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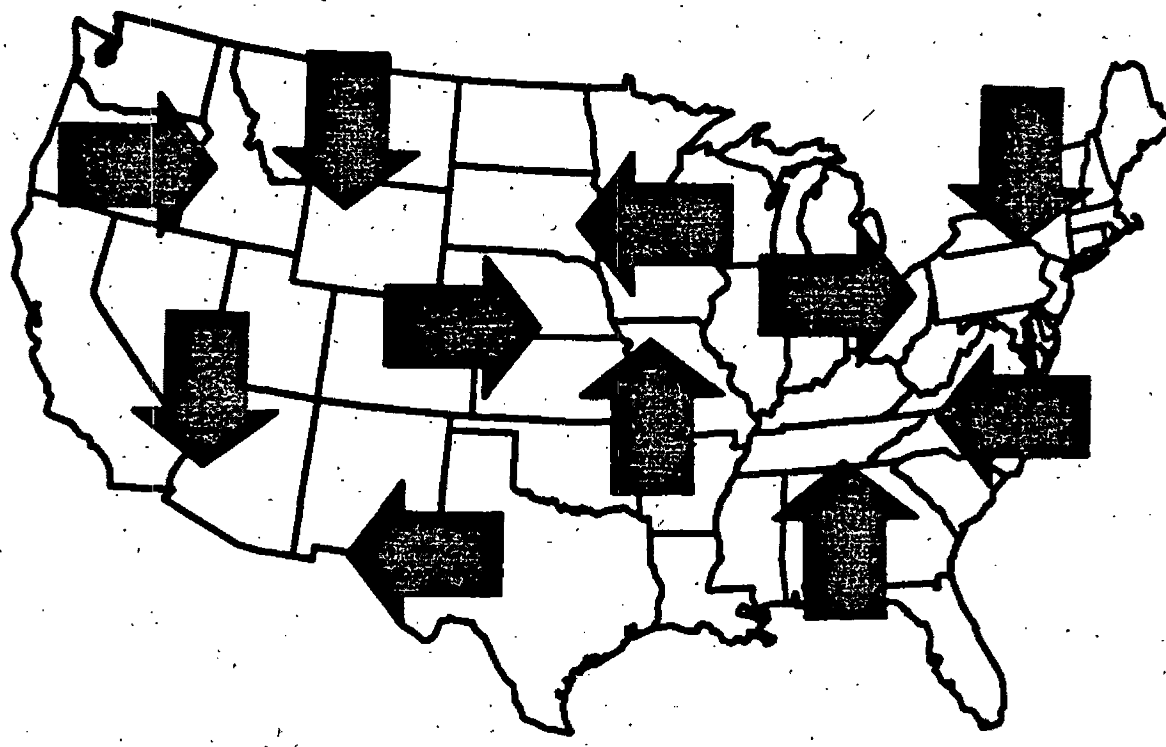
One-time Waste Estimates for Capacity Assurance Planning

Capacity Planning Pursuant to CERCLA Section 104(c)(9)



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BACKGROUND AND SUMMARY

Section 104(c)(9) of CERCLA requires states to assure adequate capacity for the treatment and disposal of hazardous wastes that are reasonably expected to be generated within a state for 20 years before any remedial action is provided by EPA under section 104. This assurance, the basis of which is in the form of Capacity Assurance Plans (CAPs), must be provided in a contract or cooperative agreement entered into between the state and the Administrator. If such an assurance is not provided, no Superfund financed remedial actions can be provided.

States must provide an assurance that addresses any hazardous waste (i.e., recurrent and remedial) reasonably expected to be generated within the state. The 1993 *Guidance for Capacity Assurance Planning* addresses the issue of how states should make the capacity assurance for recurrent wastes. This particular report is part of the Agency effort to assist states in assuring capacity for one-time wastes. The Agency began working on this effort over two years ago in response to states' concerns over the difficulties they faced when developing one-time waste projections for their 1989 CAPs. Specifically, the National Governors' Association's (NGA) CAP Policy Development Workgroup made a recommendation to form a workgroup of state and EPA representatives to develop approaches to calculate future one-time waste generation. The proposals developed by this workgroup provided the basis for an effort EPA subsequently undertook with a research group at Oak Ridge National Laboratories/University of Tennessee. The methodologies developed from this collaborative effort were revised after consultation with the appropriate EPA program offices, a presentation to the NGA CAP Policy Development Workgroup, and comments received from the states.

This report contains detailed descriptions of the methodologies the Agency used to develop tonnage estimates representing twenty years of off-site shipments to commercial Subtitle C hazardous waste management facilities. The Agency used the one-time waste estimates which appear in Appendix A when it conducted the national assessment of all states' CAP data. This report discusses the methods for calculating wastes associated with the five major sources of remediation activities: Superfund remedial actions; Superfund removal actions; RCRA Corrective Actions; Underground Storage Tanks cleanups; and State and Private cleanups. The Agency will make publicly available in the fall of 1994 another report which describes how states can reduce the generation of these wastes through the promotion of on-site treatment using conventional and innovative technologies.

The five methodologies identify for each source of remediation: (1) the potential sources of contamination (e.g., the number of tanks containing hazardous waste, the NPL sites that have the potential to send waste off-site); (2) the type of contamination (e.g., organics, metals) to determine the appropriate treatment; (3) the probability that the waste generated at these sites will be sent off-site for treatment and disposal; (4) the waste tonnages that will likely be sent off-site; (5) the tonnage of treatment residuals generated from treatment of these wastes; (6) the probability of disposal of the waste and residuals in Subtitle C versus Subtitle D landfills; and (7) the distribution of waste tonnages twenty year period.

All of the methodologies presented in this report contain cross-cutting assumptions that apply nationwide and are derived from both the analysis of historical data on cleanups and the interpretation of the impacts of current Agency policies on one-time waste cleanups. The supporting documentation for the assumptions can be found in RCRA Docket F-92-CAGA-FFFFF. The primary assumptions include the following:

- Since wastewater contamination at clean-up sites is typically treated on-site using pump and treat technologies, all the methodologies in this report assume that wastewaters at remedial sites will be treated on-site and that residuals from such treatment are negligible.

- Because data indicate that the majority of remediation wastes shipped off-site to Subtitle C managements are sent to incinerators, landfills, and/or facilities that stabilize wastes, these were the only managements considered in the methodologies. Moreover, since hazardous remediation wastes contaminated with organic constituents and shipped off-site to commercial Subtitle C facilities typically are treated by incineration and those contaminated with metals are typically stabilized, the methods assume organic wastes are incinerated and metal wastes are stabilized.

- Since the 1993 CAP *Guidance* addresses incinerator ash and stabilized residuals shipped to Subtitle C landfills, the one-time waste methodologies also considers these residuals. However, because residuals generated by treatment of contaminated media generally have a higher inorganic content than residuals from recurrent waste, different residual factor were established for one-time residuals. Residual ash amounts for wastes treated with incineration were calculated by using a factor of 1.0 (i.e., soil into an incinerator equals soil out of an incinerator) and 1.5 for waste destined for stabilization (i.e., fifty percent increase in amounts disposed of in landfills after stabilization).

- For the purposes of the Agency's assessment of capacity, States were asked to account for waste demands from 1991 to 2013. States are responsible for submitting Biennial Reporting System (BRS) data or its equivalent to determine remediation quantities for 1991 (i.e., data submitted in CAP Table 3 for one-time wastes). EPA has developed waste tonnages for each year from 1992 to 1999. From 1999 to 2013, EPA will assign the average tonnage for the seven year period from 1992 to 1999.

- EPA excluded from the methodologies remediation wastes generated by federal facilities. EPA investigated primarily Department of Defense (DOD) and Department of Energy (DOE) facilities since they have the majority of the federal facilities sites that need remediation. An EPA analysis of clean-ups at DOD facilities sites showed that most management of remedial waste occurred on-site. EPA expects this practice to continue because of DOD policies which promote on-site treatment, and the reality that many cleanup wastes at DOD facilities are dangerous to transported and require specialized management (e.g., wastes with explosive contaminants). Because many DOE remediation sites are contaminated with mixed hazardous/radioactive wastes and these wastes have been excluded from the CAP pursuant to the 1993 *Guidance* due to transportation and human handling/exposure concerns, DOE facilities were not considered in the methodologies.

These general assumptions, as well as the specific assumptions developed for each methodology, are based on nationally-available data. EPA recognizes that states may have more accurate, state-specific data for each methodology described in this report. Many states did send in data or comments on these methodologies, which the Agency incorporated into this final document.

1. SUPERFUND REMEDIAL ACTIONS

1.1 INTRODUCTION

This chapter presents the methodology used to estimate the total amount of one-time hazardous wastes generated by Superfund remedial actions for the years 1992 to 2013 on a state-by-state basis. Superfund remedial actions are the actual construction and implementation of a Superfund remedial design that results in long-term site cleanup. The Superfund program identifies sites where hazardous substances have been, or might be, released into the environment; ensures that these substances are cleaned up by responsible parties or the government; and evaluates damages to natural resources.

The methodology that the Agency has developed uses data on existing National Priority List (NPL) sites to estimate waste generation each year through 1999. EPA assumes an average annual rate of waste generation from 2000 to 2013 based on the average annual waste volume in each State from 1992 to 1999. Only those hazardous wastes requiring RCRA Subtitle C off-site commercial treatment or disposal capacity are included in this study. This methodology does not take into account potential changes to the Superfund program resulting from Superfund Reauthorization.

1.2 DATA SOURCES

EPA utilized numerous data sources to [illegible] site-specific information on all NPL sites expected to generate one-time waste managed off site from 1992 to 1999 (EPA 1993a).

1.2.1 SUPERFUND RODs

EPA prepares RODs for each NPL site prior to the remedial action. RODs describe the site contamination and planned remedial activities. Specific data from RODs used in this methodology include site location, waste volume, waste type, location of planned remedies (i.e., on-site or off-site), and contaminant types. The databases used for this project are described below.

HAZDATA and BASECOST

These databases contain information drawn from 231 RODs signed between 1987 and early 1990 that were compiled by researchers at the University of Tennessee for a previous study (English, 1991). HAZDATA contains the following data elements: site name and location; site industry; date of signing of the ROD; site hydrogeological and geological information; contamination sources and volumes; remediation approaches recommended in RODs; types of contaminants, their concentrations, and cleanup goals; and the projected cost of the remediation effort.

Exhibit 1-1
Data Sources for the Superfund Remedial Action Methodology

Database/ Report	Data Element	Data Years Used	Who Collected	Data Sources
HAZDATA	site name site location site type ROD date site characteristics contaminant sources contaminant types volume remediation technology	1987 to early, 1990	ORNL/UTK	EPA RODs, NPL Technical Data Files, and EPA contacts
BASECOST	site name volume remediation technology duration	1987 to early 1990	ORNL/UTK	same as HAZDATA (companion database)
SUMROD	site name site location ROD date media type contaminant types	1983 to early 1990	Ontario Ministry of the Environment	EPA RODs
NPL Technical Data Files	site name site location site activity media type contaminant types remediation technology date in NPL	as of February 1990	EPA	--
CRES (schedule of NPL site events)	site name site location event type estimated start year estimated end year actual start year actual end year	1982 to early 1992	Pasha Publications	EPA RODs and EPA SCAP11 report
Guide to Superfund Sites	site name site size volume contaminant type site type	1982 to early 1992	R. C. DiGregorio/ Pasha Publications	EPA RODs + EPA reports and contacts
EPA ROD Annual Reports	site name site size volume contaminant type site type remediation technology	1982 to 1991	EPA	EPA RODs

Exhibit 1-1 (continued)
Data Sources for the CERCLA Remedial Action Methodology

Database/ Report	Data Element	Data Years Used	Who Collected	Data Sources
HWIR RODs Database	site name site location ROD date volume contaminant types remedy location	1992 to 1993	ICF Incorporated	EPA RODs
TIO report (EPA, 1993b)	name, location, contaminant type, and media type for sites without RODs; summary statistics on past RODs	1982 to 1991 and projections to 1996	EPA, Technology Innovation Office	EPA RODs

BASECOST contains waste volume information for individual remediation technologies associated with the sites or operable units reported in the HAZDATA database. A total of 548 records comprise the BASECOST database. It also includes estimates for the duration of the cleanup under the recommended remediation technology.

SUMROD

This database contains data extracted from RODs signed between 1983 and early 1990. The database was compiled by the Ontario Ministry of the Environment to assist them in developing soil cleanup criteria. The database is organized on a compound-by-compound basis, and includes site name and location, date the ROD was signed, media type, cleanup goal, and the site contaminants.

U.S. EPA ROD Annual Reports for FY 1990 and 1991

RODs and ROD Amendments for all Superfund sites signed within an EPA fiscal year are documented in annual reports published by EPA. The annual reports for fiscal years 1990 and 1991 were used extensively for this project. Each abstract for RODs signed in 1990 and 1991 was reviewed, and those containing the keywords "Off-site Treatment" or "Off-site Disposal" were selected as sites with potential for generation of off-site wastes. Summary tables provided in these annual reports also include overviews of site problems, selected remedies, clean-up criteria, and estimated costs for all RODs signed between 1982 and 1989. For RODs signed during 1982-1989, the keyword search was applied to the summary tables to identify those that recommended off-site treatment or disposal as their remedial technologies. RODs signed prior to 1986 were checked against the current NPL, and sites that had completed their cleanup efforts prior to 1992 or had been deleted from the NPL were removed from the final data set.

Hazardous Waste Identification Rule RODs Database

This database was compiled by EPA's Office of Solid Waste in support of economic analysis for future rulemakings regarding the Hazardous Waste Identification Rule (HWIR). The database includes data on contaminated soil, sediment, debris, and waste (e.g., sludge) mixed with soil and/or sediment from RODs signed in 1989 through 1992 and from some 1993 RODs. The database is organized by site and includes data on waste volumes, contaminants, contaminant concentrations, and in-situ versus ex-situ management. Data for RODs signed in 1992 and 1993 were used by EPA for the CAP one-time waste projections.

EPA pooled data from HAZDATA, BASECOST, SUMROD, the EPA ROD annual reports, and the HWIR RODs database to form a single database for all RODs at NPL sites expected to generate one-time wastes during the projection period of 1992-1999. However, these data are not sufficient themselves for projecting future generation because RODs do not always contain waste volumes, waste management methods, or whether the waste will be managed on site or off site. Additionally, EPA has not completed RODs for all sites currently on the NPL. Therefore, EPA supplemented RODs data with information from other sources described below.

1.2.2 NPL Technical Data Files

This database contains information for approximately 1,200 sites on the NPL as of February 1990. The four major categories of data are Hazard Ranking System (HRS) scoring data, site documentation data, administrative data, and auxiliary data. Data elements include site name and location, site activities, contaminated media type (e.g., soil, sediments, ground water), types of contaminants, contamination impact, remediation technology, site ownership, and the date that the site was added to the NPL. The database was used by English (1991) to help create the HAZDATA and BASECOST databases.

1.2.3 1992-1993 Guide to Superfund Sites

This report, compiled and edited by R. C. DiGregorio of Pasha Publications Incorporated (DiGregorio, 1992), contains status reports for over 1,200 sites listed in the NPL as of the end of 1991. It provides site history and technical information such as the recommended remedial technologies. EPA used this publication in conjunction with the EPA ROD Annual Reports to obtain supplemental information on site size, waste types, and waste volumes. In the event that discrepancies among the sources were found, EPA relied on information reported in the EPA ROD Annual Reports.

1.2.4 CERCLIS Remedial Event Schedule (CRES) Database

This database was prepared by Pasha Publications, Incorporated and includes 3,152 records, each representing an event scheduled for the Superfund sites as of early 1992. The CRES database provided data on the actual or planned year of cleanups and was used to calculate the average duration of the steps in the remedial action process for sites whose schedules were not provided in the RODs.

1.2.5 EPA Technology Innovation Office Report; *Cleaning Up the Nations Waste Sites: Markets and Technology Trends (TIO Report)* (EPA 1993c)

The TIO report provides data for individual NPL sites without RODs as of September 30, 1991. EPA used these data, including site name, location, media contaminated, contaminant types, and planned ROD date, to estimate waste volumes for sites without RODs. EPA also used data from the TIO report to estimate waste volumes for sites with RODs that did not contain volume data, and to estimate the proportions of remedial action waste managed in different CAP Management Categories.

1.3 METHODOLOGY

EPA used site-specific data to estimate State-by-State and year-by-year waste volumes from 1992 to 1999. It then assumed a constant annual waste generation in each State from 2000 to 2013 based on an average of the volumes from the proceeding years. This approach is consistent with the projection methodology for recurrent wastes.

1.3.1 Identify Sites with Potential Off-site Waste Generation

EPA compiled data for all NPL sites that will potentially generate one-time wastes that will be managed off site between the beginning of 1992 and the end of 1999. Two types of sites were included: sites with RODs and sites without RODs. EPA excluded sites with RODs where the selected remedy will include on-site waste management only, and sites with ground water contamination only. In addition, as stated in the Introduction, EPA excluded federal facilities from this methodology.

Sites without RODs were identified in the TIO report (EPA 1993c). Appendix A of the TIO report lists all sites on the NPL without RODs, as of September 30 1991. EPA used media contamination data in the TIO report to identify sites expected to generate off-site wastes. In particular, EPA assumed that sites identified in the TIO report which have only ground water contamination will not generate off-site wastes, and sites with contaminated soil or sediment or other hazardous wastes will have the potential to generate off-site wastes.

Because site data were compiled from several existing sources, EPA compared all data sources to ensure that ROD data for a single site were not included twice. Sites may appear in the data set more than once, however, if separate RODs were issued for different parts of the site.

1.3.2 Estimate Volume of Waste to be Generated at Each Site

The total quantities of hazardous waste expected to be generated from Superfund remedial actions are generally estimated during the Remedial Investigation/Feasibility Studies (RI/FSs), and documented in the RODs. In the event that the total volume of hazardous wastes generated from a site was not specified in the ROD, EPA reviewed supplemental data sources (e.g., 1992-1993 Guide to Superfund Sites) for volume data. If no volume data were found in any of the available sources, EPA estimated volumes based on the type of contamination at the site. The average volumes per site for each contaminant type were calculated from volume data in RODs signed from 1982 to 1991. Data for this approach were available in Appendix A of the TIO report, and Exhibit 1-2 summarizes these data. The average waste volumes presented in this exhibit were calculated using all RODs with waste volume data from 1982 to 1991, except statistical outliers. These data include volumes that were managed on site or in situ.

For sites with no contaminant data, the average volume assigned was the average volume for all contaminant types, reflecting their frequency of occurrence. This approach was also used for all NPL sites without RODs.

EXHIBIT 1-2
Soil, Sediment, and Sludge Based on Contaminant Types

Contaminant Type	Average Volume Per Site (tons)
Metals	75,400
Volatile Organic Compounds (VOCs)	13,700
Semi-volatile Organic Compounds (SVOCs)	27,600
VOCs and Metals	67,000
SVOCs and Metals	49,200
VOCs and SVOCs	23,500
VOCs, SVOCs, and Metals	102,400
Others	55,300

Source: Exhibit A-5 in, EPA 1993c, p. 121.

1.3.3 Calculate Year-by-year Waste Generation for Each State

The timing of waste generation was based on actual remedial action schedules if available (e.g., from the CRES database). If the actual or previously estimated dates of remediation were not available, EPA estimated the years of waste generation using average event durations calculated from actual remedial action schedules in the CRES database. The estimated average durations of the remediation activities are as follows:

- Five years after a site is listed on the NPL its ROD is signed;
- Three years after a ROD is signed the remedial action begins; and
- Remedial action lasts for two years.

Based on these results, EPA identified the years in which each site with an incomplete schedule is expected to generate waste. For example, sites added to the NPL in 1987 that lack a cleanup schedule are expected to generate waste in 1996 and 1997 because the average duration period from the NPL date to the ROD date is 5 years (i.e., 1992), the average duration of the remedial design period between the ROD signed date and the beginning of the remedial action is 3 years (i.e., completed in 1995) and the average RA lasts 2 years (i.e., 1996 and 1997).

