United States
Environmental Protection
Agency

Office of Solid Waste and
Emergency Response
Washington, D.C. 20460

OSWER Directive
Number 9010.02
May 1993

EPA

Guidance For Capacity Assurance Planning

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

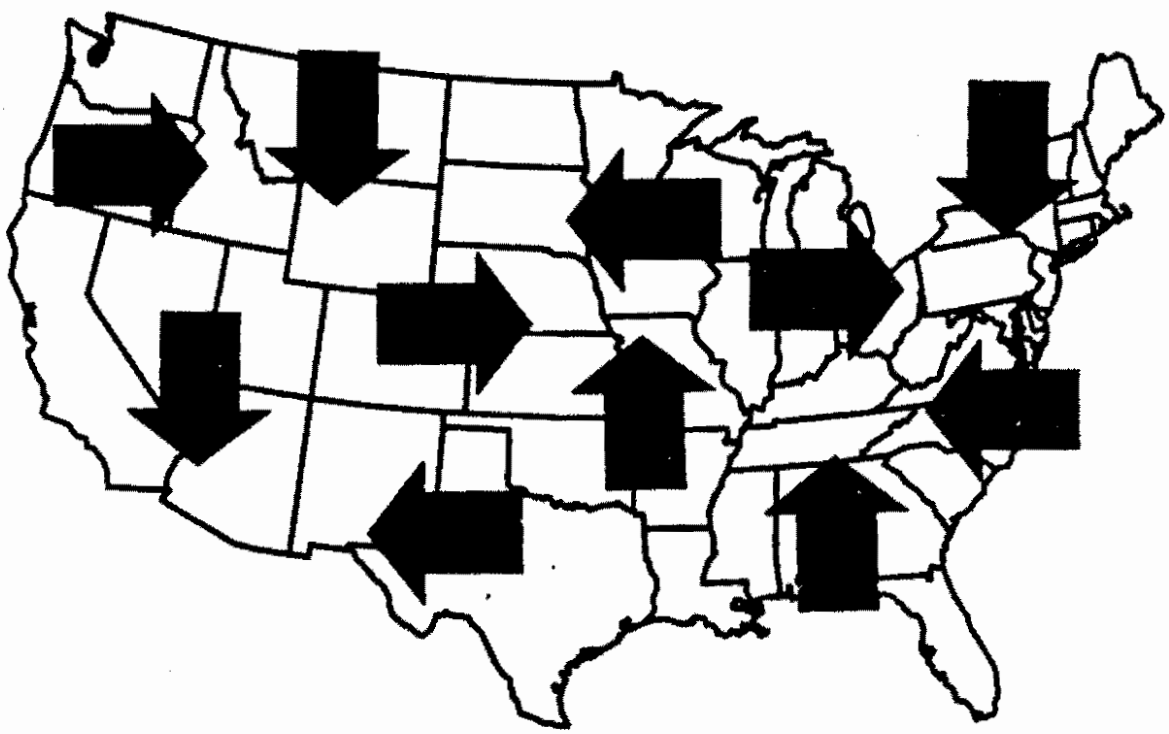


TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

LIST OF EXHIBITS

LIST OF EXHIBITS (CONTINUED)

1. Overview of Capacity Assurance Planning

1.1 INTRODUCTION

This Guidance document advises states on how to assure adequate hazardous waste treatment and disposal capacity for meeting the requirements of Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA or "Superfund") (42 U.S.C. §9604(c)(9)), as amended, by preparing 1993 hazardous waste Capacity Assurance Plans (CAPs). It supersedes similar guidance documents issued in December 1988 and April 1991, and should be used by states for the 1993 capacity assurance planning process. States that have CAPs approved by the U.S. Environmental Protection Agency (EPA) will be eligible to receive new Superfund remedial action funding. The information collection activities for the 1993 Capacity Assurance Planning process have been approved by the Office of Management and Budget under OMB Control Number 2050-0099.

CERCLA §104(c)(9)

States prepare CAPs pursuant to CERCLA §104(c)(9). The statute requires that, prior to the President providing funding for any remedial actions, a state must assure the availability of hazardous waste treatment or disposal facilities that have adequate capacity to manage the hazardous waste reasonably expected to be generated within the state over 20 years. These assurances must be provided in a contract or cooperative agreement entered into between that state and the President. After October 17, 1989, no new Superfund remedial actions may be funded using federal remedial action resources unless a state first enters into such an agreement providing assurances that the President deems adequate. The President has delegated the authority to determine adequacy to the EPA Administrator (the Administrator).

Congress adopted CERCLA §104(c)(9) to oblige states to take responsibility for making certain that there will be adequate and safe treatment or disposal for the wastes that continue to be generated within their borders.

Provisions of CERCLA §104(c)(9)

There are six important aspects to Section 104(c)(9). First, it became effective on October 17, 1989, three years after enactment. Second, the Administrator cannot provide any remedial action funding pursuant to Section 104 after that date unless specific assurances are provided. Third, the state must assure the availability of facilities to treat, destroy, or securely dispose of all hazardous waste reasonably projected to be generated within the state for 20 years and such facilities are in compliance with Subtitle C of the Resource Conservation and Recovery Act (RCRA). Fourth, the state in which the funding is requested must provide these assurances in a contract or cooperative agreement entered into with the Administrator. Fifth, availability of facilities that are outside the state must be assured in accordance with an interstate agreement or regional agreement or authority. Finally, the assurances provided must be deemed adequate by the Administrator.

42 U.S.C. §9604(c)(9)

Siting. Effective 3 years after October 17, 1986, the President shall not provide any remedial actions pursuant to this section unless the State in which the release occurs first enters into a contract or cooperative agreement with the President providing assurances deemed adequate by the President that the State will assure the availability of hazardous waste treatment or disposal facilities which —

(A) have adequate capacity for the destruction, treatment, or secure disposition of all hazardous wastes that are reasonably expected to be generated within the State during the 20-year period following the date of such contract or cooperative agreement and to be disposed of, treated, or destroyed,

(B) are within the State or outside the State in accordance with an interstate agreement or regional agreement or authority,

(C) are acceptable to the President, and

(D) are in compliance with the requirements of subtitle C of the Solid Waste Disposal Act [42 U.S.C. §6921 et seq].

EPA's Implementation of CERCLA §104(c)(9)

EPA provides funding to the states for remedial actions through Superfund contracts and cooperative agreements. Under Section 104(c)(9), the Administrator will enter into contracts or cooperative agreements only with those states that provide assurances regarding the availability of capacity for 20 years from the date of signature.

EPA's interpretation of the legislative intent of this provision is that states must understand what waste will be generated within their borders and must plan to assure the availability of capacity to manage this waste, either within the state or outside the state in accordance with an interstate agreement or regional agreement or authority. The assurances provided in the contract or cooperative agreement, therefore, are based upon the state's commitment to taking the actions necessary to ensure the availability of adequate management capacity pursuant to its planning documents and in accordance with its interstate agreements. This document provides guidance on how states should prepare CAPs, which EPA will review to determine whether adequate assurances are provided.

EPA does not intend for the CAP process to override or interfere with state requirements or efforts to plan or provide for the management of wastes. Development of new capacity may be in a state's best interest even if the assessment of national capacity indicates that sufficient projected capacity will exist in the future. For instance, capacity development may be necessary in a state for many reasons, including, to replace inefficient technologies with safer and more effective innovative technologies, to decrease costs for in-state industries, and to encourage business growth within a state. In addition, Subtitle C management technologies are also used for the safe and secure disposal of large volumes of other wastes not incorporated into EPA's capacity assessment such as those wastes regulated under the Toxic Substance Control Act (i.e., polychlorinated biphenyls) and many industrial non-hazardous wastes; consequently, a state may desire the development of more capacity than necessary to demonstrate adequate capacity assurance.

EPA Regulations

The statutory requirements for capacity assurance have been codified in the National Oil and Hazardous Substances Contingency Plan (40 CFR 300.510(e)) (see Appendix A). In the preamble to the rule-making, EPA stated that it would use the following criteria to determine the adequacy of a state's assurance (55 *Federal Register* 8666, 8778, March 8, 1990):

(1) The plan submitted to EPA documenting hazardous waste capacity availability;

(2) The state's written commitment to the plan; and

(3) The state's written commitment to implement any additional measures EPA deems necessary to provide for adequate hazardous waste capacity (e.g., the provisions of this Guidance document).

National Policy

Waste reduction can yield significant benefits to states by reducing projected generation and its resulting pressure on capacity, slowing the increase in waste management costs, reducing liability, and improving the quality of human health and the environment. EPA believes that reducing waste generation through waste minimization efforts is preferable to siting and permitting facilities to manage wastes that are generated. In the 1984 Hazardous and Solid Waste Amendments to RCRA, Congress expressed a clear preference for reducing or eliminating the generation of hazardous waste over managing such waste at treatment, storage, or disposal facilities.

> "The Congress hereby declares it to be the national policy of the United States that, wherever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment."[1]

Waste minimization has been an important component of previous CAPs and EPA encourages states to incorporate waste minimization into their 1993 CAPs and future CAPs.

Nature of the Assurance Submittal

Section 104(c)(9) requires that the assurance made by the state regarding availability of sufficient hazardous waste capacity be deemed adequate by the Administrator. The legislative history of the section provides little guidance regarding how the Administrator is to exercise this discretion. Based on the statutory language and relevant legislative history, however, EPA has provided guidance on how states should provide assurances.

---

[1] 42 U.S.C. §6902(b).

Again, the Administrator cannot enter into contracts or cooperative agreements unless the assurances are deemed adequate. The contracts or cooperative agreements must address hazardous waste generated within the state for 20 years and must assure the availability of adequate capacity to manage this waste at facilities that are in compliance with Subtitle C of RCRA, acceptable to the EPA Administrator, have adequate capacity to destroy, treat, or dispose of the generated waste, and, if outside the state, are in accordance with an interstate agreement or regional agreement or authority.

Assistance

EPA will continue to make technical and administrative assistance available to states through the EPA Regional offices. Two hotlines are also available. The Biennial Reporting System (BRS) hotline (1-800-876-0352) will provide technical assistance to help states develop data tables. The RCRA/Superfund hotline (1-800-424-9346) can answer questions regarding the CAP.

Previous CAPs

1989 CAP Guidance Document

Shortly after the amendment of CERCLA in 1986, EPA convened an internal workgroup to oversee the implementation of the capacity assurance requirements. EPA also issued a grant to the National Governors' Association (NGA) to develop a set of uniform and consistent recommendations on what constitutes an adequate CAP. The NGA convened a series of workgroups, comprised of 60 state officials from 38 states and representatives from industrial and environmental groups, to develop guidance and, in May 1988, delivered its guidance package to EPA.

