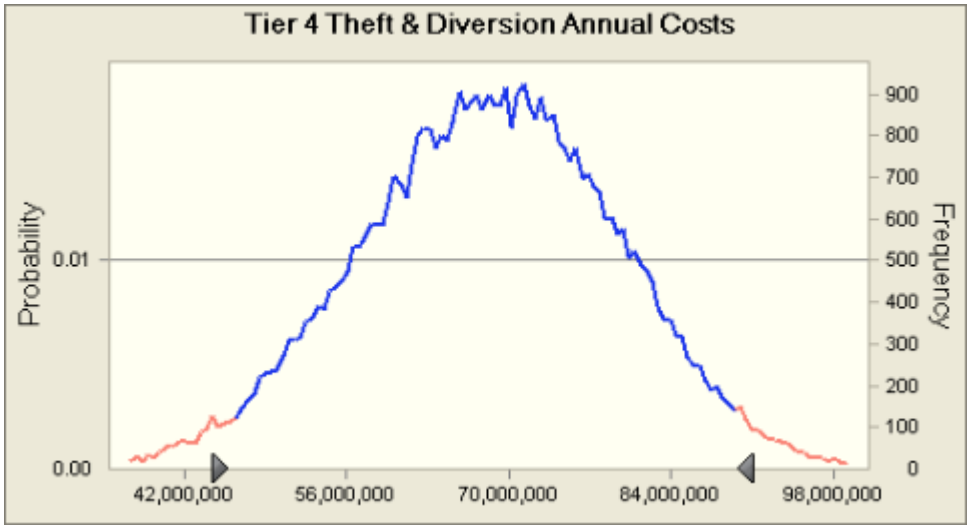
Statistics:	Forecast values
Trials	50,000
Mean	176,626,434
Median	178,160,196
Mode	---
Standard Deviation	26,527,278
Variance	703,696,503,089,606
Skewness	-0.2610
Kurtosis	2.86
Coeff. of Variability	0.1502
Minimum	65,647,801
Maximum	269,534,557
Range Width	203,886,756
Mean Std. Error	118,634

Percentiles:	Forecast values
0%	65,647,801
10%	141,040,744
20%	154,138,594
30%	163,446,196
40%	171,039,462
50%	178,160,196
60%	184,843,113
70%	191,850,259
80%	199,599,963
90%	209,775,101
100%	269,534,557

Tier 4 Theft & Diversion Annual Costs

Summary:

Certainty level is 95.000%
Certainty range is from 45,975,055 to 89,386,427
Entire range is from 27,900,571 to 111,098,589
Base case is
66,611,840
After 50,000 trials, the std. error of the mean is 49,726



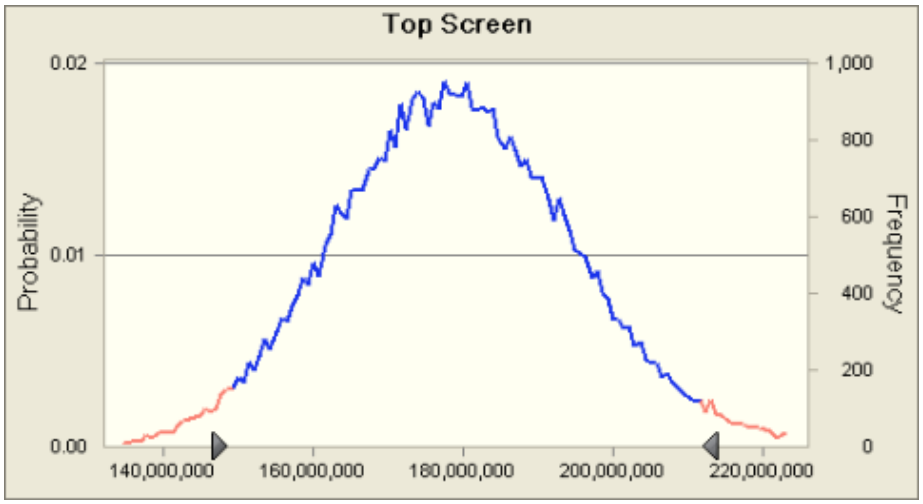
Statistics:	Forecast values
Trials	50,000
Mean	68,203,916
Median	68,428,440
Mode	---
Standard Deviation	11,119,034
Variance	123,632,913,740,385
Skewness	-0.0855
Kurtosis	2.87
Coeff. of Variability	0.1630
Minimum	27,900,571
Maximum	111,098,589
Range Width	83,198,018
Mean Std. Error	49,726