For calculating annual waste volumes, EPA assumed that waste is generated at a constant rate over the two-year remedial action, based on CRES data, as described above. Therefore, 50 percent of the total waste volumes would be generated in each year of the remedial action.

State-by-State waste volume estimates for each year were made by adding waste volumes for all sites on a State-specific basis. The locations of all sites are known from the RODs and other sources identified in Section 1.3.1.

1.3.4 Determine the Proportion of Waste Managed Off Site

For each site identified in Step 1 (Section 1.3.1), EPA estimated the proportion and volume of the waste that is managed in off-site RCRA hazardous waste treatment and disposal facilities. For sites with RODs, EPA used remedial descriptions in the RODs to determine management location.

For sites without RODs and sites whose ROD provided no information on waste management location, EPA estimated the proportion managed off site based on an analysis of 1992 and 1993 RODs. This analysis, which was conducted in support of economic analysis for the forthcoming Hazardous Waste Identification Rule (HWIR), determined that approximately four percent of the soil and sediment (by volume) excavated at Superfund NPL sites with RODs signed in 1992 and 1993 will be managed off site (ICF Incorporated 1993b). EPA based this proportion on RODs signed in 1992 and 1993, rather than on a larger set of RODs (e.g., 1982 to 1993), because RODs signed in recent years provide better information on current remedial action technologies.

EPA's methodology also includes an adjustment to account for the use of Corrective Action Management Units (CAMUs) at Superfund remedial action sites. CAMUs create strong incentives for on-site waste management and may significantly reduce the demand for off-site Subtitle C management from Superfund remedial actions. A more detailed description of CAMUs is presented in Section 3.2.

Although the CAMU concept was developed under the corrective action program, it will affect volumes of waste from Superfund remediations as well. The initial CAMU concept in the proposed Subpart S rule was based in part on the existing Superfund area of contamination (AOCs) concept (the proposed rule was issued June 1990, 55 *Federal Register* 30798). The CAMU, as finalized February 16, 1993 (58 *Federal Register* 8658), is broader than the AOC concept because it allows consolidation of AOCs themselves into a single area for the purpose of remediation at Superfund sites without triggering RCRA land disposal restrictions (LDRs). CAMUs may be used at Superfund sites, because the CAMU rule is an applicable or relevant and appropriate requirement (ARAR) for Superfund decisions. To adjust the estimated Superfund one-time waste volumes for CAMUs, EPA multiplied off-site waste volume estimates by a factor of 0.43, which was derived from background data for the CAMU rule RIA (EPA 1993d).

1.3.5 Allocate Off-site Waste to CAP Management Categories

EPA allocated waste to CAP Management Categories based on contaminant data contained in the RODs. Contaminant types at sites were classified as containing metals only, organics only, or both. For sites without available contaminant data from the RODs, EPA estimated the proportion of wastes in CAP Management Categories based on the number of Superfund sites contaminated with metals, organics, or both from the TIO report:

- 27 percent contaminated with organic constituents only;
- 11 percent contaminated with metals only; and
- 62 percent contaminated with both.

EPA multiplied the waste volume at each site without contaminant data by these percentages to calculate waste quantities in each contaminant class.

To use these contaminant classifications to allocate wastes to CAP Management Categories, EPA assumed that:

- Wastes contaminated with organic constituents are treated by Incineration - Sludge/Solids;
- Wastes contaminated with metals are treated by Stabilization/Chemical Fixation; and
- Wastes contaminated with both contaminant types are treated by in both categories.

To calculate the volume of waste residuals from incineration and stabilization disposed in landfills, EPA assumed that all residuals from the treatment of listed hazardous wastes are managed in RCRA Subtitle C landfills unless the Agency received information otherwise from the states. This assumption is based on the derived-from rule (40 CFR 261.3(c)(2)(i), which requires RCRA Subtitle C management of any solid wastes generated from the treatment, storage or disposal of a listed hazardous wastes unless and until the waste is delisted. EPA also assumed that residuals of treated characteristic wastes do not exhibit a characteristic of hazardous waste, and are managed in RCRA Subtitle D landfills. EPA used 1991 BRS data for Superfund remedial action wastes (BRS Form GM, Source Code A61) to calculate proportions of remedial action wastes are that are listed hazardous wastes or mixtures of listed and characteristic hazardous wastes (ICF Incorporated 1993a):

- 67 percent of one-time wastes contaminated with only organics were listed;
- 10 percent of one-time wastes contaminated with only metals were listed; and
- 96 percent of one-time wastes contaminated with both were listed.

The treatment residuals for these wastes are assumed to be managed in RCRA Subtitle C landfills. A residuals factor of 1.5 is multiplied by the waste volume stabilized to account for the overall increase in volume resulting from the remedy. Incineration is assumed not to change waste volumes (i.e., residuals factor of 1) because Superfund wastes are primarily soils which are not significantly reduced in volume by incineration. These residuals factors are based on volume changes for treated soils reported in the literature (Peretz, 1992).

1.4 REFERENCES

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EPA 1993b. *Guidance for Capacity Assurance Planning*, OSWER Directive Number 9010.02, May.

EPA 1993c. *Cleaning Up the Nation's Waste Sites: Markets and Technology Trends*, Office of Solid Waste and Emergency Response, Technology Innovation Office, EPA Publication 542-R-92-012, April 1993.

EPA 1993d. *Regulatory Impact Analysis for the Final Rulemaking on Corrective Action Management Units and Temporary Units*. Office of Solid Wastes. January 11, 1993.

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2. SUPERFUND REMOVAL ACTIONS

2.1 INTRODUCTION

This chapter presents the methodology used to estimate the total amount of one-time hazardous wastes generated from Superfund removal actions for the years 1993, 1999, and 2013 on a State-by-State basis. Generally, these are short-term actions taken to respond promptly to an urgent clean-up need. Removal actions can include cleanup or removal of released substances from the environment; actions in response to the threat of a release; actions that may be necessary to monitor, assess, and evaluate the release or threat; disposal of removed material; or other actions needed to prevent, minimize, or mitigate damage to public health, or welfare, or to the environment. Only those hazardous wastes requiring off-site commercial treatment or disposal are included in this study.

2.2 DATA SOURCES

EPA used three data sources for estimating one-time waste volumes from CERCLA removal actions:

(1) *Superfund Emergency Response Actions, A Summary of Federally Funded Removals, Sixth Annual Report-Fiscal Year 1991*. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC, EPA/540-R-92-020, PB92-963421, October 1992;

(2) 1991 Biennial Report data; and

(3) *Cleaning Up the Nations Waste Sites: Markets and Technology Trends.* United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Technology Innovation Office, Washington, DC, EPA542-R-92-012, April 1993. (TIO report)

The Superfund Emergency Response Actions Annual Report for 1991 provided brief descriptions of all removal (i.e., emergency response) actions completed in 1991 and summary data for all removal actions from 1980 to 1991, including the number of removals in each State. The removal or emergency response actions include a wide variety of activities such as supplying alternative drinking water supplies, removing wastes from the site, and stabilizing wastes on site to prevent releases prior to planned remedial actions. EPA used these data to project the number of future removals in each State and to identify a typical waste volume per site. The 1991 Biennial Reports and the TIO report provided data on the allocation of wastes to CAP Management Categories.

2.3 METHODOLOGY

The methodology for estimating one-time waste volumes from CERCLA removal actions uses historical data to project State-by-State volumes for each year from 1992 to 1999. EPA assumed constant annual waste generation from 1999 to 2013.

2.3.1 Removal Actions Nationally Each Year Through 1999

Using regression analysis, EPA projected the number of removal actions nationwide each year from 1992 to 1999 based on the number of removals each year from 1987 to 1991. EPA chose the years 1987 to 1991 because the years prior to 1987 include the start-up years for the Superfund program when the annual rate of increase in the number of removal actions was much higher than it has been in recent years. A regression analysis based on the number of removals from 1980 to 1991 would produce unrealistically high projections of future removals. For example, such a regression would project 563 removals in 1999, whereas the regression based on recent trends (i.e., 1987 to 1991) projects 289 removals in 1999. Exhibit 2-1 presents the number of removal actions each year from 1993 to 2013 based on the approaches in this step of the methodology.

2.3.2 Number of Removal Actions in Each State

To project the number of removal actions completed in each State in future years, EPA multiplied the estimated number of removal actions nationwide (described above) by the percentage of all past removal actions in each State. This approach assumes that each State's share of future removal actions will be equal to its share of completed removal actions. State-by-State percentages of completed removals were calculated by dividing the number of removal actions completed in each State from 1980 to 1991 by the total number of removal actions completed nationwide during the same period. The percentages for all States add to 100 percent. Exhibit 2-2 lists the percentages calculated for each State. These percentages are assumed to remain constant in the future. Thus, a State's share of the number of removals completed nationwide is expected to be the same in 1993, 1999, and 2013.

2.3.3 Annual Volume Managed Off Site

EPA estimated the volume of hazardous wastes from CERCLA removal actions by multiplying the projected number of removal actions in each State (calculated in the previous step) by (1) the percentage of removals that generate wastes for off-site management and (2) the average volume of waste managed off-site at a sample of removal action sites. These two factors are described below.

Percentage of Removals that Generate Hazardous Wastes Managed Off Site

Many removal actions generate no one-time wastes (e.g., construction of fences or berms around contaminated areas) or wastes managed on-site only. To eliminate these removal actions from the one-time waste projections, EPA multiplied the projected number of sites in each State by 44 percent, the portion of removal actions expected to generate waste for off-site management. This percentage was calculated by dividing the number of 1991 removals judged to involve off-site Subtitle C management (92) by the total number of 1991 removals described in the annual report (208). Because many descriptions of removal actions do not clearly identify the nature of off-site management, the percentage reflects some assumptions, specifically:

- Off-site management was RCRA Subtitle C management unless otherwise indicated by the report or unless the waste was clearly not a RCRA hazardous waste.

- Off-site staging of waste was counted as off-site RCRA Subtitle C management because the wastes will eventually be treated and/or disposed.

Exhibit 2-1
Projected Number of Removal Actions Nationwide from 1992 to 2013

Year	Number of Removals Nationwide
1992	268
1993	271
1994	274
1995	277
1996	280
1997	283
1998	286
1999	289
2000 to 2013	289

Average Volume of Waste Per Removal With Off-site Management

The average waste volume per removal is calculated from 1991 BRS data. EPA retrieved data from the 1991 BRS for wastes from CERCLA Emergency Responses (Biennial Report Form GM, source code A62) that were managed off site. This produced waste volume data for 17 sites with a total volume of 5,423 tons, and an average volume per site of 319 tons. To calculate waste volume estimates, EPA multiplied the average volume per site (319 tons) by the State-by-State and year-by-year estimates of the number of removal actions generating one-time waste for off-site management.

Exhibit 2-2
Projected Removal Actions in 1993, 1999, and 2013

State or Territory	Number of Removals 1980 to 1991	Percent of All Removals	Projected Number of Removals		
			1993	1999	2013
Alabama	23	1.33	3.6	3.9	3.9
Alaska	5	0.29	0.8	0.8	0.8
American Samoa	7	0.41	1.1	1.2	1.2
Arizona[a]	15	0.87	2.4	2.5	2.5
Arkansas	14	0.81	2.2	2.3	2.3
California	84	4.87	13.2	14.1	14.1
Colorado	45	2.61	7.1	7.5	7.5
Connecticut	11	0.64	1.7	1.8	1.8
Delaware	15	0.87	2.4	2.5	2.5
District of Columbia	0	0	0	0	0
Florida	52	3.02	8.2	8.7	8.7
Georgia	66	3.83	10.4	11.1	11.1
Guam	9	0.52	1.4	1.5	1.5
Hawaii	4	0.23	0.6	0.7	0.7
Idaho	14	0.81	2.2	2.3	2.3
Illinois	43	2.49	6.8	7.2	7.2
Indiana	59	3.42	9.3	9.9	9.9
Iowa	10	0.58	1.6	1.7	1.7
Kansas	15	0.87	2.4	2.5	2.5
Kentucky	39	2.26	6.1	6.5	6.5
Louisiana	19	1.10	3.0	3.2	3.2
Maine	10	0.58	1.6	1.7	1.7
Marianas[b]	25	1.45	3.9	4.2	4.2
Maryland	24	1.39	3.8	4.0	4.0
Massachusetts	58	3.36	9.1	9.7	9.7

Exhibit 2-5 (continued)
Projected Removal Actions in 1993, 1999, and 2013

State or Territory	Number of Removals 1980 to 1991	Percent of All Removals	Projected Number of Removals		
			1993	1999	2013
Michigan	73	4.23	11.5	12.2	12.2
Minnesota	13	0.75	2.0	2.2	2.2
Mississippi	29	1.68	4.6	4.9	4.9
Missouri	69	4.00	10.8	11.6	11.6
Montana	11	0.64	1.7	1.8	1.8
Nebraska	14	0.81	2.2	2.3	2.3
Nevada	7	0.41	1.1	1.2	1.2
New Hampshire	45	2.61	7.1	7.5	7.5
New Jersey	96	5.57	15.1	16.1	16.1
New Mexico	8	0.46	1.3	1.3	1.3
New York	114	6.61	17.9	19.1	19.1
North Carolina	74	4.29	11.6	12.4	12.4
North Dakota	4	0.23	0.6	0.7	0.7
Ohio	60	3.48	9.4	10.1	10.1
Oklahoma	15	0.87	2.4	2.5	2.5
Oregon	11	0.64	1.7	1.8	1.8
Pennsylvania	118	6.84	18.50	19.8	19.8
Puerto Rico	3	0.17	0.5	0.5	0.5
Rhode Island	11	0.64	1.7	1.8	1.8
South Carolina	30	1.74	4.7	5.0	5.0
South Dakota	8	0.46	1.3	1.3	1.3
Tennessee	14	0.81	2.2	2.3	2.3
Texas	97	5.63	15.2	16.3	16.3
Utah	11	0.64	1.7	1.8	1.8
Vermont	7	0.41	1.1	1.2	1.2

State or Territory	Number of Removals 1980 to 1991	Percent of All Removals	Projected Number of Removals		
			1993	1999	2013
Virginia	10	0.58	1.6	1.7	1.7
Virgin Islands	3	0.17	0.5	0.5	0.5
Washington	19	1.10	3.0	3.2	3.2
West Virginia	52	3.02	8.2	8.7	8.7
Wisconsin	24	1.39	3.8	4.0	4.0
Wyoming	8	0.46	1.3	1.3	1.3
Total	1,724	100	271	289	289

[a] Includes two removals within the Navajo Nation.
[b] Formerly the Pacific Trust Territories (excludes Guam).

2.3.4 Allocation of Wastes to CAP Management Categories

EPA allocated waste to CAP Management Categories based on waste codes for removal action wastes reported in the 1991 BRS. This step uses the same data that were used to determine the average volume of waste per removal. EPA used these data to identify percentage of the waste bearing waste codes for metals, organics, or both:

- 16 percent contaminated with organic constituents only;
- 64 percent contaminated with metals only; and
- 20 percent contaminated with both.

To use these data to allocate wastes to CAP management categories, EPA assumed that:

- Wastes contaminated with organic constituents are managed in Incineration-Sludge/Solids;
- Wastes contaminated with metals are managed in Stabilization/Chemical Fixation; and
- Wastes contaminated with both contaminant types are managed in both categories.

To calculate the volume of residuals managed in RCRA Subtitle C landfills, EPA assumed that the following wastes are managed in Subtitle C landfills:

- 28 percent of all residuals from incinerating organics;
- 30 percent of all residuals from stabilizing metals; and

- 95 percent of residuals from incineration followed by stabilization of mixed organic and metal wastes.

The remaining residuals are assumed to be managed in RCRA Subtitle D landfills. These factors are based on analysis of waste codes and management types for removal action wastes in the 1991 BRS. (ICF Incorporated 1993) EPA developed these portions by assuming that all treatment residuals of characteristic wastes are managed in Subtitle D landfills and all treatment residuals of wastes containing listed wastes or listed and characteristic wastes are managed in Subtitle C landfills. (EPA used a similar approach for Superfund remedial action wastes.)

A residuals factor of 1.5 is multiplied by the waste volume stabilized to account for the increase in volume resulting from the remedy. Incineration is assumed not to change waste volumes (i.e., residuals factor of 1) because one-time wastes are dominated by soils which are not significantly reduced in volume by incineration. These residuals factors are based on the results of a literature review (Peretz, 1992).

EPA multiplied the percentages of waste in CAP Management Categories and the residuals factors by each State-by-State and year-by-year one-time waste volume estimate to determine the capacity demands for each State in each year through 2013.

2.4 REFERENCES

EPA 1993. Cleaning Up the Nations Waste Sites: Markets and Technology Trends. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Technology Innovation Office, Washington, DC, EPA542-R-92-012, April 1993. (TIO report).

EPA 1992. Superfund Emergency Response Actions, A Summary of Federally Funded Removals, Sixth Annual Report-Fiscal Year 1991. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC, EPA/540-R-92-020, PB92-963421, October 1992.

ICF Incorporated 1993. "Analysis of 1991 BRS Data on the Management of Superfund Removal Action Waste." Memorandum to Bill Sproat, Radian, from John Trever and Mike Berg, ICF Incorporated. November 23.

Peretz, J., 1992. "Basis and References for the Treatment Factors Used in the HAZRAM Model for Projecting Secondary Treatment Demand," December 1992, in report entitled *Hazardous Waste Residuals Assessment Model.*

3. RCRA CORRECTIVE ACTIONS

3.1 INTRODUCTION

To estimate the amount of hazardous waste that will require treatment and disposal capacity at commercial hazardous waste management facilities as a result of RCRA corrective actions, EPA identified the universe of RCRA facilities subject to corrective action requirements, developed a method to estimate the extent of contamination at each facility, forecast management practices for cleanup wastes, and predicted the timing and duration of remediation. This chapter explains the steps EPA took to obtain its state-by-state results.

3.2 BACKGROUND AND DATA SOURCES

3.2.1 Regulatory Background of RCRA Corrective Action

Under RCRA, Congress authorized EPA to promulgate regulations addressing the problems associated with the improper management of hazardous wastes. In 1984, Congress enacted the Hazardous and Solid Waste Amendments (HSWA), which significantly expanded the requirements. In particular, sections 3004(u) and (v) of the amended statute require corrective action for both on-site and off-site releases to all environmental media from solid waste management units (SWMUs) at RCRA hazardous waste treatment, storage, and disposal facilities (TSDFs). EPA codified the corrective action mandates in its regulations at 40 CFR 264.101. EPA Regions and authorized States (currently 18 states) are implementing the corrective action program and are expected to continue characterizing, ranking, and remediating existing contamination at TSDFs well into the next century. The corrective action program will also address future contamination that occurs.

On February 16, 1993, EPA promulgated the CAMU/TU final rule (58 *Federal Register* 8658). This rule established two new types of units that will be used to facilitate remediations under RCRA corrective action authorities. Both tend to reduce, though not necessarily eliminate, the volume of waste sent off site to commercial facilities. A TU is a unit that allows the owner or operator at a facility to treat or store remediation waste, for a limited period of time, without complying with RCRA land disposal restrictions (LDRs) and minimum technology requirements (MTRs). A CAMU is an area within a facility that is designated by the Regional Administrator for the purpose of implementing corrective action remediation. A CAMU may include non-contiguous areas of contamination. Potentially, all cleanup waste and soil generated at a facility undergoing corrective action could be managed in a single CAMU. Alternatively, more than one CAMU can be used at a facility, with remediation wastes and contaminated media moved from one CAMU to another without triggering the LDRs. In the absence of CAMUs, the hazardous waste that is excavated at a facility would have to meet land disposal restrictions treatment standards before being land disposed.