With some revisions to the NGA guidance, EPA issued a Guidance document, *Assurance of Hazardous Waste Capacity: Guidance to State Officials* (OSWER Directive Number 9010.00 or the 1989 CAP Guidance document) in December 1988. That Guidance document reflected EPA's understanding of the statutory requirements of CERCLA §104(c)(9) and suggested specific approaches and formats for state demonstrations of the availability of future capacity.

The 1989 CAP Guidance document included instructions on preparing state CAPs and model language for interstate or regional agreements for demonstrating future availability of capacity in other states. The 1989 CAP Guidance document instructed states to submit CAPs that:

- Described baseyear (1987) hazardous waste generation and management, accounting for domestic imports and exports;
- Projected future generation and management in 1989, 1995, and 2009, incorporating the impacts of economic change, waste minimization, and new regulations;

The NGA Group also felt that the EPA did not review CAPs consistently, and that enforcement of the CAPs was not being taken seriously. In addition, the NGA Group believed federal lawmakers did not fully understand the problems underlying the law. In particular, the conflict between the states' inability to build new facilities and the only hammer in the statute (i.e., penalize the state if needed capacity isn't developed) often left states subject to a demanding and sometimes contentious process without resolution.

Recommendations

The NGA Group developed a number of recommendations for improving the capacity assurance planning process in a document entitled: "Hazardous Waste Management in the States: A Review of the Capacity Assurance Process." These include:

- **Reduce the scope of data collection and analysis.** The NGA Group recommended that neither mixed hazardous/radioactive waste nor waste managed in exempt processes should be included in CAP reporting. In addition, the NGA Group recommended that results be presented only by waste management category.

- **Focus analysis on waste managed off site**, thereby concentrating CAPs on the commercial waste market, interstate waste shipments, and large, off-site captive facilities. The NGA Group recommended that states still report baseyear on-site waste management in a summary fashion.

- **Emphasize the first five years from the date of CAP submittal for projections.** The NGA Group recommended that states conduct realistic 5-year projections of hazardous waste management in commercial facilities and thereafter hold projections constant to satisfy the statutory 20-year planning requirement.

- **Use the Biennial Report as the primary data source for CAPs.** The NGA Group believed that the lack of consistent data had made many state-to-state comparisons of the 1989 CAP data difficult.

- **Implement an enforcement policy that would make CAPs and interstate agreements more meaningful.** A majority of the states in the NGA Group urged EPA to enforce the CAPs, using clear and consistent criteria. In addition, these states recommended that EPA withdraw approval of any CAP that is part of an invalid interstate agreement, unless the state itself can certify that its own capacity is adequate for current and future needs.

1992 CAPs

EPA modified requirements for the 1992 CAP in response to the states' concerns that additional discussion was necessary before another quantitative assessment was conducted on capacity. These requirements appeared in an April 15, 1992 Guidance document entitled "Assurance of Hazardous Waste Capacity: Guidance to State Officials" (OSWER Directive

- Compared projected in-state demand against projected in-state capacity in the projection years; and

- If the comparison identified shortfalls, presented negotiated interstate (or regional) agreements, increased waste minimization efforts, and/or commitments to increase in-state capacity sufficient to eliminate the shortfalls.

Production of 1989 CAPs

Although each state had the sole responsibility for preparing its 1989 CAP, EPA provided assistance and the states worked together throughout the CAP development process. EPA's efforts to assist states stemmed largely from the realization that the data and analysis required to prepare an adequate CAP would demand substantial technical and data management expertise and that states varied in the level of expertise in this area. To assist states in compiling and analyzing their data, EPA furnished the *Technical Reference Manual for Reporting the Current Status of Generation, Management Capacity, Imports and Exports* (January 1989) and state-specific reports of hazardous waste management capacity using the results of the EPA's *National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities* (TSDR Survey).

During the 1989 capacity assurance planning process, some states organized into multi-state or regional groups, while others attempted to demonstrate self-sufficiency. The regional groups were formed largely because many states could not assure waste management capacity solely by relying on in-state capacity and waste minimization; they needed capacity in other states. States entered into preliminary regional agreement discussions along EPA Regional lines in part because EPA contractor assistance was available on an EPA Regional basis. Furthermore, states within EPA Regions often faced similar waste management issues and, therefore, benefitted from each other's efforts and hazardous waste planning experience.

Concerns About 1989 CAPs

In response to concerns about the 1989 CAP, EPA and NGA organized the CAP Policy Development Group (the NGA Group), composed of state officials. The NGA Group identified a number of issues with the 1989 CAPs and developed recommendations for improving them for the 1993 cycle.

The NGA Group had mixed opinions about whether the CAP is an effective planning tool. Most participants agreed that the regional groups formed to prepare the 1989 CAPs provided useful forums for discussing waste management needs and plans. Many officials also agreed that CAPs provide a useful picture of waste management nationwide. However, they considered the CAPs themselves to be unrealistic as state plans. Many officials thought that the states were developing better waste management plans through their own initiative outside of the CAP process. Furthermore, they believed that the interstate agreements that were reached to balance capacity and demand in 1989 did not necessarily reflect real waste flows.

Number 9471.00-01a). In 1992, states submitted their second CAP. In these plans, states provided a qualitative report on the post-1989 CAP developments to EPA, including changes in their hazardous waste management systems, new siting efforts, and new waste minimization programs.

Objective of the 1993 CAP

Having reflected on the previous CAP submittals and evaluated resultant issues, EPA has modified the capacity assurance planning process for the 1993 CAP. While the 1989 CAPs did meet the requirements of the law, the process did not necessarily encourage or enhance ongoing and potential future waste minimization efforts or efficiently promote needed capacity development.

For the 1993 CAP, the availability of national capacity will be the key determinant of whether the states need to engage in further planning efforts. EPA believes that states can meet the concerns expressed by Congress in CERCLA §104(c)(9) by planning to meet future capacity requirements for only those waste management technologies where there is projected to be insufficient national capacity. EPA also believes that such a planning approach will more closely reflect reality and foster cooperation among states to address real capacity and siting challenges. Furthermore, in taking a national approach to capacity assurance planning as outlined in this Guidance document, EPA believes it has significantly reduced the amount of data collection and analyses required to satisfy the statute and, consequently, the burden on states in preparing 1993 CAPs.

The national capacity approach comports with CERCLA §104(c)(9) and its legislative history because it meets the goal of the adequate assurance of capacity for the destruction, treatment, or secure disposition of all hazardous wastes generated within states. The statute provides that the capacity may be within the state or outside the state, and Congress recognized that multistate efforts may be appropriate to assure adequate capacity. The national capacity approach achieves these objectives by developing policies and programs to assess capacity on a national basis. By utilizing a national capacity approach, policies for the best use of existing facilities can be developed nationwide in the short term, and if shortfalls occur, policies can be utilized for the development of additional capacity where it is needed most, without each state having to site unnecessary facilities. However, if additional facilities must be sited, the states retain their responsibility to site such facilities. If a state fails to adequately address any identified shortfall, remedial action funds will be withheld from the state in accordance with CERCLA §104(c)(9).

EPA expects that by developing a multi-phase process for the 1993 CAPs it has reduced the burden on states. In the initial phase, states will submit baseyear and projections data. The baseyear is the most recent year for which Biennial Report data on RCRA Subtitle C hazardous waste generation and management are available. For the 1993 CAPs, the baseyear will be 1991. Baseyear data are used in the CAPs to depict each state's existing hazardous waste management system. Chapter 2 describes the methods and formats states should use to calculate and present baseyear information for their CAPs.

Baseyear data are used as the foundation for making projections of future hazardous waste demand and capacity. States should make these projections to provide a foundation

for the 20-year assurance of adequate hazardous waste management capacity. Baseyear data and projections together provide a framework for EPA to evaluate each state's demonstration that it has assured the availability of adequate hazardous waste management capacity for the next 20 years. Chapter 3 of this Guidance document provides methods for analyzing existing data on waste generation and capacity use and for projecting waste generation within the state, including the effects of new regulations. Subsequent phases of the 1993 CAPs will only address capacity in the shortfall management categories, if any exist.

In developing this new multi-phased approach for the 1993 capacity assurance planning process, EPA incorporated the NGA Group's recommendations to the maximum extent appropriate. In addition, EPA prepared a draft guidance document for public review and comment (see 57 *Federal Register* 41496, September 10, 1992); summarized and prepared responses to the comments from states and others; and incorporated many of their suggestions into this document.

Future CAPs

The capacity assurance planning process is a continuing planning effort. States are expected to submit new CAPs on a regular basis to remain eligible for Superfund remedial action funding. These CAPs should use new data collected in the most recent Biennial Report (or equivalent data) to prepare baseyear descriptions and project future demand and capacity. As the Biennial Report may be the best nationwide source of data on hazardous waste demand and on management capacity, states should continue to focus resources on improving Biennial Report data collection, particularly when they are not preparing CAPs. Those states using data sources equivalent to BRS should also continue to work on improving data quality.

EPA believes the submittal of CAPs by states is appropriate, regardless of whether the state expects to receive Superfund remedial action funds before the next CAP reporting cycle. Given the dynamic nature of the hazardous waste universe, EPA believes that examining trends in waste generation and management on a regular basis is necessary to plan adequately for the future. Thus, EPA believes that new CAPs will be necessary to adequately incorporate any changes. EPA currently plans to conduct the CAP process presented in this Guidance every four years.

EPA also believes that failure on the part of any state to submit a CAP jeopardizes the goal expressed by states and the NGA and endorsed by EPA of national consistency in the capacity assurance planning process. If a state accepts funds from EPA to complete CAP-related activities but does not submit a CAP, EPA will consider the state to have acted in bad faith, and will not provide the state with future funding for CAP preparation.

CAP Maintenance

Finally, the statute requires that before Superfund remedial action funds are provided, the state in which the release occurs must first enter into a contract or cooperative agreement providing assurances of the availability of adequate hazardous waste treatment or disposal capacity. EPA recognizes that state hazardous waste systems are dynamic and that factual

information and assumptions upon which a state's CAP is based may change. Therefore, before a contract or cooperative agreement is signed, the state must ensure that its CAP and the commitments contained therein are current. This concept, known as CAP maintenance, is important to ensure that CAP planning remains a dynamic process. States can demonstrate that their CAPs and the commitments contained therein are current by meeting their milestones for addressing shortfalls. Hence, states must assure that their milestones are current before a contract or cooperative agreement is signed. States should meet at least one milestone per year. Missed milestones could result in the denial of new remedial funding. (See discussion on milestones in Chapter 4 of the Guidance.)

1.2 National Approach to Capacity Assurance Planning

States will use a three-phased approach for the 1993 CAP process to assure the availability of adequate hazardous waste management capacity. The approach includes (1) an initial national-level determination of shortfalls by management capacity; (2) if shortfalls exist, waste minimization projections along with information concerning permitted but not operational capacity and capacity with draft permits from states that have a demand exceeding their supply of capacity in a shortfall management category; and (3) if shortfalls still exist, further state planning by "shortfall states" to alleviate any remaining national shortfalls. Exhibit 1-1 illustrates the 1993 national capacity assurance approach. (See also Exhibit 1-2.) (As indicated earlier, EPA does not intend for this process to override or interfere with state requirements or efforts to plan or provide for the management of wastes within that state.)