Percentiles:	Forecast values
0%	27,900,571
10%	53,596,300
20%	58,735,623
30%	62,425,981
40%	65,562,654
50%	68,428,440
60%	71,290,803
70%	74,238,873
80%	77,717,046
90%	82,317,380
100%	111,098,589

Top-Screen

Summary:

Certainty level is 95.000%
Certainty range is from 148,710,553 to 211,451,998
Entire range is from 119,318,440 to 266,029,920
Base case is 178,756,900



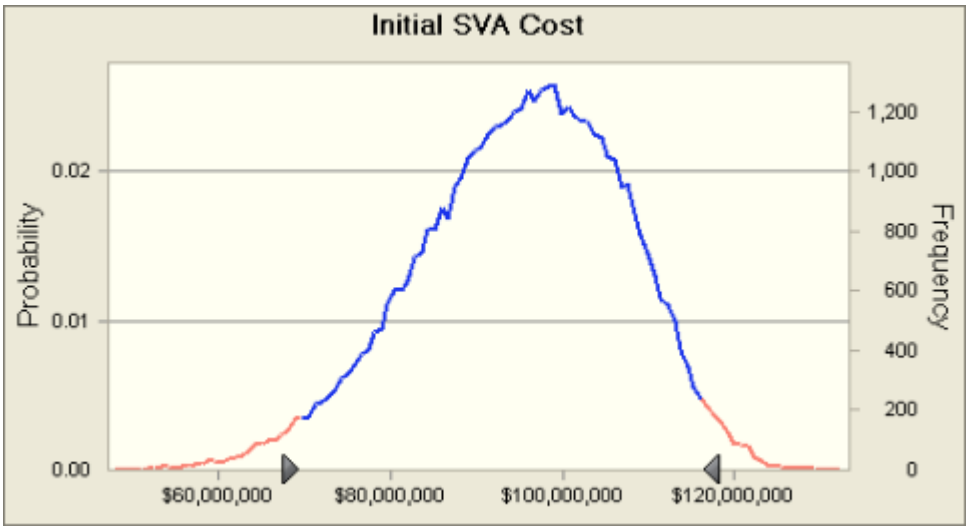
Statistics:	Forecast values
Trials	50,000
Mean	178,923,512
Median	178,600,344
Mode	---
Standard Deviation	15,957,027
Variance	254,626,702,281,228
Skewness	0.1355
Kurtosis	3.10
Coeff. of Variability	0.0892
Minimum	119,318,440
Maximum	266,029,920
Range Width	146,711,480
Mean Std. Error	71,362

Percentiles:	Forecast values
0%	119,318,440
10%	158,713,480
20%	165,398,432
30%	170,387,546
40%	174,559,576
50%	178,600,344
60%	182,608,378
70%	186,965,183
80%	192,223,111
90%	199,379,704
100%	266,029,920

Initial SVA Cost

Summary:

Certainty level is 95.000%
Certainty range is from $69,513,920 to $115,899,040
Entire range is from $47,467,380 to $132,784,760
Base case is $87,347,510



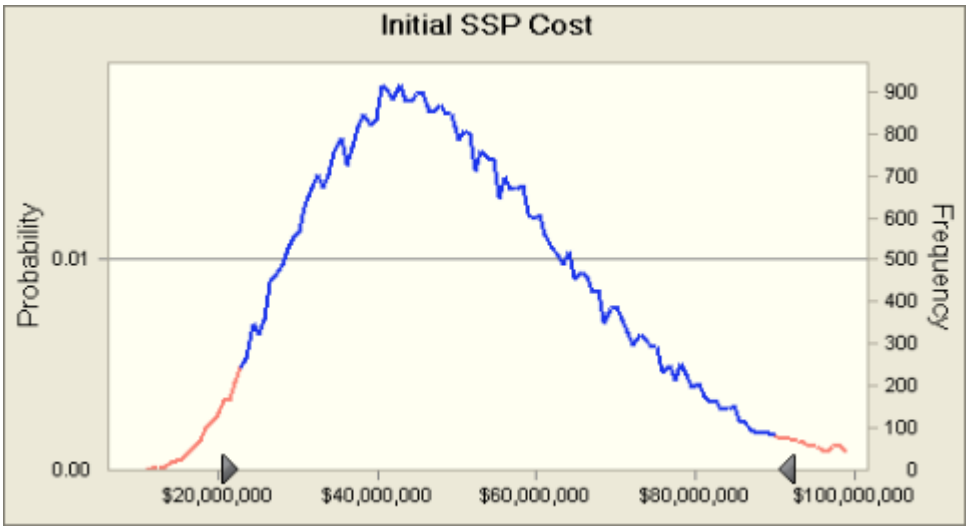
Statistics:	Forecast values
Trials	50,000
Mean	$95,005,813
Median	$95,833,920
Mode	$63,798,690
Standard Deviation	$12,005,736
Variance	$144,137,708,870,901
Skewness	-0.3424
Kurtosis	2.89
Coeff. of Variability	0.1264
Minimum	$47,467,380
Maximum	$132,784,760
Range Width	$85,317,380
Mean Std. Error	$53,691