EPA developed an approach to estimate the impact of Corrective Action Management Units (CAMUs) on remediation wastes shipped off-site for Subtitle C management by using data presented in the CAMU rule and RCRA corrective action RIA. The 43 percent factor equals the estimated annual volume of soil triggering the LDRs at corrective action facilities implementing the CAMU planning builds directly on EPA's RIAs for the corrective action and CAMU/TU rules (an EPA concept that appears in the final CAMU rule (0.47 million tons per year) *divided by* the estimated annual volume of soil triggering the LDRs at corrective action facilities that would be cleaned up following the CAMU concept that appears in the proposed CAMU rule (1.1 million tons per year). These soil estimates were generated by the RCRA corrective action RIA model, which is based on detailed site-specific data for a stratified random sample of RCRA corrective action facilities. For For more information, see CAMU final rule published on February 16, 1993 (58 Federal Register 8658).

3.2.2 Corrective Action and CAMU/TU RIAs

EPA's methodology for estimating one-time hazardous waste generation for capacity assurance planning builds directly on EPA's RIAs for corrective action and CAMU/TU rules (EPA 1993a and 1993b). These RIAs are available for public review.

RIA Sample Selection

EPA derived the sampling frame of 5,397 non-federal facilities from the Hazardous Waste Data Management System (HWDMS) and the Corrective Action Reporting System (CARS) (now superseded by the RCRA Information System (RCRIS)).[1,2] Using a cluster sampling design, EPA sampled the universe of non-federal facilities across three strata based on facility size and RCRA Facility Assessment (RFA) status:[3]

- Large facilities;
- Not large facilities with RFAs completed; and
- Not large facilities without RFAs.

Facilities in the "large" stratum were identified by EPA Regional officials as being the most important facilities in their Region in terms of their need for remediation, based on the facility size and extent of contamination. Facilities classified as "not large" were stratified by RFA status. RFA status is indicative of the likelihood that corrective action will be required, because RFAs tend to be completed sooner at facilities with serious contamination. Facilities in both the "large" stratum and the "not large with RFA" stratum were sampled at a higher rate than their actual occurrence in the universe, so that more detailed information on corrective action costs could be obtained for the RIA. Exhibit 3-1 provides information about the 70 non-federal facilities in the sample, as well as waste generation and management data.

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[1] For more information on the RIA frame and sampling strategy, see EPA 1993a.

[2] The corrective action RIA also considered federal facilities, but these have not been included in EPA's analysis of one-time capacity demand for several reasons. First, the RIA sample considered only a small number of federal facilities (9 out of 359 identified), and consequently the RIA results provide a limited basis for projecting year-by-year capacity demand at the State level. Second, many types of the wastes (e.g., explosives and mixed hazardous/radioactive waste) generated at federal facilities require types of specialized management that are outside the scope of the CAP process.

[3] RFAs are the first step in the corrective action process. Subsequent steps include RCRA facility investigations (RFIs), corrective measures studies (CMSs), and, finally, remediation.

Exhibit 3-1
Characterization of Sample Facilities in Corrective Action RIA

FACILTY IDENTIFIER	FACILTY SIC	FACILITY PERMIT STATUS	INCINERATION QUANTITY (TONS)	STABILIZATION QUANTITY (TONS)	LANDFILL QUANTITY (TONS)
FACILITY 1	2491	1	58	0	0
FACILITY 2	2491	1	0	0	0
FACILITY 3	2812	1	0	0	0
FACILITY 4	2812	4	0	0	0
FACILITY 5	2860	1	0	0	7
FACILITY 6	2869	1	206,114	0	0
FACILITY 7	2879	2	0	67,164	0
FACILITY 8	2879	1	0	0	0
FACILITY 9	2899	1	2,216	0	176
FACILITY 10	2911	1	300,475	159,976	11,722
FACILITY 11	2911	4	0	0	3
FACILITY 12	2911	0	699	0	0
FACILITY 13	2911	1	0	143,807	0
FACILITY 14	2911	1	0	178	193
FACILITY 15	3000	1	0	0	0
FACILITY 16	3339	1	0	1,510	5
FACILITY 17	3480	1	0	192,888	6,192
FACILITY 18	3662	2	0	0	0
FACILITY 19	3672	2	0	37	87
FACILITY 20	3674	2	31,084	0	0
FACILITY 21	3728	1	0	0	0
FACILITY 22	3760	4	0	45,759	0
FACILITY 23	3820	1	0	0	268
FACILITY 24	4953	1	0	0	120
FACILITY 25	4953	2	1,903	1,903	11,417
FACILITY 26	4953	1	27,829	55,658	0
FACILITY 27	2491	2	0	0	0
FACILITY 28	2491	1	0	0	0
FACILITY 29	2800	1	0	0	0
FACILITY 30	2821	1	0	0	0
FACILITY 31	2821	4	0	0	137
FACILITY 32	2834	1	0	0	0
FACILITY 33	2834	1	0	0	0
FACILITY 34	2844	2	121	0	0
FACILITY 35	2869	2	0	10,049	0
FACILITY 36	2911	1	0	149,927	0
FACILITY 37	2911	2	0	15,413	15,413
FACILITY 38	3069	1	116	0	10
FACILITY 39	3316	2	96	101	0
FACILITY 40	3316	0	0	0	0
FACILITY 41	3470	6	0	5,994	6,957
FACILITY 42	3482	2	0	226,404	0
FACILITY 43	3669	1	0	0	0
FACILITY 44	3691	1	0	0	385
FACILITY 45	4214	1	25	43	43
FACILITY 46	4230	1	0	62,333	0
FACILITY 47	4953	0	0	180,722	0
FACILITY 48	4953	1	0	0	0
FACILITY 49	4953	9	0	0	0
FACILITY 50	4953	1	0	0	0
FACILITY 51	5169	2	0	0	0
FACILITY 52	8221	2	0	25	0
FACILITY 53	8221	2	0	0	0
FACILITY 54	2047	1	0	0	0
FACILITY 55	2491	4	0	3,613	0
FACILITY 56	2816	6	864	0	1,079
FACILITY 57	2860	2	0	0	0
FACILITY 58	2869	2	0	0	0
FACILITY 59	2911	4	0	56,837	0
FACILITY 60	3354	4	0	0	0
FACILITY 61	3489	0	2,544	0	0
FACILITY 62	3568	4	0	0	0
FACILITY 63	3674	2	0	0	0
FACILITY 64	3699	4	0	0	0
FACILITY 65	3827	0	0	0	0
FACILITY 66	3840	4	0	2,098	0
FACILITY 67	3840	6	0	0	0
FACILITY 68	4953	1	0	0	0

Remedy Selection Process for RIA Sample

In order to account for the complexity of the decisionmaking process when simulating the selection of remedies, EPA developed an approach that relied on panels of experts to select remedies at the sample facilities. To simulate the type of interactions between EPA and those responsible for the facility cleanups that occur in real-world situations, two kinds of expert panels were convened:

- **Policy Panel:** This panel represented the role of the regulatory agency in setting remedial objectives, requesting additional technical information from the technical panels on the performance of proposed remedies, and making final remedy selection decisions.

- **Technical Panel:** This panel was charged with developing one or more technical remedies for each facility, based on guidance from the policy panel, and estimating the costs of the remedies. Technical panels were encouraged to develop a range of remedies, including those that would represent the facility owner or operator's preference to propose the most cost-effective remedies that would meet the proposed corrective action regulatory objectives.

The policy panels consisted of Regional EPA and State regulatory staff with extensive experience in implementing the corrective action program. Each policy panel consisted of six individuals, usually representing a variety of EPA Regions and States to reduce regional biases.

The technical panels consisted of national remediation experts selected for their facility-specific remedial design experience. Each technical panel comprised individuals representing several disciplines:

- Hydrogeology;
- Geology;
- Geochemistry;
- Soil science;
- Civil, chemical, or environmental engineering; and
- Chemistry.

The technical experts were identified through a competitive search across many well-recognized remediation firms in the United States. Many of the experts had significant RCRA field experience, while most had extensive experience providing investigation and remediation support under the Superfund program. Each technical panel consisted of six members selected to represent a balance of key disciplines listed above. It was always critical that each panel had one or more hydrogeologists and one or more engineers and waste treatment experts. For the most part, the panels divided the work on each facility along lines of technical expertise.

The remedy selection expert panel sessions were conducted over the course of eight weeks in 1991 and 1992. The process involved the use of one policy panel and two technical panels during each of two four-week sessions. The panels evaluated information on the extent of contamination at 59 of the 79 sample facilities (including nine federal facilities) where corrective action was projected to be necessary. The panels did not review the remaining 20 facilities in the sample, as the Agency determined that no further action would be necessary at these facilities because of the absence of contamination.

In the first step of the remedy selection process for a sample facility, the panel members were presented with information characterizing the extent of contamination at each facility in the absence of corrective action (i.e., the baseline extent of contamination). This information included overviews of historical facility operations, waste generation activities, permitting and enforcement status, financial condition, and SWMUs. EPA described the wastes managed in the units and the constituents of most concern in the various media (e.g., soil, air, surface water, and ground water). EPA determined which constituents were of most concern based on the degree to which they exceeded action levels for various media, and on the distance the contamination had traveled from the point of release. When available, the Agency preferred to use monitoring data in characterizing the extent of contamination. For example, soil samples and ground water sampling data were available for a number of facilities that had reached the RFI stage. A multimedia model was used to estimate the extent of contamination when monitoring data were not available to estimate current contamination at a facility, and to predict future contamination. The panels were provided maps presenting the locations of SWMUs at the facility and delineating contaminant plumes. This information was often accompanied by a short summation of facility issues by a facilitator to expedite the panel process.

Next, the policy panel reviewed the facility data and developed remedial objectives for each SWMU and for facility-wide environmental contamination (soils, ground water, surface water, and air). In developing facility-wide objectives, the panels followed the framework of proposed corrective action regulations and indicated target cleanup levels that remedies would have to meet, broad source control objectives (e.g., on-site treatment, off-site treatment, capping wastes in place), and timing objectives. In developing these broad objectives, the policy panel identified the extent of current exposures at the facility and made assumptions concerning the potential future use of the facility. Following the intent of the proposed corrective action regulations, the panel assumed that those facilities with a greater current or future exposure potential would be required to develop more stringent remedial alternatives commensurate with the threat. The policy panel typically expressed remedial objectives as goals rather than specific technologies.

The completed facility remedy objectives were then presented to the technical panel, which developed detailed technical options for remediating the facility based on these objectives. In developing remedies, the technical panels had access to a full library of reference materials on treatment technologies (including innovative technologies), engineering design information, engineering costs, and, for ground water extraction remedies, plume capture computer models. Using these materials, they proposed technical remedies for each facility for remediating ground water, excavating and treating soils, and remediating any other site problems requiring corrective action. Where more than one remedial alternative was feasible, the technical panels presented alternatives for consideration. Finally, the technical panel qualitatively evaluated the performance of each remedial alternative and developed rough cost estimates to allow the policy panel to consider cost as a remedy selection factor.

After receiving the remedial alternatives from the technical panel, the policy panel sometimes requested that additional alternatives be evaluated, or requested minor modifications to a proposed remedy. The technical panel developed this additional information and submitted it to the policy panel. Based on the final information provided by the technical panel, the policy panel selected a final remedy for the facility. After the policy panel selected a final remedy, the technical panel generated its final cost estimate. In the course of estimating costs, the technical panel developed sufficient information for EPA to estimate the volume of hazardous waste that would be generated at a facility.

3.3 METHODOLOGY

This section explains how EPA used the results generated by the expert panels to assign waste generation and management characteristics to all 5,397 facilities in the universe of RCRA facilities (i.e., the non-federal facilities identified in the RCRIS database). Furthermore, it describes EPA's approach for determining when facilities would commence corrective action remediations and for aggregating results to obtain State-by-State estimates for commercial demand for Subtitle C incineration, stabilization, and landfilling in 1993, 1999, and 2013.

3.3.1 Match Waste Generation and Management Practices At Sample and Non-Sample Facilities

EPA's first step in developing a matching process was to identify factors that would predict of the likelihood that corrective action will be needed at a facility and, if corrective action should be performed, the volume of wastes likely to be generated and managed off site. The following seven factors were considered:

(1) **Number and type of solid waste management units (SWMUs).** The more SWMUs that exist at a facility, the greater are the opportunities for releases to the environment that require corrective action. Thus, the number of SWMUs is likely to be positively related to both the likelihood that corrective action will be needed and the amount of off-site capacity demand.

(2) **Stage in corrective action process (e.g., RFA completed).** The further a facility has progressed in the process, the more likely it is that corrective action remediation will occur.

(3) **Facility size.** Large facilities are probably more likely than small facilities to need corrective action because, on average, they contain more SWMUs and corresponding opportunities for releases. Corrective actions at large facilities may also tend to contaminate larger volumes of soil than small facilities because releases may spread further (e.g., to the facility boundary) before the cleanup begins.

(4) **Types of wastes handled at the facility.** The volume of contamination is influenced by the fate and transport characteristics of a waste. The corrective action waste management methods (e.g., in-situ, ex-situ on site, and ex-situ off site) also depend on the waste types. Thus, facilities that handle similar wastes may tend to generate similar volumes of corrective action wastes managed off site.

(5) **Waste management practices at the facility.** This factor influences the likelihood of releases and thereby affects the likelihood that corrective action is required (e.g., corrective action may be more likely when wastes are managed in a surface impoundments than in storage tanks).

(6) **Facility age.** Old facilities, on average, may generate greater volumes of corrective action waste because they have had more opportunities (i.e., more time) than new facilities for releases to the environment to occur and because waste management practices have improved over time.

(7) **Soil, hydrological, and climatic conditions.** These factors affect the fate and transport of wastes released into the environment and therefore influence the volume of wastes that must be managed off site.

EPA faced two major limitations in establishing a set of variables that could be evaluated for possible use in a matching scheme. First, quantitative data are available on only a limited number of parameters for non-sample facilities. Second, the variables available for both sample and non-sample facilities are related only indirectly to the amount of corrective action waste likely to be generated at a RCRA facility and managed off site. EPA was able to identify four variables that were both uniformly available for non-sample facilities and at least indirectly related to the likely capacity demand.

(1) **RIA Sampling Strata.** This variable is a relatively strong indicator of the number of SWMUs and facility size. The corrective action RIA explicitly considered strata in developing its sample set of facilities, and within each strata the RIA shows considerable differences in the number of SWMUs (EPA 1993a). Large facilities have roughly 1,300 SWMUs on average. Not large facilities that have completed RCRA Feasibility Assessments (RFAs) have roughly 790 SWMUs, while not large facilities that have not completed RFAs have roughly 180 SWMUs. Because the strata variable distinguishes not large facilities that have or have not completed RFAs, it indicates a not large facility's stage in the corrective action process. The relationship between strata and stage in corrective action process has been rated as moderately strong, however, because the sampling strata do not supply information about the corrective action stage of large facilities.

RIA sample strata appears to be the best of the four available variables for matching sample and non-sample facilities, largely because the factors for which it was rated strong or moderate — number and type of SWMUs, facility size, and stage in corrective action process — are particularly good indicators of capacity demand from remediation, relative to the other indicators.

(2) **Industry.** Industry is strongly related to the types of waste generated at a facility because of the common chemical inputs, outputs, and processes. While industry is an indicator of waste management practices at a facility, EPA judged this relationship to be moderately strong because a wide range of systems can be used to manage similar wastes. In addition, the type of industry occurring at a facility tends to be somewhat correlated with its age because facilities producing similar products tend to face similar economic and financial environments.

(3) **Permit Status.** A facility's likelihood of requiring corrective action can sometimes be inferred by its permit status. For example, closing facilities required to obtain post-closure permits are more likely to require corrective action than closing facilities not required to obtain post-closure permits, because such permits indicate that hazardous waste has been managed in land-based units and will remain on site after closure. Permit status is also

moderately correlated with the number and type of SWMUs at a facility; for example, facilities with a permit by rule are likely to have few SWMUs.

(4) **Location.** This factor is related to the soil, hydrological, and climatic conditions at a facility. This relationship is rated as moderately strong because a variety of soil, hydrological, and climactic conditions may occur within a particular State or EPA Region.

EPA developed a matrix to organize the evaluation of these four variables. See Exhibit 3-2. For each combination of the four variables and the seven factors predicted to contribute to off-site capacity demand, EPA assigned a strong, moderate, or weak rating to express the strength of the relationship, as described above.

Exhibit 3-2
Relative Strength of Relationship Between Potential Predictors of Corrective Action Volumes and Variables Used in Similarity Comparisons

Predictive Factor of Capacity Demand	Variables for Matching Sample and Non-sample Facilities			
	RIA Sample Strata	Industry	Permit Status	Location (EPA Region or State)
Number and Type of SWMUs	Strong	Weak	Moderate	Weak
Stage in Corrective Action Process	Moderate	Weak	Moderate	Weak
Facility Size	Strong	Weak	Weak	Weak
Waste Types	Weak	Strong	Weak	Weak
Waste Management Practices	Weak	Moderate	Weak	Weak
Age	Weak	Moderate	Weak	Weak
Soil, Hydrological, and Climactic Conditions	Weak	Weak	Weak	Moderate
Overall Evaluation	Strong	Moderate	Moderate to Weak	Weak

Because strata appears to be the most relevant factor in predicting capacity demand, EPA determined that only sample facilities belonging to the same strata as the non-sample facility should be considered further in identifying the most appropriate sample facility for transferring waste generation and waste management data to a non-sample facility.

Following strata in order of importance are SIC code, permit status, and location, respectively, as shown in Exhibit 3-2. Based on these results, EPA decided that industry should be considered twice as important as permit status and that permit status should be considered twice as important as location. To implement this system, EPA started by choosing 1000 points as a maximum value to award a sample facility when it matched the three-digit SIC code (i.e., industry) of a non-sample facility. In turn, EPA set 500 points as the maximum value for permit status, and 250 points as the maximum value for location. Thus, the maximum total score is 1750 points.

For each of the three factors — industry, permit status, and locale — used in scoring the similarity between sample facilities and a given non-sample facility, EPA used three different fractions of the maximum points possible for evaluating combinations of characteristics for a sample facility and a non-sample facility:

(1) **All Points.** When a sample facility and a non-sample facility had the same value for the factor being considered, the maximum value was assigned.

-- If a sample facility had the same three-digit SIC code as a non-sample facility, it was awarded 1000 points.[3]

-- If a sample facility had the same permit status as a non-sample facility,[4] 500 points were awarded to the sample facility.

-- If a sample facility was in the same State as the non-sample facility, 250 points were awarded.

(2) **No Points.** When a sample facility and a non-sample facility were dissimilar with regard to the variable being considered, no points were assigned.

(3) **Half Plus One Points.** When a sample facility and a non-sample facility had a similar but not identical value for the variable being considered, one more than half of the maximum number of points were assigned, so that even a partial match for a given variable was more significant in determining a match than any next less important variable.

-- For a sample facility with the same two-digit but not three-digit SIC code as a non-sample facility, 501 points were awarded.[5]

-- For a sample facility with a similar permit status as a non-sample facility, 251 points were awarded.

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[3] Because a significant number of facilities perform industrial activities that could be classified under multiple four-digit SIC codes and each facility is assigned only one four-digit code, three-digit codes are used to compare the industrial activities at sample and non-sample facilities.

[4] For an explanation of how "same" and "similar" permit statuses were determined, see ICF Incorporated, 1993.

[5] A match at the one-digit SIC level received no points because this match is insufficiently indicative of similarity in waste management and waste management characteristics.

-- For a sample facility in the same EPA Region but not the same State as a non-sample facility, 126 points were awarded.

These results are summarized in Exhibit 3-3.