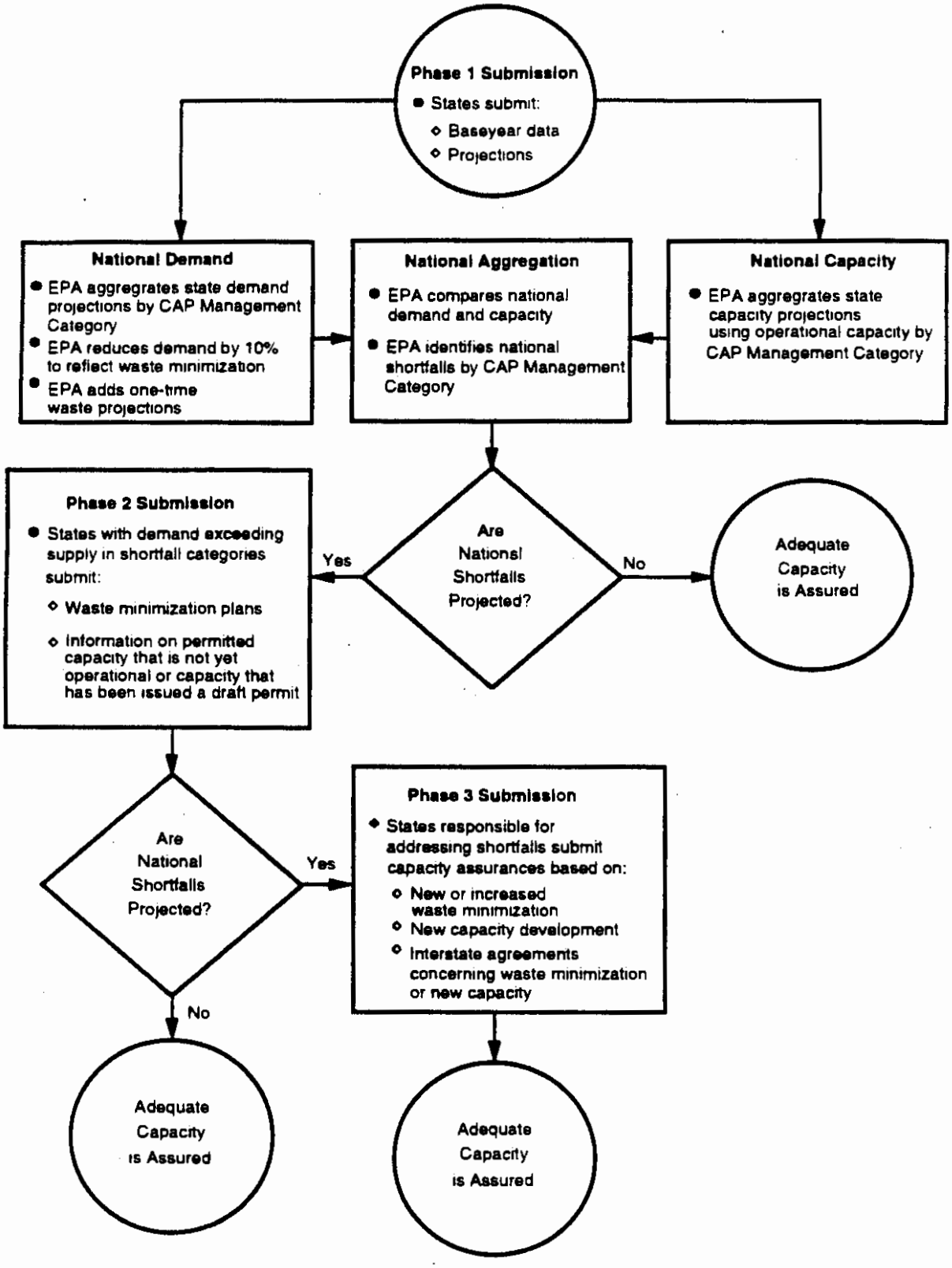
The national approach allocates existing commercial capacity among all states. In previous CAPs, states negotiated interstate agreements to allocate existing capacity. This process resulted in unrealistic "bartering" of existing capacity. For the 1993 CAP process, EPA considers contracts between generators and commercial hazardous waste management facilities, and, between states and commercial hazardous waste management facilities as "interstate agreements or regional agreements or authorities." Interstate agreements among the states will be used only if shortfalls in any management category are identified. Thus, the national approach seeks to address shortfalls through interstate agreements between states to develop waste minimization plans or to develop new capacity and, consequently, removes the "bartering" aspect from interstate agreements.

EPA will allow states to form groups and submit their CAPs on a collective basis. In a collective submittal, each state's capacity and demand data should be presented in each of the individual six CAP Tables as well as collective tables. The data and information presented in the collective CAP submission should be submitted according to the approach presented in this Guidance document. In addition, if states wish their demand and capacity amounts to be considered collective when EPA makes determinations about which states need to address any identified shortfalls, the states should clearly document in the submission that it is a collective submission.

Phase 1

The Phase 1 submittal will consist of baseyear (1991) data and projections of commercial RCRA Subtitle C hazardous waste capacity and demand from recurrent hazardous waste generated in-state. These data and projections will be developed according to the procedures described in Chapters 2 and 3 of this Guidance, respectively. State projections should account for the impact of new regulations based on methods presented in Chapter 3. States will not be responsible for projecting one-time hazardous waste generation. Rather, EPA will develop national one-time waste projections and will aggregate these projections with state recurrent waste projections, as described in Exhibit 1-1. EPA will supply

Exhibit 1-1
National Capacity Assurance Approach



one-time waste estimates to states because many states indicated that estimating one-time wastes is very difficult and time consuming. In addition to addressing these state concerns, EPA believes that by estimating one-time wastes for all states, the projections will be comparable. States will have the opportunity to review EPA's estimates.

In order to satisfy the statute, states must provide hazardous waste demand and capacity supply estimates to assure the availability of capacity for the 20-year period beginning on the date the Superfund remedial action contract or cooperative agreement is signed. For the 1993 projection year, states may project waste generation and management similar to that which occurred in 1991, as described in Chapter 3. EPA believes that 1991 hazardous waste demand and capacity data provide a reasonable approximation of a state's waste management system at the time of CAP submission. (As noted earlier, however, before a contract or cooperative agreement is signed, the state must ensure that its CAP and the commitments contained therein are current.) States should then project hazardous waste demand and capacity for 1999 and 2013 using the process outlined in this Guidance document.

States should also include in their Phase 1 submittal a narrative description of current and planned waste minimization programs, but should not incorporate the effect of these programs into their projections. This data submittal can include information that may have been included in a state's 1989 and 1992 CAP submittals, e.g., information on any legislative authority that exists for current or potential waste minimization efforts and a description of the program. If information in these areas has not changed since submission of its 1989 and 1992 CAPs, a state can simply refer back to the appropriate CAP.

This information will be available to all interested parties. It should be useful for states interested in starting or augmenting waste minimization programs, to see what others have accomplished, and possibly to model future programs on state "success stories." Detailed waste minimization analyses will be necessary only if a state needs to address shortfalls during Phase 2 or 3 of the CAP process (see Chapter 4).

As stated earlier, the capacity assurance planning process is a continuing planning effort. As such, before a state can plan for another 20 years, EPA believes that the state should examine previous planning assumptions and factual information to see if they remain valid today. Therefore, Phase 1 submittals should include a discussion that reflects an understanding of significant changes between the last two CAPs (1989 and 1992) and the 1993 CAP. This discussion may be qualitative, focusing on general trends in a state's hazardous waste management system.

National Aggregation of Demand and Capacity

After states deliver their Phase 1 submittal, EPA's Office of Solid Waste (OSW) will conduct a capacity assessment based on state submitted data to determine whether sufficient hazardous waste management capacity exists nationwide for the 20th year, 2013. OSW will identify any national shortfalls in management capacity on a management category-specific basis. Shortfalls will be identified by comparing total projected national demand to the total projected national capacity for each CAP Management Category. (See Chapter 2 for a description of the CAP Management Categories.)

OSW will determine total national demand by CAP Management Category for 2013 by taking the following steps:

(1) Aggregating state projected demand from recurrent waste;

(2) Reducing this sum by 10 percent to reflect and recognize ongoing waste minimization efforts; and

(3) Adding estimates of demand on commercial hazardous waste management capacity due to one-time waste generation.

While OSW aggregates the data, EPA Regional offices will review the Phase 1 submittal for accuracy and completeness. If an EPA Regional office determines that the data contained in a CAP are either inaccurate or incomplete, the state will be notified and requested to provide additional information. EPA is willing to work with the state to improve and/or complete these data. If a state fails to provide the requested additional information by the due date for the Phase 1 submission, however, the EPA Headquarters and Regional offices will work together to obtain this additional information. If the Agency must complete this additional information, the information will be considered final and not subject to negotiation because completing the national aggregation in a timely manner requires the Agency to have a final set of numbers early in the aggregation process.

In the event that any state does not deliver a Phase 1 CAP submittal, OSW will work with the EPA Regional offices to develop demand and capacity projections for these states so that there will be no missing data for the national assessment. These projections will be based on data from the Biennial Reporting System, RCRA Subtitle C permits, and other sources of information. EPA, however, encourages states to prepare their own Phase 1 submittals because, as explained earlier, one of the main purposes of capacity assurance planning is for states themselves to engage in a hazardous waste management planning exercise. Also, it is important for states to realize that any Phase 1 submittals that are developed by the Agency will be considered final and not subject to negotiation with the states.

The 10 percent reduction listed in step 2 above will adjust national demand projections for recurrent wastes to take into account both the ongoing waste minimization activities described in the states' Phase 1 submittals and industry's efforts in this area, irrespective of state activities. It is a conservative adjustment intended only to determine the existence of national shortfalls or surpluses in hazardous waste management capacity. In Phase 2 or 3, this 10 percent reduction will be applied only to wastes from states that do not

submit Phase 2 or Phase 3 waste minimization plans. Other states, which address shortfalls in Phase 2 or 3 through waste minimization planning resulting in waste reduction greater than 10 percent, should support their estimated reductions with adequate documentation, as described in Chapter 4.

EPA will be responsible for providing an estimate of the future generation of one-time wastes and will provide these estimates to each state for its review. States can work with EPA to adjust these data if necessary. EPA will send its one-time waste estimates to the highest ranking official of the state agency with the responsibility for preparing the 1993 CAP. EPA's methodology for developing the one-time waste estimates will also be enclosed for review. States should inform EPA whether they agree with the one-time waste estimates. Responses should be forwarded to:

Chief
Capacity Programs Branch, OS-321W
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

ATTN: Response to CAP One-time Waste Estimates Enclosed

If a state disagrees with EPA's estimates, it should include in its response to EPA its own estimates of one-time waste generation and provide a detailed explanation of the differences in the estimates. The Agency will work with the states submitting new one-time waste information to develop an accurate projection of the one-time waste universe. If EPA does not receive a response from the state, EPA will assume that the state agrees that EPA's estimates are valid for the national aggregation.