Percentiles:	Forecast values
0%	$47,467,380
10%	$78,960,540
20%	$84,850,410
30%	$89,077,010
40%	$92,584,300
50%	$95,833,920
60%	$98,896,530
70%	$102,108,550
80%	$105,571,960
90%	$109,873,570
100%	$132,784,760

Initial SSP Cost

Summary:

Certainty level is 95.000%
Certainty range is from $22,882,179 to $89,797,236
Entire range is from $8,529,885 to $164,325,831
Base case is $35,436,875
After 50,000 trials, the std. error of the mean is $77,864



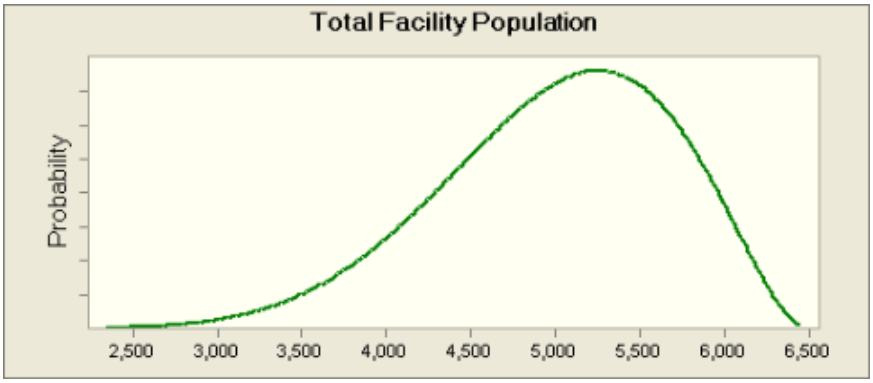
Statistics:	Forecast values
Trials	50,000
Mean	$50,329,860
Median	$48,105,955
Mode	---
Standard Deviation	$17,410,827
Variance	$303,136,882,193,346
Skewness	0.6902
Kurtosis	3.53
Coeff. of Variability	0.3459
Minimum	$8,529,885
Maximum	$164,325,831
Range Width	$155,795,946
Mean Std. Error	$77,864

Percentiles:	Forecast values
0%	$8,529,885
10%	$29,667,435
20%	$35,147,987
30%	$39,774,262
40%	$43,890,888
50%	$48,105,955
60%	$52,678,877
70%	$57,920,227
80%	$64,425,724
90%	$73,998,891
100%	$164,325,831

Assumption: Total Facility Population

Beta distribution with parameters:

Minimum	1,500
Maximum	6,500
Alpha	7
Beta	3



Statistics:

	Distribution
Trials	---
Mean	5,000
Median	5,069
Mode	5,250
Standard Deviation	691
Variance	477,273
Skewness	-0.4825
Kurtosis	2.86
Coeff. of Variability	0.1382
Minimum	1,500
Maximum	6,500
Range Width	5,000
Mean Std. Error	---

Percentiles:

	Distribution
0%	1,500
5%	3,752
10%	4,050
15%	4,252
20%	4,412
25%	4,547
30%	4,667
35%	4,777
40%	4,879
45%	4,976
50%	5,069
55%	5,159
60%	5,249
65%	5,338
70%	5,429
75%	5,522
80%	5,621
85%	5,729
90%	5,853
95%	6,011
100%	6,500