Exhibit 3-3
Decision Rules for Assigning Points to Sample Facilities

Variables Compared	Points Allocated
Sampling Strata	
Only sample facilities with same stratum as a non-sample facility are considered for further evaluation	--
Industry	
Same 3-digit SIC	1000
Same 2-digit SIC, but different 3-digit SIC	501
Permit Status	
Same permit status	500
Similar permit status	251
Location	
Same State	250
Same EPA Region, but different State	126

The matching process also included the following rules:

- In cases where more than one sample facility received the same highest score for a non-sample facility, the sample facility to be matched with the non-sample facility was selected randomly from among the tied sample facilities. Over 85 percent of large facilities and over 65 percent of not large facilities had a unique sample facility with the highest similarity score. The average highest similarity score for the sample facilities matched to non-sample facilities using this process is 745 out of a maximum possible score of 1750. As stated above, all sample facilities had the same stratum as their matched non-sample facilities.

- Non-sample facilities that were among the sample facilities were matched to themselves.

EPA considered and rejected two other approaches for projecting one-time corrective action waste volumes:

(1) EPA determined that using Monte Carlo modeling to match non-sample facilities to RIA sample facilities within each of the three strata would require too large a level of effort and would not provide enough flexibility to allow for modelling assumptions to be altered.

(2) EPA evaluated an approach that would have projected volumes by matching waste generation data from the 1986 National Screening Survey (also known as the GENSUR) with waste management data from the 1987 National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (also known as the TSDR Survey). EPA decided not to pursue this approach because these data sources are dated in comparison to the sample facility database developed for the corrective action RIA.

3.3.2 Simulate the Timing of Corrective Action Remediation

The timing and number of corrective action remediations within each State depends on many variables; several of them are difficult to project into the future. Important determinants of the pace of corrective action implementation within a State include the EPA Regional and State strategy for implementing the corrective action program, the number and type of facilities within the State, and the available budget.

EPA simulated the timing of corrective action remediations within each State by using data developed by the Office of Solid Waste to estimate the proportions of facilities that would progress far enough through the corrective action process to commence remediation in each of three time periods:

(1) **1992.** The percentages for the first period, as shown in Exhibit 3-4 reflect actual progress at the Regional level in implementing the corrective action program (EPA 1991 and EPA 1993e). Specifically, these percentages are based on the average rate of progress from 1989 through 1992.

(2) **1993 to 2002.** Based on the pace of remediations in the last several years, EPA projects that by the end of 2002, roughly 20 percent of the facilities requiring corrective action will have begun remediation (EPA 1993e). Because some facilities started remediation prior to 1993, EPA has assumed an annual rate of new remediations of two percent over the period. In other words, 20 percent of all facilities will commence corrective action remediation in this period. The Agency did not differentiate among Regions in applying this percentage.

(3) **2003 to 2013.** Lacking other data, EPA assumed that this same rate of remediation starts would continue through the third period, 2003 to 2013. Thus, 22 percent of the facilities requiring corrective action will begin remediation during this 11 year period.

Exhibit 3-4
Estimated Corrective Action Remediation Starts over Time

EPA Region	Percentage of remediations started in 1992	Percentage of remediations started 1993 - 2002	Percentage of remediations started 2003 - 2013
I	0.0	20	22
II	0.5	20	22
III	0.3	20	22
IV	0.3	20	22
V	0.3	20	22
VI	0.7	20	22
VII	0.4	20	22
VIII	0.9	20	22
IX	0.1	20	22
X	2.4	20	22

In Exhibit 3-4, the figures for each Region do not sum to 100 percent for two reasons: (1) some facilities commenced remediation prior to 1992; and (2) not all facilities needing corrective action will commence remediation by 2013.

To apply these Regional percentages to specific states, EPA used the following four-step procedure:

(1) For each State, EPA identified the number of facilities (using the matches to sample facilities) that will generate a demand for capacity in each CAP Management Category (before, during, or after the 1992-2013 timeframe). For example, a hypothetical State with 200 RCRA facilities might have 10 facilities that will create a demand for incineration, 20 for stabilization, and 5 for landfill.

(2) For each of these CAP Management Categories, EPA determined the average amount and duration of the demand by the facilities in each State with such a demand. Using the example above, the average demand for incineration would be the total demand for incineration by all 10 facilities with such a demand divided by 10. The average duration was determined in the same manner and rounded off to a whole number of years. Most durations were one year; a few were two years.

(3) EPA calculated the number of facilities that would create a demand for each CAP Management Category in each projection period in each State, using the

Regional rates of new corrective action remediations described above. For example, if the hypothetical State identified above is located in Region I, then:

-- 0 percent of the 10 facilities with a demand for incineration (0 facilities) would be allocated to 1992;

-- 20 percent (2 facilities) would be allocated to the period from 1993 to 2002; and

-- 22 percent (2.2 rounded to 2 facilities) would be allocated to the period from 2003 to 2013.

(4) Finally, EPA randomly assigned starting years to each of the facilities with a demand for each CAP Management Category in each projection period using a computer-driven random number generator. For example, each of the two facilities with a demand for incineration during 1993 to 2002 would be randomly assigned to a starting year in that period. If the average duration of the demand is two years, the facility would show a demand for incineration in the randomly assigned year and the following year.

This procedure has several advantages. It reduces significant year-to-year fluctuations in demand by using the average demand for capacity by CAP Management Category. It also avoids the need to predict when corrective action will start at each facility.

3.3.3 Aggregate Volumes by CAP Management Category

EPA used the methodology described above to project the demand for incineration, stabilization, and landfill capacity demand in all years from 1992 through 2013. The demand for each type of capacity in each year was summed across facilities to determine the total demand in each year.

These results show that the projected volume of one-time waste requiring disposal at Subtitle C landfills is small relative to the volumes for incineration and stabilization. The expert panels that selected remedies for sample facilities were able to specify disposal at hazardous or nonhazardous landfills, and they often chose disposal in nonhazardous landfills, evidently because many wastestreams were characteristic hazardous wastes (i.e., exhibited one of the characteristics indicated in 40 CFR 261.23 — ignitability, corrosivity, reactivity, or toxicity) and required no further Subtitle C management after decharacterization through incineration and/or stabilization.

3.5 REFERENCES

EPA 1993a. "Corrective Action Program Accomplishments" briefing given to the Office Director by PSPD staff. June 18.

EPA 1993a. *Regulatory Impact Analysis for the Final Rulemaking on Corrective Action for Solid Waste Management Units: Proposed Methodology for Analysis,* draft. Office of Solid Waste. March.

EPA 1993b. *Regulatory Impact Analysis for the Final Rulemaking on Corrective Action Management Units and Temporary Units.* Office of Solid Waste. January 11.

EPA 1993c. *List of Non-Federal RCRA TSDFs* Included in EPA's Analysis of One-Time Waste from Facilities Undergoing Corrective Action Remediations. November.

EPA 1993d. *Cleaning Up the Nation's Waste Sites: Markets and Technology Trends.* Office of Solid Waste and Emergency Response, Technology Innovation Office, Washington, DC, EPA542-R-92-012. April.

EPA 1993e. "Corrective Action Program Accomplishments" briefing, given to the Office Director by PSPD staff. June 18.

EPA 1991. "RCRA Implementation" briefing, given to the Office Director by PSPD staff. December.

ICF Incorporated 1993. "Explanation of Permit Status Categories," memorandum to Robert Burchard, U.S. EPA, OSW/WMD, from John Trever, Reid Harvey, and Mike Berg, December 22.

Tonn, B., H. L. Hwang, S. Elliott, J. Peretz, R. Bohm, B. Jendrucko 1993. *Methodologies for Estimating One-time Hazardous Waste Generation for Capacity Assurance Planning*, Oak Ridge National Laboratory and the University of Tennessee-Knoxville, October.

4. UNDERGROUND STORAGE TANKS CONTAINING HAZARDOUS SUBSTANCES

4.1 INTRODUCTION

This chapter presents the methodology used to estimate the total amount of one-time hazardous waste generated from cleanups of releases from underground storage tanks (USTs) containing hazardous substances for the years 1993, 1999, and 2013. Section 4.2 describes the data sources used to develop these one-time waste estimates.

4.2 DATA SOURCES

EPA used three data sources for estimating one-time waste volumes from cleanups of releases from USTs containing hazardous substances:

(1) *Underground Storage Tanks: Resource Requirements for Corrective Action*. Donna Synstelien Bueckman, Sunita Kumar, and Milton Russell, University of Tennessee, Knoxville, December 1991;

(2) Survey of Underground Storage Tanks for 1990 and 1991. Conducted by CRM Associates for EPA's Office of Underground Storage Tanks; and

(3) *Chemicals Stored in USTs: Characteristics and Leak Detection*. United States Environmental Protection Agency, Office of Research and Development, Washington, DC, EPA/600/2-91/037, August 1991; and

The report by Bueckman *et al.* provided a detailed description of a cost estimation method and a simulation model developed by its authors, including the model's parameters, justification for those parameters, and the source of data used to establish the baseline numbers and project future numbers of regulated petroleum and hazardous substance tanks. EPA adopted many of the model's assumptions and parameters, such as values for release rates and changes over time in the UST population.

The 1990 and 1991 surveys of USTs conducted by CRM Associates for the Office of Underground Storage Tanks (the OUST report) provided data on the number, age, construction, contents, and level of protection of USTs by State. EPA used these data in establishing the size of the hazardous substance UST population in the base year and in projecting future numbers of tanks over time.

The Office of Research and Development's (ORD) report, *Chemicals Stored in USTs: Characteristics and Leak Detection*, provided another source of data on (1) the number of USTs containing chemicals (i.e., hazardous and non-hazardous substances other than petroleum) in several States, the percentage of those USTs that contained hazardous substances, and (2) the types of hazardous substances stored in these USTs. EPA used the first set of data in this report to develop a factor for predicting the percentage of the UST population identified from the OUST report data whose releases would generate RCRA hazardous waste. EPA also used these data to estimate the number of hazardous substance USTs in the States for which data were provided in that report. EPA used the second set of data in this report to predict the management practices for RCRA hazardous waste generated from cleanups of such releases.

4.3 METHODOLOGY

Essentially, this model is based on four independent variables: (1) the number of hazardous substance USTs, (2) the percentage of hazardous substance USTs with releases, (3) the average volume of hazardous waste resulting from a release that is managed off-site, and (4) the allocation of off-site waste volumes to appropriate CAP Management Categories.

4.3.1 The Number, Age, and Protection Status of Hazardous Substance USTs

Estimating one-time hazardous waste generation from UST cleanups requires data on the number of USTs containing hazardous substances in each State broken down by tank age and protection status. The ORD report contains data on the number of hazardous substance USTs in 14 States (EPA 1991, p. 14, Table 1) and estimates that all hazardous substance USTs comprise approximately one percent of the total tank population. (EPA 1991, p. 4 and EPA 1991, Appendix A). Using this assumption, the number of hazardous substance USTs was estimated for the remaining States using data from the total number of USTs by State in the annual OUST surveys. The tank age and protection status for the hazardous substance USTs in all States was then estimated based on the OUST survey data.

In estimating the age and protection status of USTs, the method, relying on an approach developed by Bueckman *et al.*, first assigns tanks to age categories and then subdivides the categorized tanks into two groups: protected and unprotected. These steps were performed using data on tank characteristics that were collected as part of the OUST survey. The age categories to which tanks are assigned are: 0-5 years, 6-10 years, 11-15 years, 16-20 years, and greater than 20 years. A tank was considered protected if it was classified as having cathodic protection, having an interior lining, being constructed of fiberglass-reinforced plastic, or having other protection. It is important to note that this protection status simply indicates compliance with petroleum UST regulations, and does not indicate compliance with the more stringent secondary containment protection status required for hazardous substance USTs by 1998.[6] If the tanks protection status was "none" or "unknown," then it was classified as unprotected. The effective life of a tank is assumed to be 20 to 25 years, irrespective of protection status.

The OUST survey of USTs undertaken in 1991 is taken as an indicator of the number, age distribution, and protection status of USTs by State at the beginning of 1992. For States not covered by the ORD report, these "1992" data on the number of tanks have been compared with the "1990" data used by Bueckman *et al.* as a check on consistency. In those instances where the two data sets were not consistent, the 1992 data were used in place of the 1990 data.[7] The 1990 data were

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[6] According to 40 CFR 280.21, all existing tanks are required to be upgraded, or protected, to prevent releases due to structural failure or corrosion by December 22, 1998.

[7] For several states, the 1992 number of tanks reported, either in total or for a specific age category, was significantly larger than the 1990 number of tanks. Because the 1992 data are more current, they are assumed to be relatively "more correct" than the 1990 data. Hence, the 1992 data were used to adjust the 1990 input data set.

replaced in whole or in part with the 1992 data for the following States: Alaska, California, Georgia, Hawaii, Kansas, Kentucky, Louisiana, Maryland, Michigan, Nevada, New Jersey, Puerto Rico, and Wisconsin. The assumption that one percent of USTs contains hazardous substances was then applied evenly across the tank age and protection status categories for the States not covered by the ORD report to produce estimates of the number of tanks containing hazardous substances in each age-protection status cohort for each State in the base year. The distribution of States covered by the ORD report was assumed to be the same as the distribution for all other States combined. The estimated number of hazardous substance tanks in 1990 by State, age, and protection status is presented in Exhibit 4-1. (This exhibit does not address tanks after the projection period ending in 1999 because, as discussed in Section 4.3.2, all hazardous substance USTs must have secondary containment protection by the end of 1998 and all such tanks are assumed to have no releases requiring off-site waste management.)

The tanks in each age-protection status cohort are then "aged" over the projection horizon by five year intervals using assumptions developed by Bueckman *et al* for petroleum USTs. Although Bueckman *et al* also developed an algorithim to age the protected tanks, it is not used in this methodology. Protected tanks, as noted above and discussed further below, are assumed to have no releases and therefore do not create a demand for off-site waste management.

In their aging, unprotected tanks may be subjected to one of four actions during the projection period:

- Remain open without upgrading (until the end of 1998, the regulatory deadline for secondary containment protection);
- Close according to formal closure procedures without being replaced;
- Be replaced with a new protected tank; or
- Add protection and thereby become a protected tank.

Exhibit 4-1
Estimated Number of Hazardous Substance USTs by State, Tank Age, and Tank Protection Status

State	Protected Tanks					Unprotected Tanks				
	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	> 20 years	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	> 20 years
Alabama	3	8	4	6	2	1	2	2	3	1
Alaska	0	0	0	0	0	1	5	1	0	2
American Samoa	0	0	0	0	0	0	0	0	0	0
Arizona	4	1	0	1	0	7	5	2	5	2
Arkansas	3	1	2	1	0	3	2	5	1	0
California	42	56	54	40	333	66	92	88	65	1858
Colorado	3	1	2	1	1	4	7	12	6	3
Connecticut	14	18	17	15	50	2	6	8	6	39
Delaware	0	0	0	0	1	1	1	1	0	8
District of Columbia	1	0	0	0	0	2	1	1	0	2
Florida	5	5	5	3	10	5	11	13	12	43
Georgia	10	10	35	1	2	3	3	16	1	1
Guam	0	0	0	0	0	0	0	0	0	0
Hawaii	0	1	0	0	0	0	2	1	0	1
Idaho	4	0	2	0	4	3	0	5	1	14
Illinois	86	94	86	71	76	63	231	339	382	631
Indiana	16	23	19	22	121	18	25	26	31	205
Iowa	3	5	3	3	3	1	9	8	8	8
Kansas	1	0	1	0	1	1	0	3	0	14
Kentucky	3	0	0	0	3	4	1	1	1	19
Louisiana	0	0	0	0	2	0	0	0	0	5
Maine	8	30	56	12	82	0	0	0	0	4
Maryland	7	2	1	2	4	16	16	10	19	42
Massachusetts	3	1	1	1	1	4	3	5	7	8
Michigan	17	7	7	8	10	21	43	58	67	111
Minnesota	5	15	10	5	22	1	6	7	3	27
Mississippi	10	4	3	2	1	4	9	13	6	4
Missouri	18	20	9	7	16	18	46	28	22	58
Montana	5	1	1	1	4	11	14	7	9	24
Nebraska	3	1	0	1	1	1	2	1	3	6
Nevada	1	0	0	0	0	2	0	2	0	2
New Hampshire	3	1	1	0	0	3	8	7	5	3
New Jersey	18	13	11	9	16	16	30	31	28	57
New Mexico	1	0	0	0	0	1	1	1	1	1
New York	31	19	11	13	24	62	143	145	190	299
North Carolina	32	58	80	33	50	8	19	33	17	43
North Dakota	2	1	0	0	0	3	3	1	0	1
Northern Marianas	0	0	0	0	0	0	0	0	0	0

Exhibit 4-1 (continued)
Estimated Base Year (1990) Number of Hazardous Substance USTs by State, Age of Tank, and Tank Protection Status

State	Protected Tanks					Unprotected Tanks				
	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	> 20 years	0 - 5 years	6 - 10 years	11 - 15 years	16 - 20 years	> 20 years
Ohio	21	23	22	18	17	20	18	34	34	75
Oklahoma	2	1	1	1	1	3	9	7	5	7
Oregon	1	4	2	1	2	1	15	11	9	17
Pennsylvania	16	6	6	3	6	35	42	70	48	94
Puerto Rico	5	2	4	1	0	5	4	12	3	1
Rhode Island	2	2	2	1	1	3	4	5	4	10
South Carolina	15	26	6	6	12	6	26	6	8	18
South Dakota	0	0	0	0	0	0	2	4	1	1
Tennessee	6	1	1	1	3	8	8	11	12	28
Texas	11	31	29	11	25	11	72	84	32	92
Utah	3	1	0	0	1	2	5	1	1	9
Vermont	1	2	0	2	0	0	1	0	1	0
Virgin Islands	0	0	0	0	0	0	0	0	0	0
Virginia	20	5	5	2	5	38	58	58	32	83
Washington	4	3	7	3	12	4	8	20	10	43
West Virginia	1	1	1	1	2	3	4	3	5	1
Wisconsin	13	14	13	18	16	13	31	38	55	58
Wyoming	3	1	0	0	0	4	3	0	2	1
Totals	486	519	520	327	943	512	1056	1245	1161	4094

After tank protection is determined, the tanks are advanced to the next age category and regrouped into protected and unprotected tanks.

The assumptions used in this aging process are presented in Appendix A of the report by Bueckman *et al.* and are reproduced here as Exhibit 4-2. The exhibit shows the portion of existing protected and unprotected tanks of various ages that will be subject to one of the available actions during certain time periods. For example, the exhibit shows that of all unprotected tanks age 0 to 5 years during the period from 1990 to 1994, 60 percent will remain open, 7.5 percent will close, 2.5 percent will be replaced, and 30 percent will be protected during that period. (See Bueckman et al. report for an explanation of how these percentages were derived.)

Accepting this algorithm results in the following assumptions and constraints: tanks containing hazardous substances will behave (perform, age and degrade) like tanks containing petroleum, new tanks age 0-5 years are limited to replacements, "no significant growth in the demand for USTs is anticipated over the time period covered in this estimation" (Bueckman *et al.*, p. 29), the majority (96 percent) of all closures will occur between 1990 and 1999 based on the assumption of compliance with existing regulations (Ibid., p. 27), and 30 percent of all unprotected USTs will have been upgraded or replaced after five years.[8] (Ibid., p. 25) As noted earlier in this section, the UST regulations require that all USTs be protected and have secondary containment by the end of 1998 and, therefore, the model assumes that no unprotected tanks will exist after 1998.

4.3.2 The Percentage of USTs with Releases

To project the percentage of hazardous substance USTs with releases in each time period for each State, EPA adopted the release rates and approach used by Bueckman *et al* for unprotected tanks. They assumed that age will affect the probability of tank failure and that "a release can occur from a spill, an overfill or a leak and may be above or below the ground." (p. 37)

The release rates for unprotected tanks by age cohort and protection status are shown in Exhibit 4-3. These factors represent the Bueckman report authors' synthesis of information from a variety of sources, with particular emphasis given to tank testing information and cause of release

Exhibit 4-2
Assumptions Used in Aging the UST Population
(Portion of USTs)

Unprotected Tank Age (years)	Remain Open	Close	Replace	Add Protection
0-5	0.60	0.075	0.025	0.30
6-10	0.60	0.075	0.025	0.30
11-15	0.60	0.10	0.15	0.15

[8] The speed with which any action is taken over time is controlled by the figures presented in Exhibit 4-4. If new data suggest that the rate of upgrading or replacing unprotected tanks will be greater than 30 percent during the period from 1990 through 1995, this can be reflected in the model by changing the appropriate aging algorithm parameter.