Once the national aggregation demand has been calculated, OSW will determine the maximum commercial capacity available nationwide by aggregating each state's maximum capacity projected for 2013 by CAP Management Category. For Phase 1, EPA will aggregate only existing operational capacity. OSW will work with EPA Regional offices and states to ensure that all existing operational capacity has been counted and will adjust reported capacity figures as necessary to make them more accurate. States will not be required to demonstrate the capacity for hazardous wastes managed in on-site and captive facilities. Rather, OSW will assume that the capacity needed to manage these hazardous wastes will continue to be available in future years.

OSW will then compare projected national demand to total existing capacity by CAP Management Category for the year 2013 to identify any national shortfalls. If, in its national aggregation, EPA determines that there are no national shortfalls for any of the CAP Management Categories, then all states will receive CAP approval. If the national aggregation of projected demand and capacity identifies national shortfalls in any CAP Management Category, each state that does not have sufficient in-state capacity to manage its wastes in each shortfall CAP Management Category should prepare a Phase 2 CAP submittal. States that have sufficient in-state capacity in each management category will not be required to prepare a Phase 2 submittal and will be eligible to have its CAP approved.

ATTACHMENT: Public Participation

This attachment explains in greater detail why and how the Agency encourages public involvement in the development of hazardous waste management plans.

One of the Agency's goals in developing the 1993 CAP approach has been to involve the public regarding issues related to hazardous waste management practices and the development of hazardous waste management plans. The Agency's experience has shown that when the public, and in particular local citizens are involved early and often in the decisionmaking for environmental programs, the programs can be enhanced, rather than impeded.

To ensure adequate public participation in the CAP process, EPA encourages public participation at both the national and state levels. EPA's activities will include publication of Federal Register notices describing the results of the national assessment and the identification of shortfall states and fact sheets containing similar information. Other EPA programs related to CAP, such as the Superfund program, the RCRA-permitting process, and the Biennial Reporting System, actively solicit public involvement in their program development.

State policy makers are strongly encouraged to conduct outreach activities such as distributing information, providing opportunities for public comment and holding open meetings to discuss with all concerned parties the results of their analyses of the state's hazardous waste management system and proposed future activities reflected in management plans. The Agency believes that public participation efforts at the state level are most important when states are developing strategies related to hazardous waste management capacity development. Hence, states should make every effort to inform constituents about the proposed commitments within the Phase 3 portion of their CAPs.

Finally, the Agency recognizes that many states currently have their own administrative processes that provide the public with the opportunity to be involved with hazardous waste management planning. EPA is ready to work with the states to assist them in these efforts.

Phase 2

If adequate capacity exists nationwide for all CAP Management Categories, EPA will not require Phase 2 CAP submittals from any state. If a national shortfall is projected for any CAP Management Category, however, each state that does not have sufficient in-state commercial capacity in the shortfall category should submit Phase 2 CAP projections. EPA will notify states in writing of the need to submit Phase 2 CAP projections.

In Phase 2, states that have insufficient capacity in the identified shortfall management category(ies) should project how waste minimization efforts will reduce the demand for commercial capacity in the shortfall categories. In addition, the Phase 2 submission should identify any additional Subtitle C commercial capacity in the shortfall categories, specifically permitted capacity that is not yet operational and capacity for which a draft permit has been issued. States should submit milestones for waste minimization projections and progress in the operational status of permitted capacity or in permitting new capacity. If there is a projected national shortfall, many, if not all, waste minimization milestones contained in the 1989 CAPs could become milestones in Phase 2 of the 1993 CAP.

States may also negotiate interstate agreements for collective waste minimization plans and include these agreements in their projections. States participating in interstate agreements for waste minimization will be responsible for meeting milestones and should provide EPA with appropriate documentation as described in section 4.2. These agreements are described in more detail in sections 4.2 and 4.4.

EPA Regional offices will track state milestones to determine state progress made in eliminating shortfalls. These waste minimization projections and commercial capacity figures should comply with the requirements described in Chapter 4 of this Guidance document. After receiving the Phase 2 information, EPA will apply the waste minimization and capacity data to the shortfall amount for each shortfall CAP Management Category and will determine whether shortfalls still remain in any CAP Management Categories.

The Agency encourages states with sufficient capacity in the identified shortfall management category(ies) in Phase 2 to also submit information describing how their waste minimization efforts will reduce the demand for commercial capacity in the shortfall categories. The Agency encourages these states to also identify any additional Subtitle C commercial capacity that is permitted but not yet operational and capacity for which a draft permit has been issued. This information will provide the Agency with a more complete picture of the waste minimization and siting efforts that are underway and, more importantly, may prevent shortfalls from being identified in Phase 3, requiring unnecessary siting of new facilities.

States that prepare Phase 2 submittals voluntarily should also establish milestones to allow the Agency to track progress made in eliminating shortfalls. The Agency would like these states to maintain their milestones, and therefore periodically update them to ensure that the goals expressed are reasonable.

Phase 3

If adequate capacity exists nationwide for all CAP Management Categories after Phase 2, EPA will not request Phase 3 CAP submittals from any states. If national shortfalls are still projected for any CAP Management Category, each state that EPA identifies as a "shortfall state" for that category should address its portion of the national shortfall amount (see Chapter 4). In Phase 3, a shortfall state is a state that meets both of the following criteria: (1) its projected demand is greater than its projected supply in the shortfall category; and (2) its projected aggregate demand for commercial incineration and land disposal is greater than its projected supply of such capacity. EPA will notify states in writing of the need to prepare Phase 3 submittals. States that are not identified by EPA as contributing to the shortfall will not be requested to prepare a Phase 3 CAP submittal.

States can address shortfalls in Phase 3 through increased waste minimization, development of new capacity, and/or interstate agreements. As in Phase 2, states participating in interstate agreements for waste minimization will be responsible for meeting individual state milestones and for providing EPA with appropriate waste minimization documentation as described in section 4.2. The Phase 3 CAP submittal should address all identified shortfalls and should provide milestones through which needed capacity will be developed. If a state that has been identified as having to address a shortfall category in Phase 3 fails to deliver an adequate Phase 3 CAP submission to EPA by the due date, then new Superfund remedial action funding will be withheld from that state. Furthermore, if a state does not progress toward eliminating its shortfalls and misses Phase 3 milestones, new Superfund remedial action funds could be withheld. Milestones will be tracked by the EPA Regional offices. If there is a projected national shortfall, many if not all siting milestones in the 1989 CAPs could become milestones in Phase 3 of the 1993 CAP.

Hazardous Waste Included in CAP

The scope of 1993 CAPs has been changed somewhat from earlier CAPs to explicitly exclude or include certain types of waste.

For the 1993 CAPs, states should report on the following types of waste:

- Subtitle C hazardous waste, including waste from federal facilities, unless omitted below; and
- Non-RCRA Subtitle C hazardous waste that is considered hazardous under state regulations and is managed in hazardous waste management systems.

For the baseyear, data should be presented for on-site, captive, and commercial facilities, while only commercial facility data will be presented for projections.

For the 1993 CAPs, states do not have to report the generation and/or management of the following types of wastes:

- Waste generated by small quantity generators (SQGs);
- Non-RCRA Subtitle C waste that may use Subtitle C hazardous waste management capacity, except for waste considered hazardous under state regulations that is managed in Subtitle C hazardous waste management systems;
- Waste disposed through discharge to sewers or publicly owned treatment works (POTWs);
- Waste disposed through direct discharge to surface waters under the National Pollutant Discharge Elimination System (NPDES);
- Mixed hazardous/radioactive wastes; and
- Projections of one-time waste generation.

This Guidance document describes the minimum requirements that states should meet to satisfy CERCLA §104(c)(9). States should assure commercial capacity for all wastes placing demand on commercial systems, as indicated in their CAP tables. States may, if they desire, prepare CAPs that have a broader scope. For example, states that want to present data for exempt management systems treating hazardous wastes and for management of wastes not required to be presented in CAP tables have the option to do so for informational purposes. States should provide EPA with this additional information in a separate table or describe the additional data in the text of their CAPs.

EPA will determine if the 1993 CAPs are acceptable based on this Guidance. Letters of self-certification and other partial CAP submittals which do not provide sufficient data will be considered unacceptable and may put a state's remedial action funding in jeopardy.

The States' Assurance of Capacity

As stated earlier, when enacting CERCLA §104(c)(9), Congress did not provide specific language regarding the nature of state capacity assurances; instead it required that EPA deem the assurances adequate. The basis for evaluating a state's assurance includes:

- The Phase 1 submittal;
- The national aggregation; and
- The state's commitment to taking the actions necessary to ensure the availability of adequate capacity pursuant to the Phase 2 and 3 CAP submittals, if required.

Every time a state enters into a Superfund remedial action contract or cooperative agreement, it must assure capacity. EPA will evaluate, on a case-by-case basis, the adequacy of that assurance using the criteria just described. The following language should appear in the contract or cooperative agreement:

The state has submitted its capacity assurance plan to EPA. EPA deemed this capacity assurance plan adequate, pursuant to 40 CFR 35.6105(b)(3) and the letter from [insert US EPA representative's name] to [insert state representative's name] dated [insert date of approval letter]. The state hereby assures the availability of hazardous waste treatment or disposal facilities for the next 20 years, following signature of this agreement, pursuant to CERCLA §104(c)(9).

Public Participation

Given the public's concern about the management of hazardous waste in their communities, EPA encourages states to involve the public in the planning for the three phases of the CAP submittal. EPA encourages state policy makers to hold open meetings to discuss with all concerned parties the results of their analyses of the state's hazardous waste management system. EPA is willing to work with the states to assist them in these efforts.

1.3. CAP SUBMITTAL

Phase 1 Submittal

The Phase 1 submittal should be collated into a single document entitled "1993 Hazardous Waste Capacity Assurance Plan for [State, Commonwealth, Territory]: Phase 1." The highest ranking official of the state agency that is responsible for preparing the 1993 CAP should deliver the Phase 1 submittal with a signed cover letter to the EPA Regional Administrator by the due date. The original and one copy of these materials should be sent to each state's EPA Regional office. Also send one copy to the following address for EPA's Office of Solid Waste (OSW):

Chief
Capacity Programs Branch, OS-321W
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

ATTN: Phase 1 Capacity Assurance Submittal Enclosed

EPA has made available to each state a diskette containing the CAP table formats in Wordperfect 5.1. Any State that has not obtained a diskette and would like one, can obtain one from the above address. To increase the ease of aggregating the data, EPA requests that states also submit their data on a 3½" or 5¼" computer diskette to the above address for OSW. A suggested transmittal letter for the Phase 1 submittal follows.