Unprotected Tank Age (years)	Remain Open	Close	Replace	Add Protection
16-20	0.60	0.10	0.25	0.05
>20 or unknown	0.00	0.40	0.60	0.00
Unprotected USTs, 1995-1999				
0-5	0.00	0.00	0.00	0.00
6-10	0.00	0.10	0.20	0.70
11-15	0.00	0.20	0.50	0.30
16-20	0.00	0.25	0.70	0.05
>20 or unknown	0.00	0.30	0.70	0.00

Remain Open -- Active or inactive tank, registered status is "open."
Close -- Formal closure procedure, services of the UST are not replaced.
Replace -- Services of an UST that was closed are reopened with a new tank system on the same site or elsewhere.
Add Protection -- An unprotected UST may be upgraded or retrofitted to obtain protected status.

information.[9] Weighting these release rates by the percentage of tanks found in the applicable age status cohorts for a particular time period produces a set of weighted release factors that are then applied to the total number of tanks in that time period in each State. The result is the number of USTs within each age group in each State that have releases in the particular time period. These numbers are then summed to yield the total number of USTs with releases in the time period.

For protected tanks, EPA used an approach to account for the added protection provided by secondary containment,[10] which according to Bueckman *et al.* "may reduce release rates to virtually zero." (p. 104) The hazardous substance UST protection standards require secondary containment systems that will (1) contain released regulated substances until they are detected and removed, and (2) prevent the release of regulated substances to the environment at any time during the operational lives of those systems.[11] Under these conditions, the probability should be close to zero that a release from a protected hazardous substance UST system would contaminate soil or groundwater. All hazardous substance USTs must comply with these standards by December 22, 1998. Therefore, for purposes of estimating generation of hazardous waste from hazardous substance UST cleanups, the

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[9] See, for example, EPA 1987a, EPA 1987b; and the discussion in Bueckman *et al.*, pp. 37-40.

[10] In the preamble to EPA's proposed technical standards for USTs, secondary containment was defined as "a system installed around an UST that is designed to prevent a release from migrating beyond the secondary containment system outer wall (in the case of a double-walled tank system) or excavation area (in the case of a liner or vault system) before the release can be detected. Such a system may include, but is not limited to, impervious liners (both natural and synthetic), double-walls or vaults." (52 *Federal Register* 12772, April 17, 1987)

[11] 40 CFR 280.42(b). According to 40 CFR 280.12, "UST system" is defined to include the underground storage tank, connected underground piping, underground ancillary equipment, and any containment system.

current methodology assumes that no hazardous substance UST systems will have releases beginning in 1999.

Exhibit 4-3
Release Rates for Unprotected Hazardous Substance USTs
Over Five-Year Projection Period

Age Cohort (tank age in years)	Release Rate (% of all tanks)
0-5	0.5
6-10	0.5
11-15	5.0
16-20	10.0
>20	25.0

Source: Bueckman *et al.*, p. 39.

4.3.3 Volume of Hazardous Waste Generated and Managed Off Site

Capacity assurance planning requires projecting the volume of hazardous waste (e.g., contaminated soil) requiring off-site (i.e., commercial) treatment and disposal. The methodology assumes an average of 150 cubic yards of contaminated soil excavated and managed off-site per leaking tank. This estimate relies on data from estimates for petroleum USTs. First, using data from the Bueckman report, a weighted average of 280 cubic yards was estimated to be remediated and managed off site per release site. Applying a tanks releasing-per-site conversion factor weighted by the number of tanks in each age and protection status category and their release rates to this volume, approximately 150 cubic yards of soil was estimated to be excavated and managed off site per release. [12]

[12] See Bueckman *et al*. Using data from the EPA Computerized On Line Information System and best engineering judgement, the Bueckman report calculated tanks-per-site conversion factors for each age and protection status of tanks. We weighted these factors according to the baseyear (1990) population of tanks and projected release rates to develop a tanks releasing-per-site conversion factor. Specifically, the Agency multiplied the number of unprotected tanks in each age category in the baseyear by their respective release rates to determine the total number of releases projected in each category (tanks x releases/tank = releases). Then the Agency multiplied the number of releases in each category by the releases per contaminated site factor from Bueckman *et al*, added the results for all age categories, and divided the sum by the total number of releases for all categories ((releases x releases/site)/releases = releases/site). The resulting factor, approximately 1.9, represents the average number of tanks releasing at a contaminated site. This number is relatively high because a large fraction of releases are at old sites where more than one tank has had a release.

4.3.4 Allocation of Wastes to CAP Management Categories

EPA predicted the practices that would be used for managing hazardous waste generated from UST cleanups based on information provided in the Office of Research and Development's report. (EPA 1991) Based on that report, excavated waste will be contaminated predominately with organic solvents. Organic compounds (including solvents and monomers) were stored in 81 percent of the tanks that contained hazardous substances. Of that 81 percent, 60 percent is accounted for by five common solvents: acetone, toluene, methanol, xylene, and methyl ethyl ketone. (EPA 1991, pp. 13-14) Using this information and the knowledge that contaminated soil would likely be contaminated with only one constituent,[13] EPA predicts the following breakdown of waste management practices:

• Incineration and landfill	80%
• Incineration followed by stabilization and landfill	10%
• Stabilization and landfill	10%
	100%

This approach assumes that the residuals of incineration and stabilization are managed in RCRA Subtitle C landfills. The rationale for this approach is that the vast majority of one-time hazardous wastes from hazardous substance UST cleanups are likely to be RCRA listed wastes, residuals of which are hazardous wastes under the derived from rule (40 CFR 261.3(c)(2)(i)). (Treatment residuals of characteristic wastes, on the other hand, are not hazardous wastes if they no longer exhibit a characteristic of a hazardous waste.) EPA believes that wastes from hazardous substance UST cleanups are listed wastes because USTs contain commercial chemical products, which are most likely to bear P or U listed hazardous waste codes (e.g., off-specification, discarded, or spilled products) under the RCRA waste identification system. (EPA 1991)

EPA recognizes that these assumptions, because they do not allow for increasing use of recovery technologies or on-site remediation technologies, may overstate future demand for RCRA hazardous waste treatment and disposal capacity. EPA has identified a growing trend towards greater use of on-site treatment technologies such as soil vapor extraction (SVE) and bioremediation for soil contaminated with hazardous substances, particularly volatile organic compounds. Also, EPA's Office of Underground Storage Tanks has been undertaking a campaign to encourage and greatly increase the use of on-site technologies at UST cleanups wherever feasible with the specific goals of decreasing the costs of cleanups and reducing the amount of contaminated material that must be disposed of off site. In fact, new technologies, primarily used on site, might substantially reduce the need for off-site treatment in the future.

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[13] Most UST cleanups will address a release from a single tank, where multiple tanks have leaked; they are likely to have contained the same chemical product.

4.4 REFERENCES

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5. STATE AND PRIVATE CLEANUPS

5.1 INTRODUCTION

This chapter presents the methodology EPA used to estimate the total amount of one-time hazardous waste generated from State and private cleanups for the years 1992 through 2013 on a State-by-State basis. State and private cleanups are site remediation activities that are conducted and overseen by State and local agencies and private firms, excluding Superfund remedial and removal actions, RCRA Subtitle C corrective actions, and UST cleanups.

5.2 DATA SOURCES

EPA used the following three data sources for estimating one-time waste volumes from State and private cleanups:

(1) EPA Superfund remedial action waste estimates from Chapter 1;

(2) EPA RCRA corrective action waste estimates from Chapter 3;

(3) Preliminary EPA projections of the national volumes of contaminated media generated annually that were prepared in support of the development of a the not-as-yet proposed Hazardous Waste Identification Rule (HWIR). (See ICF 1992a, ICF 1992b, ICF 1992c, and ICF 1993b.)

The first two sources, Chapters 1 and 3 of this report, contain EPA's one-time waste projection methodologies and results for Superfund remedial action and RCRA corrective action waste estimates. The State and private cleanup methodology also uses these estimates in conjunction with a ratio of State and private cleanup volumes relative to Superfund remedial action and RCRA corrective action volumes that were developed from EPA analyses for HWIR. These analyses included the use of the decision science technique of expert judgment elicitation to estimate the volumes of contaminated media generated annually, including national-level estimates for State and private cleanups, Superfund remedial actions, and RCRA corrective actions.[14]

5.3 METHODOLOGY

The methodology for estimating one-time waste volumes from State and private cleanups consists of three steps.

5.3.1 Identify Ratio of Cleanup Volumes

As part of an analysis to predict the quantities of contaminated media potentially affected by HWIR, EPA projected the annual generation of contaminated soil from Superfund remedial actions,

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[14] See Spetzler, C.S. and Stael Von Holstein, C.-A.S., "Probability Encoding in Decision Analysis," *Management Science*, Vol. 22, No. 3.; Stael Von Holstein, C.-A.S. and Matheson, J.E., *A Manual for Encoding Probability Distributions*, SRI International, Palo Alto, CA., 1979; and Morgan, M.G. and Henrion, M., *Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis*, Cambridge University Press, 1990.

RCRA corrective actions, RCRA closures, State Superfund, and voluntary cleanups. These estimates show that the volume of waste from State and private cleanups is equal to approximately 11 percent of the volume of waste from Superfund remedial actions and RCRA corrective actions. The remainder of this section describes the process that EPA used to develop the preliminary national volume estimates from which the ratio was derived.

EPA used a two-part process to develop the national volume estimates. First, EPA reviewed available data sources to develop initial estimates of contaminated media volumes. Secondly, EPA conducted structured interviews, using expert judgment elicitation and, a decision science technique, to revise the initial estimates.

Calculate Initial Waste Volumes

To calculate initial waste volumes for several sources of contaminated media and for each type of cleanup, EPA developed the following key parameters:

- Number of sites nationwide;
- Percentage of sites with contaminated media;
- Pace of remediation;
- Average volume of contaminated media per site; and
- Portion of the volume excavated.

For each type of remediation, EPA derived initial estimates for each parameter from review of various data sources. For example:

- **CERCLA Remedial Actions.** Estimates of the total volume of soil from CERCLA sites were based primarily on Records of Decision (RODs) from 1989, 1990, and 1991. The total number of CERCLA sites was estimated using the Comprehensive Environmental Response, Compensation, and Liability Inventory System (CERCLIS). The percentage of sites with contaminated soil was based on a review of ROD abstracts in the *1990 ROD Annual Report* (EPA 1991).

- **RCRA Corrective Actions.** Estimates of the percentage of facilities with contaminated soil, percentage of facilities excavated, and average quantity excavated were based on work for the regulatory impact analysis (RIA) for the final Subtitle C corrective action rules (ICF 1992c). The value for number of RCRA facilities was estimated from the Resource Conservation and Recovery Inventory System (RCRIS).

- **State Superfund and Private Cleanups.** Finally, the total number of State Superfund and voluntary cleanup sites was estimated using *State and Private Sector Cleanups* (Day, S.M. *et al*) and professional judgment was used to estimate values for the other parameters.

Expert Elicitation

Expert elicitation was used to revise the initial estimates on the quantities of contaminated soil.[15] For each remediation category, EPA identified individuals with expertise in the various remediation categories. These experts were asked to review the initial estimates of contaminated volumes and provide their own estimates and associated confidence intervals for each of the parameters used to construct the estimate. In those cases where the expert disagreed with the initial estimates, EPA substituted the expert's judgments for the original figures. When the expert agreed with or had no basis to modify the initial estimates, EPA retained the original figures.

The experts' responses were usually given in terms of subjective probability distributions. Experts were asked to provide high, low, and mean estimates. EPA interviewers then asked the experts to judge the percent chance that the actual number would fall above or below the estimate. For example, an expert might estimate a low value with a 10 percent chance that the actual number would fall below the estimate and a high value with a 10 percent chance that the actual number would fall above the estimate. These estimates and confidence intervals were used to derive a normal statistical distribution with a mean (i.e., a standard bell-shaped curve). When the expert provided only a low and a high number, EPA assumed a uniform distribution between the two extreme values. That is, the actual number was equally likely to occur at any point between the estimates, rather than at a mean. These estimates were then entered into Demos, a probabilistic modelling software, to generate and mathematically manipulate the probability distributions.

Demos generated and plotted distributions of variables that depend on other probabilistic values by taking random samples of values from each input distribution. For instance, the annual quantity of contaminated soil from a given source (e.g., Superfund remediations) is equal to the total contaminated soil generated by that source multiplied by the assumed pace of remediation. The total contaminated soil generated is a probabilistic value and the assumed pace of remediation is a given value. Demos calculated the annual quantity of contaminated soil by generating a random value from the distribution of the total contaminated soil generated and multiplying it by the assumed pace of remediation. By repeating this process 20 times, Demos generated a probability distribution for the annual quantity of contaminated soil. In this way, Demos generated cumulative distributions for each source category.

In addition, EPA's methodology includes an adjustment to account for the potential use of Corrective Action Management Units (CAMUs) at Superfund remedial action and RCRA corrective action sites. For Superfund remedial action projections, the methodology reduces the demand for off-site management by 43% for all States. This adjustment is based on past work for the RCRA corrective action RIA.

Exhibit 5-1 below presents the annual median estimates (and the corresponding percent of total soil) for each of the source categories. The estimate for corrective action is not based on the results of HWIR expert elicitation, because those results assumed the use of CAMUs. Instead, the corrective action figure of 1,700 thousand tons per year is based on EPA analysis conducted for the

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[15] See ICF Incorporated 1992a and 1992b for further detail on this approach. In addition, ICF 1993b identifies the experts who were interviewed and EPA's current plans for refining the estimates, primarily to develop five-year, instead of 20-year projections.

CAMU final rule. The results in Exhibit 5-1 are not directly comparable to the CAP projections presented in this and other chapters for two reasons:

(1) The volumes in Exhibit 5-1 represent all excavated wastes, whether they are managed onsite or offsite. In contrast, the CAP projections address wastes managed offsite only.

(2) The volumes in Exhibit 5-1 represent contaminated soil only. The CAP projections address contaminated soil and other types of one time waste (e.g., debris).

Exhibit 5-1
Annual National Volumes of Contaminated Soil Generated Projected by Preliminary HWIR Analysis

Source of Contaminated Soil	Annual Volume Generated (thousands tons)	Percent of Total
Superfund Remedial Action	900	31
RCRA Corrective Action	1700	59
State Superfund	90	3
Voluntary	190	7
Total	2880	100

As shown in the exhibit above, State and private cleanups comprise approximately 10 percent of the total volume of contaminated soil.[16] Using the data presented above, State and private cleanup waste represents 11 percent (10/90 x 100) of the combined volume of Superfund remedial action and RCRA corrective action wastes. As described below, this ratio was applied to CAP projections for Superfund remedial actions and RCRA corrective actions to project state-by-state volumes for State and private cleanups.

5.3.2 Apply Ratio to Superfund Remedial Action and RCRA Corrective Action Projections

As shown in exhibit 5-1, State and private cleanups represent 11 percent of the combined volume of Superfund remedial action and RCRA corrective action wastes. Thus, the one-time waste projection methodology for State and private cleanups multiplies the projected annual average volume for Superfund remedial actions and RCRA corrective action wastes (presented in Chapters 1 and 3 of this report) by 11 percent.

[16] This methodology assumes that the relative amounts of contaminated soil at Superfund remedial action, and State and private cleanups are the same as the relative amounts of all types of one-time wastes (e.g., contaminated soils and debris) generated at these cleanups. This simplifying assumption was used because data on one-time wastes other than contaminated soil are not available for state and private cleanups.

This method assumes that if a State has a high (low) volume of waste managed off site from Superfund remedial actions and RCRA corrective actions, it will have a high (low) amount of State and private cleanup waste managed off site. EPA believes that this assumption is reasonable for several reasons.

- A State with a relatively large volume of Superfund remedial action waste is likely to have a relatively large volume of State and private cleanup waste.

- A high volume of waste generated by Superfund and RCRA cleanups will tend to be positively correlated with the presence of certain industries that generate large volumes of hazardous waste (e.g., chemicals, manufacturing). EPA believes that the volume of waste generated by State and private cleanups is also likely to be positively correlated with these same industries.

- Under the Superfund and RCRA programs, States have some input into decisions affecting the volume of waste managed off-site, such as the choice of on-site or off-site remediation technologies. EPA believes that States are likely to be consistent in such policies between their Superfund and RCRA programs and State and private cleanup programs.

Because the methodology depends on the output of the projection approaches for two other sources of one-time waste, the estimates for State and private cleanup waste necessarily embrace all the relevant assumptions used in these other methodologies.

5.3.3 Allocate Waste Volumes to CAP Management Categories

EPA allocated State and private cleanup waste to CAP Management Categories by assuming that this waste is managed similarly to the waste from Superfund remedial actions. This approach is reasonable because State Superfund cleanups, for example, are often conducted at inactive or abandoned facilities contaminated by a variety of hazardous wastes, like federal Superfund remedial actions.

Combining this assumption and the prior step in the methodology, EPA allocated State and private cleanup waste to CAP Management Categories based on the combined Superfund remedial action and RCRA corrective action waste volumes managed in each Category in each state over the periods 1992 to 1999 and 2000 through 2013. For example, if a state incinerated an average of 1000 tons/year of Superfund remedial action and RCRA corrective action waste from 1992 to 1999, EPA assumed that the state incinerated an average of 110 (1000 x .11 tons of State and private waste over the same period.

In this calculation, EPA used state-by-state averages of the volume of Superfund remedial action waste and RCRA corrective action waste in each CAP Management Category for the projection periods from 1992 to 1999 and 2000 to 2013 to reduce the impact of the significant year-to-year fluctuations in the projected volumes of Superfund and RCRA corrective actions waste in many states. That is, annual state and private cleanup volumes in each state were summed for each CAP Management Category in each projection period and then divided by eight and 14 years respectively to derive an annual combined average volume, which was then multiplied by 11 percent.

5.4 REFERENCES

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ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

ALABAMA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	3,868	2,901
	STABILIZATION	0	0	0
	LANDFILL	0	2,358	1,768
	CUM. LANDFILL	0	14,147	38,904
SUPERFUND REMOVAL ACTION	INCINERATION	182	190	195
	STABILIZATION	424	443	455
	LANDFILL	312	326	334
	CUM. LANDFILL	624	2,577	7,258
RCRA CORRECTIVE ACTION	INCINERATION	4,712	3,142	2,693
	STABILIZATION	0	4,087	4,378
	LANDFILL	0	1,187	509
	CUM. LANDFILL	0	7,122	14,244
HAZARDOUS SUBSTANCE USTS	INCINERATION	153	74	0
	STABILIZATION	34	16	0
	LANDFILL	187	91	0
	CUM. LANDFILL	375	918	918
STATE & PRIVATE PROGRAMS	INCINERATION	700	700	608
	STABILIZATION	335	335	479
	LANDFILL	289	289	247
	CUM. LANDFILL	577	2,310	5,768
ALL SOURCES	INCINERATION	5,748	7,974	6,397
	STABILIZATION	793	4,861	5,312
	LANDFILL	788	4,250	2,858
	CUM. LANDFILL	1,576	27,075	67,093

ONE-TIME WASTE REQUIRED CAPACITY BY SOU[illegible]CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible]S)

ALASKA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	89	67
	STABILIZATION	0	89	67
	LANDFILL	0	128	96
	CUM. LANDFILL	0	768	2,111
SUPERFUND REMOVAL ACTION	INCINERATION	39	41	42
	STABILIZATION	92	96	99
	LANDFILL	68	71	73
	CUM. LANDFILL	136	560	1,578
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	11,864
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	91	47	0
	STABILIZATION	20	11	0
	LANDFILL	111	58	0
	CUM. LANDFILL	222	569	569
STATE & PRIVATE PROGRAMS	INCINERATION	7	7	7
	STABILIZATION	7	7	1,304
	LANDFILL	10	10	10
	CUM. LANDFILL	21	83	229
ALL SOURCES	INCINERATION	137	185	116
	STABILIZATION	120	203	13,334
	LANDFILL	189	267	179
	CUM. LANDFILL	378	1,981	4,487

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

AMERICAN SAMOA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	55	58	59
	STABILIZATION	129	135	138
	LANDFILL	95	99	102
	CUM. LANDFILL	190	784	2,209
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	55	58	59
	STABILIZATION	129	135	138
	LANDFILL	95	99	102
	CUM. LANDFILL	190	784	2,209

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR[illegible] CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible]S)

ARIZONA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	272	204
	LANDFILL	0	41	31
	CUM. LANDFILL	0	245	674
SUPERFUND REMOVAL ACTION	INCINERATION	118	124	127
	STABILIZATION	276	289	296
	LANDFILL	203	212	218
	CUM. LANDFILL	407	1,681	4,734
RCRA CORRECTIVE ACTION	INCINERATION	149	149	149
	STABILIZATION	1,383	1,383	1,383
	LANDFILL	138	138	138
	CUM. LANDFILL	277	1,106	3,042
HAZARDOUS SUBSTANCE USTS	INCINERATION	315	154	0
	STABILIZATION	70	34	0
	LANDFILL	385	188	0
	CUM. LANDFILL	771	1,901	1,901
STATE & PRIVATE PROGRAMS	INCINERATION	16	16	16
	STABILIZATION	173	173	173
	LANDFILL	18	18	18
	CUM. LANDFILL	37	147	406
ALL SOURCES	INCINERATION	599	443	292
	STABILIZATION	1,903	2,152	2,058
	LANDFILL	745	598	405
	CUM. LANDFILL	1,491	5,081	10,757

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

ARKANSAS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	13	412	312
	STABILIZATION	11	381	289
	LANDFILL	16	556	421
	CUM. LANDFILL	32	3,371	9,270
SUPERFUND REMOVAL ACTION	INCINERATION	111	116	119
	STABILIZATION	258	270	277
	LANDFILL	190	198	204
	CUM. LANDFILL	380	1,569	4,418
RCRA CORRECTIVE ACTION	INCINERATION	0	30,119	12,908
	STABILIZATION	0	21,234	18,201
	LANDFILL	0	539	693
	CUM. LANDFILL	0	3,235	12,941
HAZARDOUS SUBSTANCE USTS	INCINERATION	210	115	0
	STABILIZATION	47	26	0
	LANDFILL	257	141	0
	CUM. LANDFILL	514	1,360	1,360
STATE & PRIVATE PROGRAMS	INCINERATION	2,504	2,504	1,445
	STABILIZATION	1,772	1,772	2,021
	LANDFILL	90	90	121
	CUM. LANDFILL	180	719	2,418
ALL SOURCES	INCINERATION	2,838	33,265	14,784
	STABILIZATION	2,088	23,683	20,787
	LANDFILL	553	1,525	1,440
	CUM. LANDFILL	1,106	10,254	30,408

ONE-TIME WASTE: REQUIRED CAPACITY BY SOU[illegible] CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHO[illegible]S)

CALIFORNIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	2,136	8,751	7,097
	STABILIZATION	1,752	7,989	6,430
	LANDFILL	2,616	11,758	9,472
	CUM. LANDFILL	5,232	75,777	208,387
SUPERFUND REMOVAL ACTION	INCINERATION	664	693	712
	STABILIZATION	1,548	1,617	1,660
	LANDFILL	1,139	1,189	1,221
	CUM. LANDFILL	2,277	9,413	26,508
RCRA CORRECTIVE ACTION	INCINERATION	0	2,688	2,797
	STABILIZATION	23,173	30,897	43,036
	LANDFILL	1,076	2,871	2,922
	CUM. LANDFILL	2,153	19,376	60,281
HAZARDOUS SUBSTANCE USTS	INCINERATION	17,748	3,163	0
	STABILIZATION	3,944	703	0
	LANDFILL	21,691	3,866	0
	CUM. LANDFILL	43,383	66,582	66,582
STATE & PRIVATE PROGRAMS	INCINERATION	989	989	1,074
	STABILIZATION	3,863	3,863	5,401
	LANDFILL	1,290	1,290	1,345
	CUM. LANDFILL	2,580	10,321	29,147
ALL SOURCES	INCINERATION	21,535	16,284	11,680
	STABILIZATION	34,280	45,070	56,527
	LANDFILL	27,813	20,974	14,960
	CUM. LANDFILL	55,625	181,469	390,905

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

COLORADO

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	136	0	34
	STABILIZATION	136	0	34
	LANDFILL	1,879	0	470
	CUM. LANDFILL	3,758	3,758	10,333
SUPERFUND REMOVAL ACTION	INCINERATION	355	371	381
	STABILIZATION	829	866	889
	LANDFILL	610	637	654
	CUM. LANDFILL	1,220	5,043	14,201
RCRA CORRECTIVE ACTION	INCINERATION	0	208	89
	STABILIZATION	0	2,244	3,847
	LANDFILL	0	1,574	674
	CUM. LANDFILL	0	9,442	18,884
HAZARDOUS SUBSTANCE USTS	INCINERATION	645	340	0
	STABILIZATION	143	75	0
	LANDFILL	789	415	0
	CUM. LANDFILL	1,577	4,068	4,068
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	1,136	919	504
	STABILIZATION	1,108	3,186	4,770
	LANDFILL	3,277	2,626	1,798
	CUM. LANDFILL	6,555	22,310	47,485

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR[illegible]CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible])

CONNECTICUT

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	494	370
	STABILIZATION	0	430	322
	LANDFILL	0	655	492
	CUM. LANDFILL	0	3,933	10,815
SUPERFUND REMOVAL ACTION	INCINERATION	87	91	93
	STABILIZATION	203	212	217
	LANDFILL	149	156	160
	CUM. LANDFILL	298	1,233	3,471
RCRA CORRECTIVE ACTION	INCINERATION	1,114	5,568	5,250
	STABILIZATION	63	632	894
	LANDFILL	325	759	860
	CUM. LANDFILL	651	5,205	17,242
HAZARDOUS SUBSTANCE USTS	INCINERATION	732	257	0
	STABILIZATION	163	57	0
	LANDFILL	895	315	0
	CUM. LANDFILL	1,790	3,677	3,677
STATE & PRIVATE PROGRAMS	INCINERATION	527	527	614
	STABILIZATION	88	88	133
	LANDFILL	124	124	147
	CUM. LANDFILL	249	995	3,056
ALL SOURCES	INCINERATION	2,460	6,937	6,328
	STABILIZATION	517	1,419	1,566
	LANDFILL	1,494	2,009	1,658
	CUM. LANDFILL	2,987	15,042	38,261

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

DELAWARE

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	1,600	1,200
	STABILIZATION	0	1,500	1,125
	LANDFILL	0	2,350	1,762
	CUM. LANDFILL	0	14,098	38,770
SUPERFUND REMOVAL ACTION	INCINERATION	29	29	29
	STABILIZATION	67	67	67
	LANDFILL	50	50	50
	CUM. LANDFILL	100	400	1,100
RCRA CORRECTIVE ACTION	INCINERATION	0	450	0
	STABILIZATION	0	0	0
	LANDFILL	0	280	0
	CUM. LANDFILL	0	1,678	1,678
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
STATE & PRIVATE PROGRAMS	INCINERATION	10	10	10
	STABILIZATION	0	0	0
	LANDFILL	23	23	23
	CUM. LANDFILL	45	181	498
ALL SOURCES	INCINERATION	39	2,089	1,239
	STABILIZATION	67	1,567	1,192
	LANDFILL	73	2,702	1,835
	CUM. LANDFILL	145	16,357	42,045

No

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR[illegible] CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible])

DISTRICT OF COLUMBIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	51	21	0
	STABILIZATION	11	5	0
	LANDFILL	62	25	0
	CUM. LANDFILL	124	276	276
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	51	21	0
	STABILIZATION	11	5	0
	LANDFILL	62	25	0
	CUM. LANDFILL	124	276	276

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

FLORIDA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	328	10,274	7,788
	STABILIZATION	269	19,823	14,935
	LANDFILL	402	16,150	12,213
	CUM. LANDFILL	803	97,703	268,683
SUPERFUND REMOVAL ACTION	INCINERATION	411	429	440
	STABILIZATION	958	1,001	1,028
	LANDFILL	705	736	756
	CUM. LANDFILL	1,410	5,827	16,410
RCRA CORRECTIVE ACTION	INCINERATION	0	4,397	4,523
	STABILIZATION	15,884	5,295	9,077
	LANDFILL	65	87	94
	CUM. LANDFILL	131	655	1,964
HAZARDOUS SUBSTANCE USTS	INCINERATION	434	163	0
	STABILIZATION	96	36	0
	LANDFILL	530	200	0
	CUM. LANDFILL	1,060	2,258	2,258
STATE & PRIVATE PROGRAMS	INCINERATION	1,203	1,203	1,337
	STABILIZATION	2,485	2,485	2,609
	LANDFILL	1,331	1,331	1,332
	CUM. LANDFILL	2,662	10,647	29,297
ALL SOURCES	INCINERATION	2,376	16,467	14,088
	STABILIZATION	19,693	28,640	27,648
	LANDFILL	3,033	18,504	14,394
	CUM. LANDFILL	6,066	117,090	318,613

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT [illegible]

GEORGIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	1,067	800
	STABILIZATION	0	7,776	5,832
	LANDFILL	0	2,481	1,861
	CUM. LANDFILL	0	14,886	40,936
SUPERFUND REMOVAL ACTION	INCINERATION	521	545	559
	STABILIZATION	1,216	1,271	1,304
	LANDFILL	895	934	959
	CUM. LANDFILL	1,789	7,396	20,828
RCRA CORRECTIVE ACTION	INCINERATION	1,026	0	880
	STABILIZATION	0	5,371	9,207
	LANDFILL	0	775	581
	CUM. LANDFILL	0	4,650	12,789
HAZARDOUS SUBSTANCE USTS	INCINERATION	553	309	0
	STABILIZATION	123	69	0
	LANDFILL	676	377	0
	CUM. LANDFILL	1,351	3,614	3,614
STATE & PRIVATE PROGRAMS	INCINERATION	115	115	183
	STABILIZATION	1,072	1,072	1,638
	LANDFILL	265	265	265
	CUM. LANDFILL	530	2,120	5,829
ALL SOURCES	INCINERATION	2,215	2,035	2,422
	STABILIZATION	2,411	15,558	17,982
	LANDFILL	1,835	4,833	3,666
	CUM. LANDFILL	3,670	32,667	83,996

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

GUAM

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	71	74	76
	STABILIZATION	166	173	178
	LANDFILL	122	127	131
	CUM. LANDFILL	244	1,009	2,840
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	71	74	76
	STABILIZATION	166	173	178
	LANDFILL	122	127	131
	CUM. LANDFILL	244	1,009	2,840

ONE-TIME WASTE: REQUIRED CAPACITY BY SOU[illegible]CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible])

HAWAII

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	25	19
	STABILIZATION	0	0	0
	LANDFILL	0	17	12
	CUM. LANDFILL	0	99	274
SUPERFUND REMOVAL ACTION	INCINERATION	32	33	34
	STABILIZATION	74	77	79
	LANDFILL	54	57	58
	CUM. LANDFILL	108	448	1,262
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	4,249	4,734
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	69	37	0
	STABILIZATION	15	8	0
	LANDFILL	84	45	0
	CUM. LANDFILL	169	441	441
STATE & PRIVATE PROGRAMS	INCINERATION	2	2	2
	STABILIZATION	348	348	518
	LANDFILL	1	1	1
	CUM. LANDFILL	3	11	30
ALL SOURCES	INCINERATION	103	97	54
	STABILIZATION	437	4,682	5,331
	LANDFILL	140	120	72
	CUM. LANDFILL	280	999	2,006

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

IDAHO

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	677	508
	STABILIZATION	0	1,373	1,029
	LANDFILL	0	952	714
	CUM. LANDFILL	0	5,714	15,712
SUPERFUND REMOVAL ACTION	INCINERATION	111	116	119
	STABILIZATION	258	270	277
	LANDFILL	190	198	204
	CUM. LANDFILL	380	1,569	4,418
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	83	36
	CUM. LANDFILL	0	498	997
HAZARDOUS SUBSTANCE USTS	INCINERATION	267	97	0
	STABILIZATION	59	22	0
	LANDFILL	327	118	0
	CUM. LANDFILL	654	1,363	1,363
STATE & PRIVATE PROGRAMS	INCINERATION	55	55	55
	STABILIZATION	111	111	111
	LANDFILL	84	84	81
	CUM. LANDFILL	168	673	1,810
ALL SOURCES	INCINERATION	433	945	682
	STABILIZATION	429	1,775	1,418
	LANDFILL	601	1,436	1,034
	CUM. LANDFILL	1,201	9,817	24,300

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR[illegible]APS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible])

ILLINOIS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	4,084	10,085	8,585
	STABILIZATION	3,350	9,265	7,786
	LANDFILL	5,003	13,265	11,199
	CUM. LANDFILL	10,006	89,595	246,387
SUPERFUND REMOVAL ACTION	INCINERATION	340	355	364
	STABILIZATION	793	828	850
	LANDFILL	583	609	625
	CUM. LANDFILL	1,166	4,819	13,570
RCRA CORRECTIVE ACTION	INCINERATION	14,234	18,979	18,301
	STABILIZATION	102,463	119,541	102,463
	LANDFILL	1,905	2,540	2,177
	CUM. LANDFILL	3,810	19,052	49,535
HAZARDOUS SUBSTANCE USTS	INCINERATION	11,806	5,226	0
	STABILIZATION	2,624	1,161	0
	LANDFILL	14,430	6,387	0
	CUM. LANDFILL	28,860	67,183	67,183
STATE & PRIVATE PROGRAMS	INCINERATION	2,874	2,874	2,930
	STABILIZATION	13,446	13,446	12,045
	LANDFILL	1,473	1,473	1,450
	CUM. LANDFILL	2,945	11,781	32,085
ALL SOURCES	INCINERATION	33,339	37,518	30,180
	STABILIZATION	122,675	144,241	123,145
	LANDFILL	23,394	24,274	15,452
	CUM. LANDFILL	46,787	192,430	408,759

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

INDIANA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	12	1,143	860
	STABILIZATION	10	1,965	1,476
	LANDFILL	15	1,602	1,206
	CUM. LANDFILL	30	9,644	26,522
SUPERFUND REMOVAL ACTION	INCINERATION	466	487	500
	STABILIZATION	1,087	1,136	1,166
	LANDFILL	800	835	858
	CUM. LANDFILL	1,600	6,612	18,619
RCRA CORRECTIVE ACTION	INCINERATION	1,879	3,131	4,697
	STABILIZATION	0	15,541	19,981
	LANDFILL	0	1,626	1,219
	CUM. LANDFILL	0	9,755	26,825
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,368	436	0
	STABILIZATION	304	97	0
	LANDFILL	1,672	533	0
	CUM. LANDFILL	3,344	6,543	6,543
STATE & PRIVATE PROGRAMS	INCINERATION	401	401	607
	STABILIZATION	1,434	1,434	2,344
	LANDFILL	264	264	264
	CUM. LANDFILL	528	2,110	5,804
ALL SOURCES	INCINERATION	4,126	5,598	6,663
	STABILIZATION	2,835	20,172	24,967
	LANDFILL	2,750	4,861	3,546
	CUM. LANDFILL	5,500	34,664	84,313

ONE-TIME WASTE: REQUIRED CAPACITY BY SOU[illegible]APS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible])

IOWA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	48	2,247	1,697
	STABILIZATION	40	2,022	1,527
	LANDFILL	59	2,824	2,133
	CUM. LANDFILL	118	17,064	46,927
SUPERFUND REMOVAL ACTION	INCINERATION	79	83	85
	STABILIZATION	184	193	198
	LANDFILL	136	142	145
	CUM. LANDFILL	271	1,121	3,156
RCRA CORRECTIVE ACTION	INCINERATION	0	610	523
	STABILIZATION	0	11,149	19,113
	LANDFILL	0	266	171
	CUM. LANDFILL	0	1,597	3,994
HAZARDOUS SUBSTANCE USTS	INCINERATION	659	319	0
	STABILIZATION	146	71	0
	LANDFILL	805	390	0
	CUM. LANDFILL	1,610	3,949	3,949
STATE & PRIVATE PROGRAMS	INCINERATION	234	234	241
	STABILIZATION	1,080	1,080	2,255
	LANDFILL	253	253	250
	CUM. LANDFILL	505	2,022	5,516
ALL SOURCES	INCINERATION	1,020	3,492	2,546
	STABILIZATION	1,450	14,515	23,093
	LANDFILL	1,253	3,875	2,699
	CUM. LANDFILL	2,505	25,753	63,542

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

KANSAS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	533	400
	STABILIZATION	0	484	363
	LANDFILL	0	730	548
	CUM. LANDFILL	0	4,381	12,047
SUPERFUND REMOVAL ACTION	INCINERATION	118	124	127
	STABILIZATION	276	289	296
	LANDFILL	203	212	218
	CUM. LANDFILL	407	1,681	4,734
RCRA CORRECTIVE ACTION	INCINERATION	0	0	10,779
	STABILIZATION	0	28,793	21,595
	LANDFILL	0	1,136	487
	CUM. LANDFILL	0	6,813	13,626
HAZARDOUS SUBSTANCE USTS	INCINERATION	166	42	0
	STABILIZATION	37	9	0
	LANDFILL	203	51	0
	CUM. LANDFILL	405	710	710
STATE & PRIVATE PROGRAMS	INCINERATION	43	43	1,222
	STABILIZATION	2,400	2,400	2,400
	LANDFILL	152	152	112
	CUM. LANDFILL	305	1,219	2,794
ALL SOURCES	INCINERATION	327	742	12,528
	STABILIZATION	2,714	31,976	24,655
	LANDFILL	558	2,281	1,365
	CUM. LANDFILL	1,116	14,804	33,911

ONE-TIME WASTE: REQUIRED CAPACITY BY SO[illegible] CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHO[illegible]NS)

KENTUCKY

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	937	703
	STABILIZATION	0	1,728	1,296
	LANDFILL	0	1,440	1,080
	CUM. LANDFILL	0	8,641	23,763
SUPERFUND REMOVAL ACTION	INCINERATION	308	322	330
	STABILIZATION	719	751	771
	LANDFILL	529	552	567
	CUM. LANDFILL	1,057	4,371	12,307
RCRA CORRECTIVE ACTION	INCINERATION	1,372	457	686
	STABILIZATION	0	12,805	5,488
	LANDFILL	0	0	584
	CUM. LANDFILL	0	0	8,176
HAZARDOUS SUBSTANCE USTS	INCINERATION	187	32	0
	STABILIZATION	42	7	0
	LANDFILL	229	39	0
	CUM. LANDFILL	457	689	689
STATE & PRIVATE PROGRAMS	INCINERATION	151	151	151
	STABILIZATION	1,190	1,190	740
	LANDFILL	117	117	181
	CUM. LANDFILL	234	935	3,466
ALL SOURCES	INCINERATION	2,018	1,899	1,870
	STABILIZATION	1,951	16,481	8,295
	LANDFILL	874	2,148	2,412
	CUM. LANDFILL	1,748	14,636	48,401