Dear Regional Administrator:

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (42 U.S.C. §9604(c)(9)), requires as a condition for providing remedial action funding that states assure the availability of treatment and disposal facilities that have the capacity to treat, destroy, or securely dispose of the waste reasonably expected to be generated within their borders for 20 years. The accompanying document provides a basis for you to evaluate the assurances of [State, Commonwealth, Territory] to be contained in a contract or cooperative agreement that will incorporate this document by reference.

The attached Phase 1 document demonstrates that [State, Commonwealth, Territory] has described its current hazardous waste management system, including ongoing waste minimization program activities; has projected the demand for commercial hazardous waste management capacity from recurrent hazardous waste generated in [State, Commonwealth, Territory] for the next 20 years; and has projected the commercial hazardous waste management capacity available within [State, Commonwealth, Territory] for the next 20 years. I certify that this information is accurate, complete, and has been developed in good faith.

I hereby transmit this document, which, in addition to any Phase 2 and Phase 3 capacity assurance planning documents that may be required to address shortfalls in national capacity, will form the basis for the assurances required of [State, Commonwealth, Territory] under 42 U.S.C. §9604(c)(9).

Sincerely yours,

[Ranking Official]
[State Agency]
[State, Commonwealth, Territory]

Phase 2 CAP Submittal

All states that project a demand greater than their in-state operational capacity for a CAP Management Category that EPA has identified as a national shortfall category should prepare a Phase 2 CAP submittal. The Phase 2 CAP submittal should be collated into a single document entitled "1993 Hazardous Waste Capacity Assurance Plan for [State, Commonwealth, Territory]: Phase 2." The Governor of each state (or his/her designee) should deliver the Phase 2 CAP submittal with a signed cover letter to the EPA Regional Administrator. The original and one copy of these materials should be sent to each state's EPA Regional office. Also send one copy to the following address for OSW:

Chief
Capacity Programs Branch, OS-321W
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

ATTN: Phase 2 Capacity Assurance Plan Submittal Enclosed

A suggested transmittal letter for the Phase 2 CAP submittal follows:

Dear Regional Administrator:

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (42 U.S.C. §9604(c)(9)), requires as a condition for providing remedial action funding that states assure the availability of treatment and disposal facilities that have the capacity to treat, destroy, or securely dispose of the waste reasonably expected to be generated within their borders for 20 years. In addition to a previously submitted Phase 1 document, the accompanying Phase 2 document provides a basis for you to evaluate the assurances of [State, Commonwealth, Territory] to be contained in a contract or cooperative agreement that will incorporate these documents by reference.

The attached Phase 2 capacity assurance planning document demonstrates that, for the shortfall CAP Management Categories identified by EPA, [State, Commonwealth, Territory] has described its waste minimization projections along with information about capacity that is permitted but not operational and capacity for which a draft permit has been issued. I certify that this information is accurate, complete, and has been developed in good faith. In accordance with similar agreements on behalf of other state governments, I agree to achieve the goals presented as milestones in the Phase 2 submission so that the national use and demand for these hazardous waste management facilities will be reduced accordingly.

I hereby transmit this document, which, in addition to the Phase 1 document already submitted and any Phase 3 capacity assurance documents that may be required, will form the basis for the assurances required of [State, Commonwealth, Territory] under 42 U.S.C. §9604(c)(9).

Sincerely yours,

[Governor or designee]
[State Agency]
[State, Commonwealth, Territory]

Phase 3 CAP Submittal

Any state identified by EPA as a "shortfall" state after the Phase 2 reassessment of national capacity should prepare a Phase 3 CAP submittal. The Phase 3 CAP submittal should be collated into a single document entitled "1993 Hazardous Waste Capacity Assurance Plan for [State, Commonwealth, Territory]: Phase 3." The Governor of each state (or his/her designee) should deliver the Phase 3 CAP submittal with a signed cover letter to the EPA Regional Administrator. The original and one copy of these materials should be sent to each state's EPA Regional office. Also send one copy to the following address for OSW:

Chief
Capacity Programs Branch, OS-321W
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

ATTN: Phase 3 Capacity Assurance Plan Submittal Enclosed

A suggested transmittal letter for the Phase 3 CAP submittal follows:

Dear Regional Administrator:

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (42 U.S.C. §9604(c)(9)), requires as a condition for providing remedial action funding that states assure the availability of treatment and disposal facilities that have the capacity to treat, destroy, or securely dispose of the waste reasonably expected to be generated within their borders for 20 years. In addition to previously submitted Phase 1 and 2 documents, the accompanying Phase 3 document provides a basis for you to evaluate the assurances of [State, Commonwealth, Territory] to be contained in a contract or cooperative agreement that will incorporate these documents by reference.

The attached Phase 3 capacity assurance planning document demonstrates that [State, Commonwealth, Territory] has addressed all shortfalls in capacity to which [State, Commonwealth, Territory] is projected to contribute demand over the next 20 years. In addition, I agree to achieve the goals presented as milestones in the Phase 3 submission so that the national shortfall will be reduced accordingly.

I hereby transmit this document, which, in addition to the Phase 1 and Phase 2 documents already submitted, will form the basis for the assurances required of [State, Commonwealth, Territory] under 42 U.S.C. §9604(c)(9).

Sincerely yours,

[Governor or designee]
[State Agency]
[State, Commonwealth, Territory]

1.4 CAP REVIEW PROCESS

Both EPA Regional offices and EPA Headquarter's Office of Solid Waste (OSW) have roles in the CAP review process. EPA Regional offices have detailed knowledge of the states and their capacity assurance planning efforts. For this reason, EPA Regional Administrators will be the primary decisionmakers in the CAP review process who will evaluate the accuracy and completeness of CAP submittals. OSW will focus on national consistency, national policy, and other CAP issues that cut across Regional boundaries. OSW will also have primary responsibility for aggregating demand and capacity projections to identify any shortfalls in national capacity. Exhibit 1-2 illustrates the CAP review process.

Review of the Phase 1 Submittal

EPA will review the Phase 1 submittal in the following stages:

(1) Completeness review of Phase 1 submittal (Regions);
(2) Full review of Phase 1 submittal (Headquarters and Regions);
(3) National aggregation of projected demand and capacity (Headquarters);
(4) Phase 1 CAP consistency meeting (Headquarters and Regions); and
(5) Notification of shortfalls or approval (Headquarters and Regions).

Completeness Review of Phase 1 Submittal

Regardless of a state's approval status for any previous CAP submittal (i.e., 1992 or 1989 CAP), the EPA Regional office for the state will review the Phase 1 submittal to see that it contains all the components listed below:

✓ Transmittal letter signed by the highest ranking official of the state agency that is responsible for preparing the 1993 CAP;

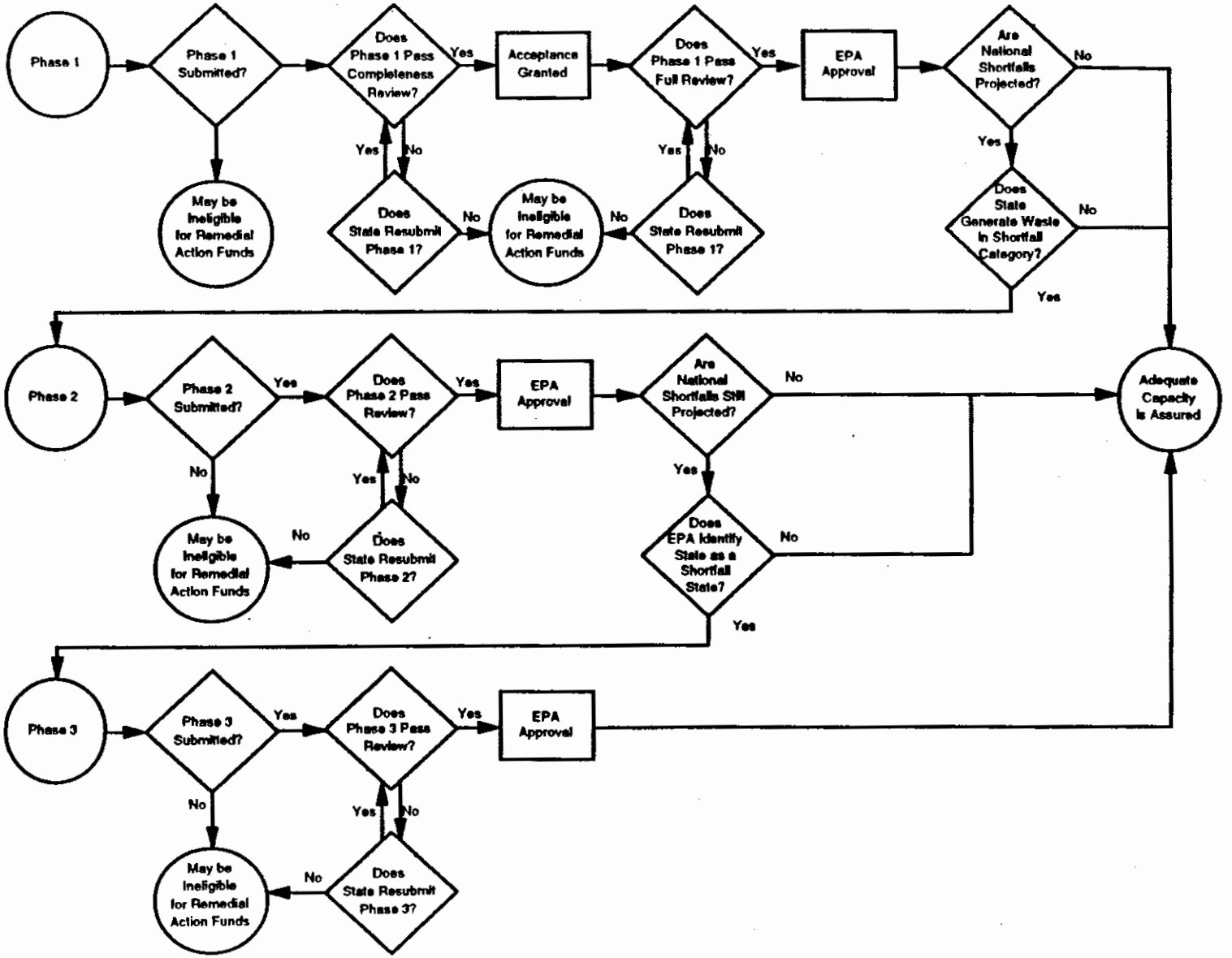
✓ Baseyear 1991 description of the state's hazardous waste management system, as described in Chapter 2 of this Guidance;

✓ Narrative description of current waste minimization program activities (e.g., state, industry, trade association efforts);

✓ Projections of the demand for commercial hazardous waste management capacity from hazardous waste generated in the state in 1993, 1999, and 2013, as described in Chapter 3 of this Guidance; and

✓ Projections of the supply of commercial Subtitle C hazardous waste management capacity available within the state in 1993, 1999, and 2013, as described in Chapter 3 of this Guidance.