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

LOUISIANA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	291	219
	STABILIZATION	0	787	590
	LANDFILL	0	463	348
	CUM. LANDFILL	0	2,780	7,645
SUPERFUND REMOVAL ACTION	INCINERATION	150	157	161
	STABILIZATION	350	366	376
	LANDFILL	258	269	276
	CUM. LANDFILL	515	2,129	5,996
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	11,949	0	13,656
	LANDFILL	0	2,380	1,530
	CUM. LANDFILL	0	14,279	35,697
HAZARDOUS SUBSTANCE USTS	INCINERATION	33	0	0
	STABILIZATION	7	0	0
	LANDFILL	40	0	0
	CUM. LANDFILL	81	81	81
STATE & PRIVATE PROGRAMS	INCINERATION	24	24	24
	STABILIZATION	390	390	1,557
	LANDFILL	233	233	205
	CUM. LANDFILL	466	1,862	4,730
ALL SOURCES	INCINERATION	207	472	403
	STABILIZATION	12,697	1,543	16,178
	LANDFILL	531	3,345	2,358
	CUM. LANDFILL	1,062	21,131	54,150

ONE-TIME WASTE: REQUIRED CAPACITY BY SOU[illegible] CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHO[illegible]S)

MAINE

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	124	489	397
	STABILIZATION	102	401	326
	LANDFILL	152	599	487
	CUM. LANDFILL	304	3,895	10,712
SUPERFUND REMOVAL ACTION	INCINERATION	79	83	85
	STABILIZATION	184	193	198
	LANDFILL	136	142	145
	CUM. LANDFILL	271	1,121	3,156
RCRA CORRECTIVE ACTION	INCINERATION	0	0	708
	STABILIZATION	0	363	2,073
	LANDFILL	0	882	504
	CUM. LANDFILL	0	5,293	12,351
HAZARDOUS SUBSTANCE USTS	INCINERATION	10	0	0
	STABILIZATION	2	0	0
	LANDFILL	12	0	0
	CUM. LANDFILL	25	25	25
STATE & PRIVATE PROGRAMS	INCINERATION	43	43	120
	STABILIZATION	65	65	262
	LANDFILL	125	125	108
	CUM. LANDFILL	250	1,000	2,510
ALL SOURCES	INCINERATION	256	614	1,311
	STABILIZATION	353	1,021	2,858
	LANDFILL	425	1,747	1,244
	CUM. LANDFILL	850	11,334	28,753

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

MARIANA ISLANDS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	99	103	106
	STABILIZATION	230	241	247
	LANDFILL	169	177	182
	CUM. LANDFILL	678	2,802	7,889
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	99	103	106
	STABILIZATION	230	241	247
	LANDFILL	169	177	182
	CUM. LANDFILL	678	2,802	7,889

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR[illegible]CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHOR[illegible])

MARYLAND

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	16,154	534	4,439
	STABILIZATION	13,250	484	3,675
	LANDFILL	19,787	730	5,495
	CUM. LANDFILL	39,575	43,956	120,879
SUPERFUND REMOVAL ACTION	INCINERATION	190	198	203
	STABILIZATION	442	462	474
	LANDFILL	325	340	349
	CUM. LANDFILL	651	2,690	7,574
RCRA CORRECTIVE ACTION	INCINERATION	0	852	730
	STABILIZATION	0	1,048	1,347
	LANDFILL	0	350	300
	CUM. LANDFILL	0	2,101	6,302
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,398	573	0
	STABILIZATION	311	127	0
	LANDFILL	1,709	701	0
	CUM. LANDFILL	3,418	7,623	7,623
STATE & PRIVATE PROGRAMS	INCINERATION	550	550	560
	STABILIZATION	484	484	545
	LANDFILL	623	623	628
	CUM. LANDFILL	1,247	4,987	13,773
ALL SOURCES	INCINERATION	18,292	2,707	5,932
	STABILIZATION	14,487	2,605	6,042
	LANDFILL	22,445	2,744	6,771
	CUM. LANDFILL	44,891	61,357	156,151

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

MASSACHUSETTS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	2,361	1,024	1,358
	STABILIZATION	1,937	837	1,112
	LANDFILL	2,892	1,287	1,688
	CUM. LANDFILL	5,785	13,506	37,141
SUPERFUND REMOVAL ACTION	INCINERATION	458	479	491
	STABILIZATION	1,069	1,117	1,146
	LANDFILL	786	821	843
	CUM. LANDFILL	1,572	6,500	18,303
RCRA CORRECTIVE ACTION	INCINERATION	1,111	1,852	2,222
	STABILIZATION	7,300	9,734	10,951
	LANDFILL	1,545	1,287	1,876
	CUM. LANDFILL	3,090	10,815	37,079
HAZARDOUS SUBSTANCE USTS	INCINERATION	190	85	0
	STABILIZATION	42	19	0
	LANDFILL	232	104	0
	CUM. LANDFILL	465	1,091	1,091
STATE & PRIVATE PROGRAMS	INCINERATION	329	329	390
	STABILIZATION	1,118	1,118	1,318
	LANDFILL	331	331	388
	CUM. LANDFILL	661	2,644	8,074
ALL SOURCES	INCINERATION	4,450	3,769	4,462
	STABILIZATION	11,466	12,824	14,526
	LANDFILL	5,786	3,830	4,795
	CUM. LANDFILL	11,573	34,555	101,688

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

MINNESOTA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	542	407
	STABILIZATION	0	92	69
	LANDFILL	0	588	441
	CUM. LANDFILL	0	3,530	9,706
SUPERFUND REMOVAL ACTION	INCINERATION	103	107	110
	STABILIZATION	240	250	257
	LANDFILL	176	184	189
	CUM. LANDFILL	352	1,457	4,102
RCRA CORRECTIVE ACTION	INCINERATION	0	0	815
	STABILIZATION	0	0	0
	LANDFILL	0	433	186
	CUM. LANDFILL	0	2,601	5,202
HAZARDOUS SUBSTANCE USTS	INCINERATION	219	82	0
	STABILIZATION	49	18	0
	LANDFILL	267	100	0
	CUM. LANDFILL	534	1,136	1,136
STATE & PRIVATE PROGRAMS	INCINERATION	44	44	133
	STABILIZATION	7	7	7
	LANDFILL	83	83	68
	CUM. LANDFILL	167	666	1,619
ALL SOURCES	INCINERATION	365	776	1,465
	STABILIZATION	296	368	334
	LANDFILL	527	1,389	884
	CUM. LANDFILL	1,053	9,390	21,766

ONE-TIME WASTE: REQUIRED CAPACITY BY SOUR APS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT)

MISSISSIPPI

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	4,611	1,537	2,306
	STABILIZATION	3,782	1,261	1,891
	LANDFILL	5,648	1,883	2,824
	CUM. LANDFILL	11,297	22,593	62,131
SUPERFUND REMOVAL ACTION	INCINERATION	229	239	246
	STABILIZATION	534	558	573
	LANDFILL	393	411	422
	CUM. LANDFILL	786	3,250	9,152
RCRA CORRECTIVE ACTION	INCINERATION	0	3,582	4,222
	STABILIZATION	0	15,867	6,800
	LANDFILL	0	64	27
	CUM. LANDFILL	0	384	769
HAZARDOUS SUBSTANCE USTS	INCINERATION	709	374	0
	STABILIZATION	158	83	0
	LANDFILL	867	457	0
	CUM. LANDFILL	1,734	4,473	4,473
STATE & PRIVATE PROGRAMS	INCINERATION	543	543	711
	STABILIZATION	1,506	1,506	948
	LANDFILL	311	311	309
	CUM. LANDFILL	622	2,488	6,809
ALL SOURCES	INCINERATION	6,093	6,275	7,484
	STABILIZATION	5,980	19,275	10,213
	LANDFILL	7,219	3,125	3,582
	CUM. LANDFILL	14,439	33,188	83,334

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

MISSOURI

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	5,200	216	1,462
	STABILIZATION	4,265	1,225	1,985
	LANDFILL	6,369	400	1,892
	CUM. LANDFILL	12,739	15,139	41,632
SUPERFUND REMOVAL ACTION	INCINERATION	545	569	584
	STABILIZATION	1,272	1,328	1,364
	LANDFILL	935	977	1,003
	CUM. LANDFILL	1,871	7,732	21,774
RCRA CORRECTIVE ACTION	INCINERATION	0	223	287
	STABILIZATION	0	9,801	16,801
	LANDFILL	492	0	70
	CUM. LANDFILL	984	984	1,968
HAZARDOUS SUBSTANCE USTS	INCINERATION	982	453	0
	STABILIZATION	218	101	0
	LANDFILL	1,200	554	0
	CUM. LANDFILL	2,401	5,726	5,726
STATE & PRIVATE PROGRAMS	INCINERATION	176	176	190
	STABILIZATION	1,019	1,019	2,052
	LANDFILL	218	218	213
	CUM. LANDFILL	437	1,746	4,721
ALL SOURCES	INCINERATION	6,903	1,638	2,522
	STABILIZATION	6,773	13,474	22,202
	LANDFILL	9,215	2,150	3,178
	CUM. LANDFILL	18,431	31,328	75,822

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE [illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT [illegible]

MONTANA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	200	150
	STABILIZATION	0	0	0
	LANDFILL	0	134	100
	CUM. LANDFILL	0	803	2,207
SUPERFUND REMOVAL ACTION	INCINERATION	87	91	93
	STABILIZATION	203	212	217
	LANDFILL	149	156	160
	CUM. LANDFILL	298	1,233	3,471
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	124	53
	CUM. LANDFILL	0	743	1,485
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	2	5
STATE & PRIVATE PROGRAMS	INCINERATION	311	311	311
	STABILIZATION	622	622	622
	LANDFILL	311	311	311
	CUM. LANDFILL	622	2,490	6,846
ALL SOURCES	INCINERATION	398	602	554
	STABILIZATION	825	834	840
	LANDFILL	461	725	625
	CUM. LANDFILL	921	5,269	14,015

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

NEBRASKA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	49	37
	STABILIZATION	0	0	0
	LANDFILL	0	33	25
	CUM. LANDFILL	0	199	547
SUPERFUND REMOVAL ACTION	INCINERATION	111	116	119
	STABILIZATION	258	270	277
	LANDFILL	190	198	204
	CUM. LANDFILL	380	1,569	4,418
RCRA CORRECTIVE ACTION	INCINERATION	0	0	113
	STABILIZATION	0	26,480	11,349
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	188	73	0
	STABILIZATION	42	16	0
	LANDFILL	229	89	0
	CUM. LANDFILL	458	992	992
STATE & PRIVATE PROGRAMS	INCINERATION	4	4	16
	STABILIZATION	2,171	2,171	1,241
	LANDFILL	3	3	3
	CUM. LANDFILL	5	22	59
ALL SOURCES	INCINERATION	302	242	286
	STABILIZATION	2,471	28,937	12,866
	LANDFILL	422	323	231
	CUM. LANDFILL	843	2,782	6,017

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]APS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

NEVADA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	55	58	59
	STABILIZATION	129	135	138
	LANDFILL	95	99	102
	CUM. LANDFILL	190	784	2,209
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	68	29	0
	STABILIZATION	15	7	0
	LANDFILL	83	36	0
	CUM. LANDFILL	166	380	380
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	123	87	59
	STABILIZATION	144	141	138
	LANDFILL	178	135	102
	CUM. LANDFILL	355	1,165	2,589

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR (SHORT TONS)

NEW HAMPSHIRE

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	1,849	1,387
	STABILIZATION	2	2,795	2,097
	LANDFILL	2	4,192	3,145
	CUM. LANDFILL	5	25,158	69,185
SUPERFUND REMOVAL ACTION	INCINERATION	355	371	381
	STABILIZATION	829	866	889
	LANDFILL	610	637	654
	CUM. LANDFILL	1,220	5,043	14,201
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS.	INCINERATION	463	240	0
	STABILIZATION	103	53	0
	LANDFILL	566	294	0
	CUM. LANDFILL	1,132	2,895	2,895
STATE & PRIVATE PROGRAMS	INCINERATION	150	150	150
	STABILIZATION	227	227	227
	LANDFILL	340	340	340
	CUM. LANDFILL	681	2,723	7,489
ALL SOURCES	INCINERATION	969	2,611	1,918
	STABILIZATION	1,161	3,941	3,213
	LANDFILL	1,519	5,464	4,139
	CUM. LANDFILL	3,037	35,819	93,769

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

NEW JERSEY

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	8,444	11,170	10,488
	STABILIZATION	6,926	7,745	7,540
	LANDFILL	10,343	12,427	11,906
	CUM. LANDFILL	20,686	95,250	261,939
SUPERFUND REMOVAL ACTION	INCINERATION	758	792	813
	STABILIZATION	1,769	1,848	1,897
	LANDFILL	1,301	1,359	1,395
	CUM. LANDFILL	2,603	10,758	30,295
RCRA CORRECTIVE ACTION	INCINERATION	2,730	6,371	6,046
	STABILIZATION	6,980	25,593	22,934
	LANDFILL	884	884	1,263
	CUM. LANDFILL	1,768	7,071	24,747
HAZARDOUS SUBSTANCE USTS	INCINERATION	2,565	1,158	0
	STABILIZATION	570	257	0
	LANDFILL	3,135	1,415	0
	CUM. LANDFILL	6,269	14,761	14,761
STATE & PRIVATE PROGRAMS	INCINERATION	1,732	1,732	1,796
	STABILIZATION	3,106	3,106	3,324
	LANDFILL	1,385	1,385	1,427
	CUM. LANDFILL	2,771	11,083	31,058
ALL SOURCES	INCINERATION	16,229	21,223	19,144
	STABILIZATION	19,351	38,549	35,695
	LANDFILL	17,048	17,471	15,991
	CUM. LANDFILL	34,097	138,924	362,800

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

NEW MEXICO

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	341	255
	LANDFILL	0	511	383
	CUM. LANDFILL	0	3,065	8,427
SUPERFUND REMOVAL ACTION	INCINERATION	63	66	68
	STABILIZATION	147	154	158
	LANDFILL	108	113	116
	CUM. LANDFILL	217	897	2,525
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	80	42	0
	STABILIZATION	18	9	0
	LANDFILL	98	51	0
	CUM. LANDFILL	196	502	502
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	28	28	28
	LANDFILL	41	41	41
	CUM. LANDFILL	83	332	912
ALL SOURCES	INCINERATION	143	108	68
	STABILIZATION	193	531	441
	LANDFILL	248	716	541
	CUM. LANDFILL	496	4,794	12,366

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, [illegible]S MANAGEMENT CATEGORY, AND BY YEAR
(SHORT T[illegible]

NEW YORK

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	1,447	18,105	13,941
	STABILIZATION	1,187	14,797	11,395
	LANDFILL	1,773	22,502	17,320
	CUM. LANDFILL	3,545	138,556	381,030
SUPERFUND REMOVAL ACTION	INCINERATION	900	941	966
	STABILIZATION	2,101	2,195	2,253
	LANDFILL	1,545	1,614	1,657
	CUM. LANDFILL	3,091	12,775	35,975
RCRA CORRECTIVE ACTION	INCINERATION	0	1,895	1,489
	STABILIZATION	0	11,673	13,757
	LANDFILL	0	1,303	1,117
	CUM. LANDFILL	0	7,819	23,457
HAZARDOUS SUBSTANCE USTS	INCINERATION	5,690	2,528	0
	STABILIZATION	1,264	562	0
	LANDFILL	6,954	3,090	0
	CUM. LANDFILL	13,909	32,449	32,449
STATE & PRIVATE PROGRAMS	INCINERATION	1,664	1,664	1,672
	STABILIZATION	2,191	2,191	2,737
	LANDFILL	1,982	1,982	1,997
	CUM. LANDFILL	3,963	15,852	43,807
ALL SOURCES	INCINERATION	9,702	25,134	18,067
	STABILIZATION	6,743	31,417	30,142
	LANDFILL	12,254	30,491	22,090
	CUM. LANDFILL	24,508	207,452	516,719

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

NORTH CAROLINA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	7,487	5,615
	STABILIZATION	0	7,271	5,453
	LANDFILL	0	10,604	7,953
	CUM. LANDFILL	0	63,624	174,965
SUPERFUND REMOVAL ACTION	INCINERATION	585	611	627
	STABILIZATION	1,364	1,425	1,463
	LANDFILL	1,003	1,048	1,076
	CUM. LANDFILL	2,006	8,293	23,352
RCRA CORRECTIVE ACTION	INCINERATION	0	611	327
	STABILIZATION	0	0	942
	LANDFILL	72	24	72
	CUM. LANDFILL	145	290	1,303
HAZARDOUS SUBSTANCE USTS	INCINERATION	2,027	941	0
	STABILIZATION	450	209	0
	LANDFILL	2,478	1,150	0
	CUM. LANDFILL	4,955	11,856	11,856
STATE & PRIVATE PROGRAMS	INCINERATION	658	658	644
	STABILIZATION	590	590	693
	LANDFILL	865	865	869
	CUM. LANDFILL	1,730	6,918	19,081
ALL SOURCES	INCINERATION	3,270	10,308	7,213
	STABILIZATION	2,405	9,495	8,552
	LANDFILL	4,418	13,691	9,970
	CUM. LANDFILL	8,836	90,981	230,557

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

NORTH DAKOTA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	370	277
	STABILIZATION	0	370	277
	LANDFILL	0	533	399
	CUM. LANDFILL	0	3,196	8,788
SUPERFUND REMOVAL ACTION	INCINERATION	32	33	34
	STABILIZATION	74	77	79
	LANDFILL	54	57	58
	CUM. LANDFILL	108	448	1,262
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	3,531	1,513
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	5	3	0
	STABILIZATION	1	1	0
	LANDFILL	6	4	0
	CUM. LANDFILL	12	35	35
STATE & PRIVATE PROGRAMS	INCINERATION	30	30	30
	STABILIZATION	320	320	195
	LANDFILL	43	43	43
	CUM. LANDFILL	86	346	951
ALL SOURCES	INCINERATION	67	436	341
	STABILIZATION	394	4,298	2,065
	LANDFILL	103	636	501
	CUM. LANDFILL	207	4,025	11,037

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

OHIO

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	3,422	2,211	2,514
	STABILIZATION	2,807	2,018	2,215
	LANDFILL	4,191	2,771	3,126
	CUM. LANDFILL	8,383	25,011	68,779
SUPERFUND REMOVAL ACTION	INCINERATION	474	495	508
	STABILIZATION	1,106	1,155	1,186
	LANDFILL	813	850	872
	CUM. LANDFILL	1,627	6,724	18,934
RCRA CORRECTIVE ACTION	INCINERATION	0	4,751	6,922
	STABILIZATION	0	38,509	24,756
	LANDFILL	530	1,679	1,742
	CUM. LANDFILL	1,060	11,133	35,518
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,147	490	0
	STABILIZATION	255	109	0
	LANDFILL	1,402	599	0
	CUM. LANDFILL	2,803	6,398	6,398
STATE & PRIVATE PROGRAMS	INCINERATION	662	662	1,029
	STABILIZATION	3,398	3,398	2,946
	LANDFILL	491	491	529
	CUM. LANDFILL	981	3,924	11,328
ALL SOURCES	INCINERATION	5,704	8,609	10,973
	STABILIZATION	7,565	45,189	31,103
	LANDFILL	7,427	6,389	6,269
	CUM. LANDFILL	14,854	53,190	140,959

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

OKLAHOMA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	1,005	443	584
	STABILIZATION	825	864	854
	LANDFILL	1,232	639	787
	CUM. LANDFILL	2,463	6,295	17,310
SUPERFUND REMOVAL ACTION	INCINERATION	118	124	127
	STABILIZATION	276	289	296
	LANDFILL	203	212	218
	CUM. LANDFILL	407	1,681	4,734
RCRA CORRECTIVE ACTION	INCINERATION	0	17	7
	STABILIZATION	0	6,905	8,878
	LANDFILL	0	1,765	756
	CUM. LANDFILL	0	10,590	21,179
HAZARDOUS SUBSTANCE USTS	INCINERATION	476	234	0
	STABILIZATION	106	52	0
	LANDFILL	581	287	0
	CUM. LANDFILL	1,163	2,882	2,882
STATE & PRIVATE PROGRAMS	INCINERATION	65	65	64
	STABILIZATION	659	659	1,063
	LANDFILL	230	230	168
	CUM. LANDFILL	460	1,839	4,189
ALL SOURCES	INCINERATION	1,664	884	783
	STABILIZATION	1,865	8,768	11,092
	LANDFILL	2,246	3,132	1,929
	CUM. LANDFILL	4,492	23,286	50,294