Exhibit 1-2
CAP Review Process



If the document is determined to be complete, the state will be notified by EPA that its CAP has been accepted. Under acceptance status, states will be considered to have met the requirements for receiving new Superfund remedial action funding provided its previous CAP submittals (1989 and 1992) are still approved. Any state that is scheduled to enter into an agreement with EPA for new Superfund remedial action funding during the initial completeness review period will be given priority for review of its Phase 1 submittal.

If the Phase 1 submittal does not contain the above components, the state will be notified by its EPA Regional Administrator in writing, immediately upon discovery of the incompleteness, that its CAP is not complete and what additional information needs to be provided within a designated timeframe. If a state does not deliver a Phase 1 submittal by the specified due date, the EPA Regional Administrator will formally acknowledge in a letter the state's failure to deliver a Phase 1 submittal and will outline the consequences.

Full Review of Phase 1 Submittal

After the Phase 1 submittals have been reviewed for completeness, EPA Regional offices will conduct a more thorough technical review of baseyear demand and capacity data and projection year methods and results in accordance with the review criteria described in Chapter 3. This evaluation will also include a review of each state's description of its ongoing and planned waste minimization activities. OSW will assist EPA Regional offices, if necessary, to review technical components of the submittal. EPA Regional offices will attempt to reconcile any problems with a state's Phase 1 submittal by working directly and informally with the state. Significant problems with or questions about the Phase 1 submittal will be addressed in a CAP consistency meeting of EPA Regional CAP Coordinators, as described later.

National Aggregation of Projected Demand and Capacity

While the EPA Regional offices complete the technical review of the Phase 1 submittal, OSW will compile the data contained in these submittals and the results of EPA's national study of one-time waste generation. Before aggregating these quantities, OSW will reduce the projected demand for recurrent wastes by 10 percent to reflect assumed waste minimization. This information will be used to determine if national shortfalls in commercial hazardous waste management capacity are projected for 2013. If, during their technical review of the Phase 1 submittal, EPA Regional offices identify any discrepancies with the data submitted, they will notify OSW (and vice versa).

OSW will determine the maximum commercial capacity available nationwide by aggregating each state's maximum capacity projected for 2013 by CAP Management Category. To develop the most accurate portrayal of commercial capacity available nationwide, OSW will work with EPA Regional offices and states to ensure that all capacity has been counted, and will adjust national capacity figures as necessary. In the event that any states do not deliver a Phase 1 submittal, OSW will work with EPA Regional offices to develop demand and capacity projections for these states for the purposes of national assessment. These projections will be based on data from the Biennial Reporting System, RCRA Subtitle C permits, and other sources of information. OSW will then compare projected national demand to maximum available capacity by CAP Management Category in 2013 to identify any national shortfalls.

Phase 1 CAP Consistency Meeting

After EPA Regional offices have completed their technical review of the Phase 1 submittals and OSW has completed the national capacity assessment, OSW will arrange a meeting of all EPA Regional CAP Coordinators to ensure that the CAPs have been evaluated consistently. At this meeting, the Coordinators will discuss their concerns about the Phase 1 submittal with each other and OSW staff, and will recommend nationally consistent decisions about how to address these concerns. The results of the national aggregation of projected demand and capacity will also be presented and discussed during the CAP consistency meeting. Individual states will be notified in writing after this meeting if there are any areas in their Phase 1 submittal that need to be addressed. Failure to address these concerns could result in withdrawal of the initial CAP acceptance and eligibility for new funding of remedial actions.

Notification of Shortfalls or Approval

EPA will report the results of the national aggregation of projected demand and capacity to the states. If this analysis does not identify national shortfalls for any CAP Management Category, then all states will receive final CAP approval. If the analysis identifies national shortfalls in any of the CAP Management Categories, EPA will notify those states that should address the shortfall during Phase 2 (see method in Chapter 4). States that do not have to address shortfalls do not have to submit a Phase 2 CAP submittal, and will have final CAP approval. EPA's process for reviewing the Phase 2 CAP submittal is described below.

Review of the Phase 2 CAP Submittal

If the national aggregation of projected demand and supply of capacity identifies national shortfalls in any CAP Management Category, EPA will identify those states that generate wastes that are managed in the shortfall categories and do not have sufficient in-state capacity for managing such wastes. These states should prepare Phase 2 CAP submittals that address only shortfall CAP Management Categories in which the state does not have sufficient capacity. States will be notified of projected shortfall management categories identified by EPA.

The review process for the Phase 2 CAP submittal is similar to the review process for the Phase 1 submittal. If a shortfall state does not deliver a Phase 2 CAP submittal, the state will not be considered to have satisfied the requirements necessary for receiving new Superfund remedial action funding, regardless of the state's approval status for any previous CAP submittal (i.e., Phase 1 1993, 1992, or 1989 CAP). If a state has not delivered the Phase 2 CAP submittal within 30 days of the due date, the EPA Regional Administrator will formally acknowledge in a letter the state's failure to deliver a Phase 2 CAP submittal and will outline the consequences. A state that delivers its Phase 2 submission within the required timeframe will continue to be eligible to receive new Superfund remedial action funding, pending review of the Phase 2 submission, provided that its Phase 1 submittal has been approved.

EPA will review the Phase 2 CAP submittal in the following stages:

(1) Review of compliance with any remaining Phase 1 concerns (Regions);

(2) Review of Phase 2 CAP submittal (Regions and Headquarters);

(3) Revised national aggregation of projected demand and capacity (Headquarters);

(4) Phase 2 CAP consistency meeting (Headquarters and Regions); and

(5) Notification of approval/disapproval and identification of remaining shortfalls and states that should submit Phase 3 CAPs (Headquarters and Regions).

Review of Compliance with Remaining Phase 1 Concerns

Any issues raised concerning a state's Phase 1 submittal should be fully resolved before the EPA Regional office will consider that state's Phase 2 submittal for technical review. At the latest, states should deliver their revised Phase 1 submittal when the Phase 2 CAP is due.

Review of Phase 2 CAP Submittal

EPA Regional offices and OSW will review the methods used by a state for addressing shortfalls in Phase 2 CAPs. EPA Regional offices and OSW will conduct this review in accordance with the review criteria for waste minimization and development of new capacity (i.e., capacity that is permitted capacity but not yet operational and capacity for which a draft permit has been issued) as described in Chapter 4 of this Guidance. EPA Regional offices will also review milestones submitted for waste minimization goals and permitted capacity progress. OSW will assist EPA Regional offices, if necessary, to review more technical components of the submittal (e.g., planned waste minimization efforts). EPA Regional offices will attempt to reconcile any minor problems with a state's Phase 2 CAP submittal by working directly and informally with the state. The Phase 2 CAP submittal will be discussed in a CAP consistency meeting of EPA Regional CAP Coordinators and OSW, as described in a later section.

Revised National Aggregation of Projected Demand and Capacity

While the EPA Regional offices complete the technical review of the Phase 2 submittals, OSW will compile the waste minimization projections, data pertaining to capacity that is permitted but not yet operational, and data for capacity with draft permits contained in these submittals. OSW will analyze the data to determine whether national shortfalls in commercial hazardous waste management capacity are still projected for 2013. If, during the technical review of the Phase 2 submittal, EPA Regional offices identify any discrepancies with the data submitted, they will notify OSW (and vice versa).

OSW will determine a revised total national demand for shortfall categories by subtracting the waste minimization projections from the total national demand estimated

during the review of the Phase 1 submittal. These new waste minimization projections will be used in place of the 10 percent reduction considered during Phase 1. For states that do not prepare Phase 2 submittals, OSW will continue to assume a 10 percent reduction. OSW will determine the revised maximum commercial capacity available nationwide in the shortfall CAP Management Categories by adding the Phase 2 submittal on capacity that is permitted but not yet operational or that has a draft permit to the Phase 1 submittal on operational capacity. To develop the most accurate portrayal of commercial capacity available nationwide, OSW will work with the EPA Regional offices and states to ensure that all capacity has been counted, and will adjust national capacity figures as necessary.

In the event that any states do not deliver a Phase 2 submittal, OSW will work with EPA Regional offices to develop capacity projections for these states for the purposes of the national assessment. These projections will be based on data from RCRA permits and other sources of information. OSW will then compare projected national demand after incorporation of future waste minimization plans from states to adjusted maximum available capacity for the shortfall CAP Management Categories in 2013. OSW will identify if national shortfalls still exist. States that should submit a Phase 2 submittal but do not do so will be jeopardizing their eligibility to receive new remedial action funding.

Phase 2 CAP Consistency Meeting

After EPA Regional offices and OSW have reviewed the Phase 2 CAP submittals and OSW has completed the revised national capacity assessment, OSW will arrange a meeting of all EPA Regional CAP Coordinators and OSW staff to ensure that the CAPs have been evaluated consistently. At this meeting, the Coordinators and OSW will discuss the Phase 2 CAP projections and milestones and will recommend nationally consistent decisions concerning the submittals. If necessary, technical experts will also attend the meeting to address questions about the appropriateness of particular methods or assumptions used by states in their Phase 2 CAP submittal.

Notification of Approval/Disapproval

EPA will report the results of the revised national aggregation of projected demand and capacity to the states. If this analysis does not identify continuing shortfalls, then all states that were required to submit Phase 2 will receive final CAP approval. If the analysis identifies remaining national shortfalls, EPA will notify those states that should address the shortfall during Phase 3. If a state's Phase 2 CAP submittal is not approved, EPA Regional Administrators will notify states in writing of the requirements for the state to gain approval. Failure to address these concerns could result in the denial of disbursement of new Superfund remedial action funding.

Review of the Phase 3 CAP Submittal

If the national aggregation of projected demand and supply of capacity in Phase 2 identifies remaining national shortfalls in any CAP Management Category, EPA will identify "shortfall states" according to the methodology presented in Chapter 4. Shortfall states should assure adequate capacity for those CAP Management Categories through a Phase 3 CAP submittal. The Phase 3 CAP submittal should address only CAP Management

Categories for which the state has been identified as a shortfall state. The Phase 3 CAP submittal will be due to EPA after EPA distributes a letter to the states with the results of the national aggregation of projected demand and capacity from Phase 2 and with the identification of shortfall states.

The review process for the Phase 3 CAP submittal is similar to the review process for the Phase 2 submittal. If a shortfall state does not deliver a Phase 3 CAP submittal, the state will not be considered to have satisfied the requirements necessary for receiving new Superfund remedial action funding, regardless of the state's approval status for any previous CAP submittal (i.e., Phase 2 1994, Phase 1 1993, 1992, or 1989 CAP). If a state has not delivered the Phase 3 CAP submittal within 30 days of the due date, the EPA Regional Administrator will formally acknowledge in a letter the state's failure to deliver a Phase 3 CAP submittal and will outline the consequences. A state that delivers its Phase 3 submission within the required timeframe will be continue to be eligible to receive new Superfund remedial action funding, pending review of the Phase 3 submission, provided that its prior CAP submittals have been approved.

EPA will review the Phase 3 CAP submittal in the following stages:

(1) Review of compliance with any remaining Phase 2 concerns (Regions);
(2) Review of Phase 3 CAP submittal (Headquarters and Regions);
(3) Phase 3 CAP consistency meeting (Headquarters and Regions); and
(4) Notification of approval/disapproval (Headquarters and Regions).

These stages are consistent with the corresponding stages for the Phase 2 submittal, as described previously.

Ongoing Review of Phase 2 and 3 Milestones

An important part of the Phase 2 and 3 CAP submittals involves establishing milestones, subject to approval by EPA Regional offices, to address shortfalls, as described in Chapter 4 of this Guidance. EPA Regional offices will monitor the states' progress in achieving these milestones. Failure to achieve the milestones may result in the withdrawal of CAP approval and denial of disbursement of new Superfund remedial action funding unless milestones are revised, as approved by EPA and discussed in Chapter 4. States with Phase 2 and 3 milestones will need to maintain their CAPs to ensure that milestones are being met and are updated or revised, if necessary. States should maintain current information in CAPs so that when capacity becomes available or unavailable and generation increases or decreases substantially due to facility openings or closings, these capacity changes are acknowledged and reported to the EPA Regions.

2. PHASE 1: BASEYEAR

2.1 INTRODUCTION TO BASEYEAR DATA

Introduction

This chapter provides guidance to states on reporting the demand for on-site, captive, and commercial Subtitle C hazardous waste management systems in the baseyear (1991). This chapter also provides guidance on reporting maximum operational capacity for commercial Subtitle C hazardous waste management systems in the baseyear. Further guidance is available, under separate cover, concerning how states can use data from the Biennial Reporting System (BRS) and related software to help prepare the baseyear and projection tables. (See USEPA, Using Tabletalk To Prepare CAP Tables, October 1992).

The year 1991 is the baseyear for the 1993 CAPs because it is the most recent year for which states have collected Biennial Report data. One of the areas that is most crucial to the success of the capacity assurance planning process is the collection of accurate data. As discussed in EPA's FY 92 RCRA Implementation Plan (RIP), EPA is committed to the Biennial Reporting process as the primary data collection tool for states' baseyear CAP data requirements.[1] For most states, 1991 Biennial Report databases will contain the data necessary to prepare the baseyear tables.

Chapter Organization

The remainder of this chapter is organized into two main sections. Section 2.2 introduces the CAP Management Categories that are used in the tables to present the baseyear picture of Subtitle C hazardous waste demand and capacity. Section 2.3 presents the four required baseyear tables: (1) 1991 Hazardous Waste Generated and Managed On Site; (2) 1991 Management of Hazardous Waste in Captive Systems; (3) 1991 Management of Hazardous Waste in Commercial Systems; and (4) Maximum Operational In-state Commercial Subtitle C Management Capacity - End of 1991. Section 2.3 also includes information on transfer facilities, interstate and international hazardous waste imports and exports, mixed hazardous/radioactive wastes, and demand on capacity from recurrent and one-time wastes in 1991.

[1] States are not required, however, to use Biennial Report information as a source of information for their CAPs.

2.2 CAP MANAGEMENT CATEGORIES

States should provide capacity-related information for 14 CAP Management Categories. Management categories were previously referred to as SARA Management Categories in the 1989 CAP *Technical Reference Manual*. Because this terminology implies a statutory definition, EPA has changed the terminology to "CAP" Management Category. The CAP Management Categories are defined in terms of the 1991 Biennial Report System Type codes that correspond to specific types of waste management systems as reported on the Waste Generation and Management (GM), Waste Received From Off Site (WR), and Waste Treatment, Disposal, or Recycling Process Systems (PS) forms. Exhibit 2-1 presents each of the 14 CAP Management Categories with the appropriate System Type codes and narrative descriptions.

EPA developed the CAP Management Categories based on the following criteria:

- Each CAP Management Category is comprised of a number of waste management technologies that are generally interchangeable for managing broad types of wastes (e.g., organics, inorganics including metals, and wastewaters), based on treatment performance. This provides states with the flexibility to identify and investigate alternative management technologies within the CAP Management Category to manage the waste if there is a shortfall in any specific technology. Also, disaggregating systems into more specific and detailed CAP Management Categories has limited value in identifying problematic shortfalls and, consequently, the CAP Management Categories are broadly defined rather than specific to particular technologies.

- CAP Management Categories take into account whether treatment residuals are generated by the waste management technologies and the type of treatment residuals that are generated. Shifts in the demand among recovery or treatment categories that generate residuals may result in changes in the quantity of waste managed in both the relevant treatment or recovery CAP Management Categories and the Stabilization and Landfill CAP Management Categories. Furthermore, the linkage with residuals facilitates future demand projections and analysis of capacity shortfalls. In particular, if a shortfall is projected for landfill capacity, the state should investigate alternative recovery or treatment technologies and waste minimization methods that generate less treatment residuals to reduce the demand on landfills. Thus, states will be encouraged to promote recovery technologies as alternatives to conventional treatment and disposal technologies. For example, for wastes generated within their borders that contain metals, a state could promote metals recovery through waste minimization as an alternative to stabilization followed by land disposal.

- CAP Management Categories are grouped by recovery, treatment, and disposal technologies to reflect a preference for the waste management hierarchy established by Congressional and EPA policy.

- Technologies for treating wastewater and the sludge resulting from wastewater treatment generally are similar (i.e., comprised primarily of treatment tanks) and therefore are consolidated into the Hazardous Wastewaters and Sludges Treatment CAP Management Category. Facilities managing wastewaters and sludges generally have several types of treatments (e.g., chemical oxidation and chemical precipitation). Moreover, many wastewater treatments occur within the same tank, such as cyanide oxidation followed by chromium reduction, chemical precipitation, settling, and sludge dewatering. If demand for a particular type of wastewater or sludge treatment shifts, the facility usually can readily modify its systems to account for changes in demand. For example, wastewater treatment facilities can readily increase chrome reduction by modifying or retrofitting the treatment system to use more tanks.

- The Transfer/Storage CAP Management Category was created because of the difficulties in determining the ultimate disposal of wastes exported to transfer facilities. This category is applicable only for exported waste presented in the baseyear tables.

Two Biennial Report System Type codes are not assigned to a CAP Management Category: M135 Direct discharge to sewer/POTW (no prior treatment); and M136 Direct discharge to surface water under NPDES (no prior treatment). Because these systems manage wastes that are not defined as solid wastes (40 CFR 261.4(a)), they are outside of the scope of the CAPs.

Three System Type codes (i.e., M049 Incineration - type unknown; M059 Energy recovery - type unknown; and M137 Other disposal) are applicable to more than one CAP Management Category; consequently, they are defined under all relevant categories. For these System Type codes, states should use other Biennial Report data (e.g., Form codes) and their knowledge of waste management systems available in state to determine the most appropriate CAP Management Category. States should document the procedures and assumptions used to determine the appropriate CAP Management Category in their Phase 1 CAP submittal.

Exhibit 2-1
CAP Management Categories

RECOVERY

Metals Recovery

M011[a]	High temperature metals recovery
M012	Retorting
M013	Secondary smelting
M014	Other metals recovery for reuse: e.g., ion exchange, reverse osmosis, acid leaching
M019	Metals recovery - type unknown

Inorganics Recovery

M031	Acid regeneration
M039	Other recovery - type unknown

Organics Recovery

M021	Fractionation/distillation
M022	Thin film evaporation
M023	Solvent extraction
M024	Other solvent recovery
M029	Solvents recovery - type unknown
M032	Other recovery: e.g., waste oil recovery, nonsolvent organics recovery

Energy Recovery - Liquids

M051	Energy recovery - liquids
M059	Energy recovery - type unknown

Energy Recovery - Sludges/Solids

M052	Energy recovery - sludges
M053	Energy recovery - solids
M059	Energy recovery - type unknown

[a] System Type codes as defined in: U.S. Environmental Protection Agency, 1991 Hazardous Waste Report Instructions and Forms, EPA Form 8700-13A/B (5-80) (Revised 08-91), OMB #2050-0024, pp. 90-91.

Exhibit 2-1 (continued)
CAP Management Categories

TREATMENT

Stabilization/Chemical Fixation

M111	Stabilization/chemical fixation using cementitious and/or pozzolanic materials
M112	Other stabilization
M119	Stabilization - type unknown

Incineration - Liquids and Gases

M041	Incineration - liquids
M044	Incineration - gases
M049	Incineration - type unknown

Incineration - Sludges/Solids

M042	Incineration - sludges
M043	Incineration - solids
M049	Incineration - type unknown

Fuel Blending

M061	Fuel blending

Hazardous Wastewaters and Sludges Treatment

M071	Chrome reduction followed by chemical precipitation
M072	Cyanide destruction followed by chemical precipitation
M073	Cyanide destruction only
M074	Chemical oxidation followed by chemical precipitation
M075	Chemical oxidation only
M076	Wet air oxidation
M077	Chemical precipitation
M078	Other aqueous inorganic treatment: e.g., ion exchange, reverse osmosis
M079	Aqueous inorganic treatment - type unknown
M081	Biological treatment
M082	Carbon adsorption
M083	Air/steam stripping
M084	Wet air oxidation
M085	Other aqueous organic treatment
M089	Aqueous organic treatment - type unknown
M091	Chemical precipitation in combination with biological treatment

Exhibit 2-1 (continued)
CAP Management Categories

TREATMENT (continued)

M092	Chemical precipitation in combination with carbon adsorption
M093	Wet air oxidation
M094	Other organic/inorganic treatment
M099	Aqueous organic and inorganic treatment - type unknown
M101	Sludge dewatering
M102	Addition of excess lime
M103	Absorption/adsorption
M104	Solvent extraction
M109	Sludge treatment - type unknown
M121	Neutralization only
M122	Evaporation only
M123	Settling/clarification only
M124	Phase separation (e.g., emulsion breaking, filtration) only
M125	Other treatment
M129	Other treatment - type unknown

DISPOSAL

Landfill

M132	Landfill
M133	Surface impoundment (to be closed as a landfill)
M137	Other disposal

Deepwell/Underground Injection

M134	Deepwell/underground injection
M137	Other disposal

Land Treatment/Farming

M131	Land treatment/application/farming
M137	Other disposal

TRANSFER/STORAGE

Transfer/Storage

M141	Transfer facility storage, waste was shipped off site with no on-site treatment, disposal, or recycling (TDR) activity

2.3 BASEYEAR TABLES

As a component of its CAP, each state should demonstrate an understanding of its current Subtitle C hazardous waste generation and management system by providing information on the quantity of Subtitle C hazardous waste exported, imported, and generated and managed in state. States are required to report on RCRA Subtitle C hazardous waste, as specified in Chapter 1, and non-RCRA Subtitle C hazardous waste that is considered hazardous under state regulations and is managed in hazardous waste management systems. The CAP baseyear tables provide a framework for presenting this information. States will use similar tables to report information on projections of future hazardous waste generation and management. States should prepare four baseyear tables:

- Table 1: 1991 Hazardous Waste Generated and Managed On Site;
- Table 2: 1991 Management of Hazardous Waste in Captive Systems;
- Table 3: 1991 Management of Hazardous Waste in Commercial Systems; and
- Table 4: Maximum Operational In-state Commercial Subtitle C Management Capacity - End of 1991.