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

OREGON

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	2,321	50	618
	LANDFILL	5,482	75	1,427
	CUM. LANDFILL	10,963	11,413	31,386
SUPERFUND REMOVAL ACTION	INCINERATION	87	91	93
	STABILIZATION	203	212	217
	LANDFILL	149	156	160
	CUM. LANDFILL	298	1,233	3,471
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	1,123	2,887
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	898	424	0
	STABILIZATION	200	94	0
	LANDFILL	1,098	518	0
	CUM. LANDFILL	2,196	5,303	5,303
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	159	159	382
	LANDFILL	154	154	154
	CUM. LANDFILL	309	1,235	3,397
ALL SOURCES	INCINERATION	985	514	93
	STABILIZATION	2,882	1,637	4,104
	LANDFILL	6,883	903	1,741
	CUM. LANDFILL	13,766	19,184	43,557

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT [illegible]

PENNSYLVANIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	4,647	11,554	9,827
	STABILIZATION	3,811	19,110	15,285
	LANDFILL	5,692	16,694	13,943
	CUM. LANDFILL	11,384	111,545	306,749
SUPERFUND REMOVAL ACTION	INCINERATION	932	974	1,000
	STABILIZATION	2,175	2,272	2,332
	LANDFILL	1,600	1,671	1,715
	CUM. LANDFILL	3,199	13,224	37,238
RCRA CORRECTIVE ACTION	INCINERATION	2,850	4,749	3,935
	STABILIZATION	0	23,714	30,490
	LANDFILL	1,438	3,116	2,466
	CUM. LANDFILL	2,877	21,575	56,096
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,927	889	0
	STABILIZATION	428	198	0
	LANDFILL	2,355	1,087	0
	CUM. LANDFILL	4,710	11,233	11,233
STATE & PRIVATE PROGRAMS	INCINERATION	1,531	1,531	1,494
	STABILIZATION	3,599	3,599	4,988
	LANDFILL	1,804	1,804	1,779
	CUM. LANDFILL	3,608	14,433	39,336
ALL SOURCES	INCINERATION	11,886	19,698	16,256
	STABILIZATION	10,013	48,893	53,096
	LANDFILL	12,889	24,372	19,903
	CUM. LANDFILL	25,778	172,010	450,651

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

PUERTO RICO

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	971	728
	STABILIZATION	0	1,068	801
	LANDFILL	0	1,230	922
	CUM. LANDFILL	0	7,378	20,290
SUPERFUND REMOVAL ACTION	INCINERATION	24	25	25
	STABILIZATION	55	58	59
	LANDFILL	41	42	44
	CUM. LANDFILL	81	336	947
RCRA CORRECTIVE ACTION	INCINERATION	0	34,980	14,992
	STABILIZATION	6,590	2,197	4,707
	LANDFILL	0	819	1,054
	CUM. LANDFILL	0	4,917	19,667
HAZARDOUS SUBSTANCE USTS	INCINERATION	495	271	0
	STABILIZATION	110	60	0
	LANDFILL	604	331	0
	CUM. LANDFILL	1,209	3,198	3,198
STATE & PRIVATE PROGRAMS	INCINERATION	2,947	2,947	1,718
	STABILIZATION	447	447	601
	LANDFILL	167	167	215
	CUM. LANDFILL	334	1,336	4,346
ALL SOURCES	INCINERATION	3,465	39,194	17,463
	STABILIZATION	7,202	3,830	6,169
	LANDFILL	812	2,590	2,234
	CUM. LANDFILL	1,624	17,165	48,447

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT [illegible]

RHODE ISLAND

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	87	91	93
	STABILIZATION	203	212	217
	LANDFILL	149	156	160
	CUM. LANDFILL	298	1,233	3,471
RCRA CORRECTIVE ACTION	INCINERATION	0	74	32
	STABILIZATION	0	141	212
	LANDFILL	0	235	302
	CUM. LANDFILL	0	1,409	5,637
HAZARDOUS SUBSTANCE USTS	INCINERATION	405	181	0
	STABILIZATION	90	40	0
	LANDFILL	495	221	0
	CUM. LANDFILL	990	2,314	2,314
STATE & PRIVATE PROGRAMS	INCINERATION	6	6	3
	STABILIZATION	12	12	23
	LANDFILL	19	19	33
	CUM. LANDFILL	39	154	616
ALL SOURCES	INCINERATION	498	351	128
	STABILIZATION	304	405	452
	LANDFILL	663	631	495
	CUM. LANDFILL	1,327	5,110	12,038

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

SOUTH CAROLINA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	2,142	1,606
	STABILIZATION	0	1,943	1,457
	LANDFILL	0	2,931	2,198
	CUM. LANDFILL	0	17,585	48,359
SUPERFUND REMOVAL ACTION	INCINERATION	237	248	254
	STABILIZATION	553	578	593
	LANDFILL	407	425	436
	CUM. LANDFILL	813	3,362	9,467
RCRA CORRECTIVE ACTION	INCINERATION	0	491	368
	STABILIZATION	15,404	5,135	15,404
	LANDFILL	0	247	212
	CUM. LANDFILL	0	1,481	4,443
HAZARDOUS SUBSTANCE USTS	INCINERATION	832	402	0
	STABILIZATION	185	89	0
	LANDFILL	1,017	491	0
	CUM. LANDFILL	2,034	4,980	4,980
STATE & PRIVATE PROGRAMS	INCINERATION	214	214	214
	STABILIZATION	1,000	1,000	1,842
	LANDFILL	258	258	261
	CUM. LANDFILL	516	2,065	5,720
ALL SOURCES	INCINERATION	1,283	3,496	2,443
	STABILIZATION	17,141	8,744	19,295
	LANDFILL	1,682	4,352	3,107
	CUM. LANDFILL	3,364	29,473	72,969

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

SOUTH DAKOTA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	370	277
	STABILIZATION	0	370	277
	LANDFILL	0	533	399
	CUM. LANDFILL	0	3,196	8,788
SUPERFUND REMOVAL ACTION	INCINERATION	63	66	68
	STABILIZATION	147	154	158
	LANDFILL	108	113	116
	CUM. LANDFILL	217	897	2,525
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	162	87	0
	STABILIZATION	36	19	0
	LANDFILL	197	106	0
	CUM. LANDFILL	395	1,033	1,033
STATE & PRIVATE PROGRAMS	INCINERATION	30	30	30
	STABILIZATION	30	30	30
	LANDFILL	43	43	43
	CUM. LANDFILL	86	346	951
ALL SOURCES	INCINERATION	255	553	375
	STABILIZATION	213	573	466
	LANDFILL	349	795	559
	CUM. LANDFILL	698	5,471	13,297

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

TENNESSEE

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	119	335	281
	STABILIZATION	98	819	639
	LANDFILL	146	492	406
	CUM. LANDFILL	293	3,245	8,923
SUPERFUND REMOVAL ACTION	INCINERATION	111	116	119
	STABILIZATION	258	270	277
	LANDFILL	190	198	204
	CUM. LANDFILL	380	1,569	4,418
RCRA CORRECTIVE ACTION	INCINERATION	0	12,828	19,242
	STABILIZATION	0	9,309	3,990
	LANDFILL	487	487	487
	CUM. LANDFILL	974	3,894	10,709
HAZARDOUS SUBSTANCE USTS	INCINERATION	976	409	0
	STABILIZATION	217	91	0
	LANDFILL	1,193	499	0
	CUM. LANDFILL	2,387	5,382	5,382
STATE & PRIVATE PROGRAMS	INCINERATION	1,082	1,082	2,134
	STABILIZATION	833	833	505
	LANDFILL	97	97	97
	CUM. LANDFILL	194	777	2,137
ALL SOURCES	INCINERATION	2,289	14,769	21,776
	STABILIZATION	1,406	11,322	5,411
	LANDFILL	2,113	1,773	1,193
	CUM. LANDFILL	4,227	14,867	31,569

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]S MANAGEMENT CATEGORY, AND BY YEAR
(SHORT [illegible]

TEXAS

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	244	6,482	1,459
	STABILIZATION	200	1,472	1,154
	LANDFILL	299	2,456	1,716
	CUM. LANDFILL	597	15,330	39,359
SUPERFUND REMOVAL ACTION	INCINERATION	766	800	822
	STABILIZATION	1,788	1,867	1,917
	LANDFILL	1,315	1,373	1,410
	CUM. LANDFILL	2,630	10,870	30,610
RCRA CORRECTIVE ACTION	INCINERATION	0	0	9
	STABILIZATION	0	4,003	3,431
	LANDFILL	2,973	0	425
	CUM. LANDFILL	5,945	5,945	11,890
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,977	961	0
	STABILIZATION	439	214	0
	LANDFILL	2,417	1,174	0
	CUM. LANDFILL	4,833	11,879	11,879
STATE & PRIVATE PROGRAMS	INCINERATION	533	533	159
	STABILIZATION	453	453	500
	LANDFILL	289	289	232
	CUM. LANDFILL	577	2,309	5,560
ALL SOURCES	INCINERATION	3,520	8,776	2,449
	STABILIZATION	2,880	8,009	7,003
	LANDFILL	7,291	5,292	3,783
	CUM. LANDFILL	14,583	46,334	99,298

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

UTAH

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	60	45
	LANDFILL	0	90	68
	CUM. LANDFILL	0	540	1,485
SUPERFUND REMOVAL ACTION	INCINERATION	87	91	93
	STABILIZATION	203	212	217
	LANDFILL	149	156	160
	CUM. LANDFILL	298	1,233	3,471
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	138	50	0
	STABILIZATION	31	11	0
	LANDFILL	169	61	0
	CUM. LANDFILL	338	706	706
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	5	5	5
	LANDFILL	7	7	7
	CUM. LANDFILL	15	58	161
ALL SOURCES	INCINERATION	225	141	93
	STABILIZATION	238	288	267
	LANDFILL	326	314	235
	CUM. LANDFILL	651	2,538	5,823

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]APS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

VERMONT

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	1,124	843
	STABILIZATION	0	975	731
	LANDFILL	0	1,504	1,128
	CUM. LANDFILL	0	9,023	24,812
SUPERFUND REMOVAL ACTION	INCINERATION	55	58	59
	STABILIZATION	129	135	138
	LANDFILL	95	99	102
	CUM. LANDFILL	190	784	2,209
RCRA CORRECTIVE ACTION	INCINERATION	0	1,531	656
	STABILIZATION	62	0	9
	LANDFILL	0	8	3
	CUM. LANDFILL	0	45	90
HAZARDOUS SUBSTANCE USTS	INCINERATION	51	23	0
	STABILIZATION	11	5	0
	LANDFILL	62	28	0
	CUM. LANDFILL	124	295	295
STATE & PRIVATE PROGRAMS	INCINERATION	217	217	163
	STABILIZATION	81	81	80
	LANDFILL	123	123	122
	CUM. LANDFILL	245	982	2,696
ALL SOURCES	INCINERATION	323	2,953	1,722
	STABILIZATION	283	1,196	958
	LANDFILL	280	1,762	1,355
	CUM. LANDFILL	560	11,129	30,102

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

VIRGIN ISLANDS

		1993	1999	2013
SUPERFUND REMOVAL ACTION	INCINERATION	12	12	13
	STABILIZATION	28	29	30
	LANDFILL	20	21	22
	CUM. LANDFILL	81	336	947
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
HAZARDOUS SUBSTANCE USTS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
ALL SOURCES	INCINERATION	12	12	13
	STABILIZATION	28	29	30
	LANDFILL	20	21	22
	CUM. LANDFILL	81	336	947

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

VIRGINIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	4,005	13,148	10,863
	STABILIZATION	3,285	25,291	19,790
	LANDFILL	4,906	18,751	15,290
	CUM. LANDFILL	9,812	122,317	336,371
SUPERFUND REMOVAL ACTION	INCINERATION	79	83	85
	STABILIZATION	184	193	198
	LANDFILL	136	142	145
	CUM. LANDFILL	271	1,121	3,156
RCRA CORRECTIVE ACTION	INCINERATION	0	561	481
	STABILIZATION	2,829	2,829	3,638
	LANDFILL	0	646	415
	CUM. LANDFILL	0	3,873	9,683
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,607	758	0
	STABILIZATION	357	168	0
	LANDFILL	1,964	926	0
	CUM. LANDFILL	3,929	9,485	9,485
STATE & PRIVATE PROGRAMS	INCINERATION	1,222	1,222	1,228
	STABILIZATION	2,451	2,451	2,540
	LANDFILL	1,708	1,708	1,700
	CUM. LANDFILL	3,416	13,663	37,467
ALL SOURCES	INCINERATION	6,913	15,772	12,657
	STABILIZATION	9,107	30,933	26,165
	LANDFILL	8,714	22,172	17,550
	CUM. LANDFILL	17,427	150,458	396,161

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

WASHINGTON

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	1,444	1,083
	STABILIZATION	0	1,573	1,180
	LANDFILL	0	1,398	1,048
	CUM. LANDFILL	0	8,387	23,065
SUPERFUND REMOVAL ACTION	INCINERATION	150	157	161
	STABILIZATION	350	366	376
	LANDFILL	258	269	276
	CUM. LANDFILL	515	2,129	5,996
RCRA CORRECTIVE ACTION	INCINERATION	0	0	2,491
	STABILIZATION	4,300	8,600	9,829
	LANDFILL	10,849	1,808	1,550
	CUM. LANDFILL	21,698	32,546	54,244
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,291	544	0
	STABILIZATION	287	121	0
	LANDFILL	1,578	665	0
	CUM. LANDFILL	3,156	7,148	7,148
STATE & PRIVATE PROGRAMS	INCINERATION	117	117	390
	STABILIZATION	950	950	1,202
	LANDFILL	558	558	283
	CUM. LANDFILL	1,117	4,466	8,427
ALL SOURCES	INCINERATION	1,559	2,262	4,124
	STABILIZATION	5,888	11,611	12,587
	LANDFILL	13,243	4,699	3,157
	CUM. LANDFILL	26,486	54,677	98,880

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

WEST VIRGINIA

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	1,808	0	452
	STABILIZATION	1,483	0	371
	LANDFILL	2,215	0	554
	CUM. LANDFILL	4,430	4,430	12,183
SUPERFUND REMOVAL ACTION	INCINERATION	411	429	440
	STABILIZATION	958	1,001	1,028
	LANDFILL	705	736	756
	CUM. LANDFILL	1,410	5,827	16,410
RCRA CORRECTIVE ACTION	INCINERATION	0	3,959	6,221
	STABILIZATION	3,055	1,018	2,182
	LANDFILL	1,507	0	1,723
	CUM. LANDFILL	3,014	3,014	27,130
HAZARDOUS SUBSTANCE USTS	INCINERATION	357	147	0
	STABILIZATION	79	33	0
	LANDFILL	436	179	0
	CUM. LANDFILL	872	1,948	1,948
STATE & PRIVATE PROGRAMS	INCINERATION	374	374	729
	STABILIZATION	207	207	279
	LANDFILL	101	101	248
	CUM. LANDFILL	202	809	4,285
ALL SOURCES	INCINERATION	2,949	4,908	7,842
	STABILIZATION	5,783	2,259	3,860
	LANDFILL	4,964	1,017	3,280
	CUM. LANDFILL	9,929	16,029	61,955

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT TONS)

WISCONSIN

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	2,777	2,083
	STABILIZATION	0	2,885	2,164
	LANDFILL	0	3,521	2,641
	CUM. LANDFILL	0	21,129	58,103
SUPERFUND REMOVAL ACTION	INCINERATION	190	198	203
	STABILIZATION	442	462	474
	LANDFILL	325	340	349
	CUM. LANDFILL	651	2,690	7,574
RCRA CORRECTIVE ACTION	INCINERATION	1,437	1,916	2,155
	STABILIZATION	0	18,428	8,885
	LANDFILL	0	40	35
	CUM. LANDFILL	0	242	726
HAZARDOUS SUBSTANCE USTS	INCINERATION	1,480	675	0
	STABILIZATION	329	150	0
	LANDFILL	1,809	824	0
	CUM. LANDFILL	3,618	8,565	8,565
STATE & PRIVATE PROGRAMS	INCINERATION	422	422	461
	STABILIZATION	1,745	1,745	1,206
	LANDFILL	289	289	290
	CUM. LANDFILL	578	2,313	6,368
ALL SOURCES	INCINERATION	3,528	5,986	4,902
	STABILIZATION	2,517	23,670	12,729
	LANDFILL	2,424	5,015	3,314
	CUM. LANDFILL	4,847	34,938	81,336

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURC[illegible]PS MANAGEMENT CATEGORY, AND BY YEAR
(SHORT[illegible]

WYOMING

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	0
	LANDFILL	0	0	0
	CUM. LANDFILL	0	0	0
SUPERFUND REMOVAL ACTION	INCINERATION	63	66	68
	STABILIZATION	147	154	158
	LANDFILL	108	113	116
	CUM. LANDFILL	217	897	2,525
RCRA CORRECTIVE ACTION	INCINERATION	0	0	0
	STABILIZATION	0	0	3,283
	LANDFILL	0	0	3,270
	CUM. LANDFILL	0	0	45,778
HAZARDOUS SUBSTANCE USTS	INCINERATION	91	44	0
	STABILIZATION	20	10	0
	LANDFILL	111	54	0
	CUM. LANDFILL	222	544	544
STATE & PRIVATE PROGRAMS	INCINERATION	0	0	0
	STABILIZATION	0	0	359
	LANDFILL	0	0	358
	CUM. LANDFILL	0	0	5,005
ALL SOURCES	INCINERATION	154	110	68
	STABILIZATION	168	164	3,800
	LANDFILL	219	167	3,744
	CUM. LANDFILL	439	1,440	53,851

ONE-TIME WASTE: REQUIRED CAPACITY BY SOURCE, CAPS MANAGEMENT CATEGORY, AND BY YEAR (SHORT TONS)

ALL STATES

		1993	1999	2013
SUPERFUND REMEDIAL ACTION	INCINERATION	61,816	132,050	111,028
	STABILIZATION	53,050	162,759	135,332
	LANDFILL	82,917	172,232	149,703
	CUM. LANDFILL	165,835	1,199,228	3,295,076
SUPERFUND REMOVAL ACTION	INCINERATION	13,418	14,014	14,386
	STABILIZATION	31,307	32,698	33,568
	LANDFILL	23,026	24,049	24,689
	CUM. LANDFILL	46,432	191,919	540,413
RCRA CORRECTIVE ACTION	INCINERATION	35,100	155,286	143,364
	STABILIZATION	201,437	549,543	545,206
	LANDFILL	26,001	34,155	34,294
	CUM. LANDFILL	52,002	256,933	737,056
HAZARDOUS SUBSTANCE USTS	INCINERATION	69,580	26,302	0
	STABILIZATION	15,462	5,845	0
	LANDFILL	85,042	32,147	0
	CUM. LANDFILL	170,085	362,967	362,970
STATE & PRIVATE PROGRAMS	INCINERATION	26,203	26,203	27,854
	STABILIZATION	65,530	65,530	74,334
	LANDFILL	19,656	19,656	19,955
	CUM. LANDFILL	39,312	157,250	436,624
ALL SOURCES	INCINERATION	206,116	353,855	296,632
	STABILIZATION	366,786	816,375	788,439
	LANDFILL	236,643	282,240	228,642
	CUM. LANDFILL	473,666	2,168,297	5,372,138