A copy of each table is provided in this section. Additional copies of the baseyear and projection years tables are provided in Appendix C and on diskette. Along with the tables, states should describe all assumptions and methods that were used to develop the information in the tables, particularly if they differ from that presented in this Guidance document.

Before the instructions for preparing baseyear tables are provided, the following five topics are discussed: (1) transfer facilities; (2) interstate hazardous waste imports and exports; (3) international hazardous waste imports and exports; (4) mixed hazardous/radioactive wastes; and (5) demand on capacity from recurrent and one-time waste in 1991.

Transfer Facilities

Transfer facilities typically receive wastes and then ship these wastes to an off-site waste treatment or recycling facility. Tracking wastes shipped through transfer facilities is problematic for several reasons:

- Double counting occurs when wastes shipped by in-state transfer facilities are included in the total quantity of waste both generated and managed in state and in the total quantity of exported wastes. These

wastes are also reported by the facilities that originally generated the wastes.

- Out-of-state wastes going to transfer facilities are erroneously included as wastes generated in state when quantities shipped by in-state transfer facilities are included in the total of wastes generated in state.

- Final management of wastes exported to transfer facilities is difficult to determine, as these wastes may be aggregated at the transfer facility with in-state generated waste and sent to one or more waste management facilities.

- Waste shipped by transfer facilities includes wastes from LQGs and SQGs.

To address these problems, states should use the following guidelines:

- For in-state generated waste, reallocate waste quantities shipped from generators to transfer facilities to appropriate in-state CAP Management Categories using Biennial Report forms, follow-up telephone calls, and best professional judgement. States should document and provide rationale for any assumptions made. If a state has knowledge of waste exported by a transfer facility, these waste quantities should be reported as exports, rather than reallocated to in-state CAP Management Categories.

- Disregard waste quantities shipped by transfer facilities. These quantities of waste are accounted for by the reallocation of wastes shipped from generators to transfer facilities.

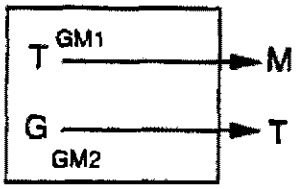
- Reallocate waste quantities imported from other states to transfer facilities to appropriate in-state CAP Management Categories; the waste quantities should be reported as imports to a CAP Management Category.

- Report exports to transfer facilities located in other states in the baseyear tables. However, states will reallocate these quantities to the appropriate CAP Management Categories for projecting future demand on capacity.

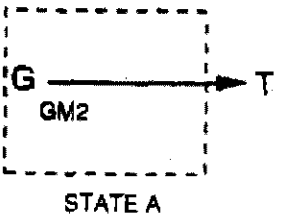
Using these guidelines, waste quantities that are imported by in-state transfer facilities and subsequently exported for management in another state will be excluded from a state's baseline demand. Exhibit 2-2 explains how the transfer facility guidelines affect the information presented in Tables 2 and 3 for (1) exports, (2) waste generated and managed in state, and (3) imports, based on 1991 Biennial Report forms.

Exhibit 2-2
Transfer Facility Information in Tables 2 and 3
Based on 1991 Biennial Report Forms

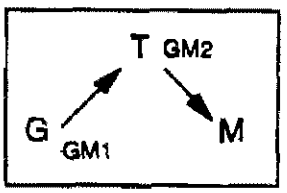
Exports (uses data from GM forms):



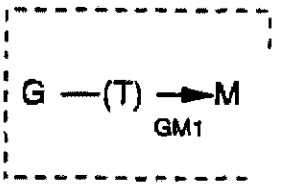
- Disregard shipments by transfer facilities (GM1)
- Report exports to transfer facilities (GM2)
- Report in-state shipments to transfer facilities as exports, instead of reallocating to in-state management, if known that waste was ultimately exported [a]



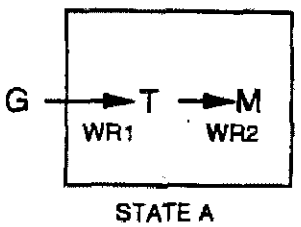
Waste Generated and Managed In State (uses data from GM forms):



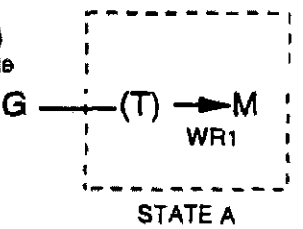
- Disregard shipments by transfer facilities (GM2)
- Reallocate shipments to transfer facilities (GM1) to in-state management, unless knowledge of exports



Imports (uses data from WR forms):



- Reallocate imports to transfer facilities (WR1) to in-state management. Note in CAP if waste was ultimately exported, but do not present export quantity in export column [b]



Type of Facility:
G = Generator
T = Transfer Facility
M = Waste Management Facility

1991 Biennial Report Form:
GM = GM Form
WR = WR Form

= BR Data

= BR Data Reflected in CAP

---

a This step is conducted for the "Waste Generated and Managed In State" column. The generator submits a GM form for an in-state shipment to the in-state transfer facility, and if the state has knowledge that the waste is ultimately exported, then this quantity is reported as exported.

b States use the exports and wastes generated and managed in state information for projections. Consequently, states should not reflect imports to transfer facilities that are then exported in the exports column as then they will be responsible for assuring capacity for these imports.

Interstate Hazardous Waste Imports and Exports

Baseyear tables should include information on hazardous waste imported and exported domestically for management in captive and commercial Subtitle C hazardous waste management systems. For a variety of reasons, differences may exist between waste quantities reported by importing and exporting states. Reconciliation of the differences is important to ensure accurate data for EPA's national assessment of whether capacity shortfalls exist. Thus, states are required to reconcile imports and exports as part of the data quality check for the BRS. If states do identify large discrepancies, they should work with their respective EPA Region to correct the discrepancies in the BRS National Oversight database.

International Hazardous Waste Imports and Exports

Hazardous waste management facilities are required to report waste received from foreign countries on WR forms of the 1991 Biennial Report. The instructions for identifying foreign imports in the baseyear tables assume that states can distinguish imports from wastes generated in state using EPA ID numbers found in Box D on Form WR. Some foreign generators, however, may have headquarters or mailing addresses within the United States; consequently, these generators may have in-state EPA ID numbers. If states are aware of such cases, states should treat waste from these generators as imports rather than as waste generated in state.

Access to foreign treatment, disposal, and recycling capacity is unknown due to the uncertainty about continued availability; consequently, states cannot rely on this capacity for purposes of their CAP and should include estimates for international exports in their CAP tables. States should consider international exports in the same way as interstate exports for the baseyear and for estimating demand on commercial capacity in the projection years. States should determine how internationally exported wastes were ultimately managed in the baseyear, according to CAP Management Categories, and report the quantities in the column labelled 'Exports' in Table 3. States should assume that waste exported internationally is managed in commercial systems unless the state has additional information about the management facility. States may not have complete information on international exports because generators are not required to report on Biennial Report forms waste that was exported out of the country (40 CFR 262.41(b)). Generators who export their wastes to foreign countries, however, are required to submit annual reports according to 40 CFR 262.53. These annual reports of hazardous waste exports are maintained by the Office of Waste Programs Enforcement (OWPE), and are hereafter referred to as the 1991 OWPE Annual Export Reports. States should obtain these reports from their Regional CAP Coordinator and use these reports to identify international exports.[2] (A sample OWPE Annual Export Report for one state is provided in Appendix D.) Detailed instructions for using the 1991 OWPE Annual Export Reports to determine international exports are provided in the instructions for producing Table 3.

[2] EPA Headquarters has supplied the Regional CAP Coordinators with the 1991 OWPE Annual Export Reports.

Mixed Hazardous/Radioactive Wastes

Adequate capacity does not currently exist for the treatment and disposal of mixed hazardous/radioactive wastes due to the technical difficulties involved in treating it and the concerns about human exposure to radiation. Therefore, states are not required to report the demand on capacity for these wastes in the baseyear or projection years. States can identify mixed hazardous/radioactive wastes on the 1991 Biennial Report on Form GM, Section I, Box I (i.e., the data element for RCRA-radioactive mixed waste). States should identify mixed hazardous/radioactive wastes in their 1991 Biennial Report databases and exclude these wastes from the quantities reported in the baseyear and projections tables.

Demand on Capacity from Recurrent and One-time Waste in 1991

States are required to distinguish between recurrent and one-time wastes for wastes generated within their borders that placed demand on commercial management capacity in the baseyear. This distinction is necessary because states should project demand on commercial capacity from only recurrent waste; EPA will estimate the future demand on commercial capacity from one-time waste. States are not required to distinguish between recurrent and one-time wastes for presenting the baseyear demand for on-site and captive management capacity because demand for on-site and captive capacity will not be projected.

Baseyear Tables

The remainder of section 2.3 presents and describes the four baseyear tables. For each table, the following information is provided:

- Purpose of the table;
- Data elements from the 1991 Biennial Report necessary for producing the table;
- Guidance for using the 1991 Biennial Report data elements to produce the table;
- Copy of the table; and
- Flowchart(s) summarizing the instructions for producing the table.

The tables present the CAP Management Categories and the type of quantitative information that states should provide. If states do not need to provide quantitative information for a particular CAP Management Category, the relevant space in the table is shaded. For example, in Table 1 (1991 Hazardous Waste Generated and Managed On Site) the space for Transfer/Storage is shaded because this CAP Management Category is not relevant for wastes managed on site.

Throughout the discussion of the tables, data elements (e.g., unit of measure (UOM) and density) and other terms (e.g., large quantity generators (LQGs)) used in the 1991

Biennial Report are referenced. These data elements and terms are presented on the Biennial Report Identification and Certification (IC), Waste Generation and Management (GM), Waste Received From Off Site (WR), and Waste Treatment, Disposal, and Recycling Process Systems (PS) forms. States should refer to the 1991 Biennial Report Instructions and Forms for a more detailed discussion of data elements and terms.[3]

Table 1. 1991 Hazardous Waste Generated and Managed On Site

Purpose. Table 1 presents demand for on-site management of hazardous waste by CAP Management Category.[4] Using this table, a state will show how much of its waste is managed in systems on site.[5] Table 1 represents management of hazardous wastes in systems not available for captive or commercial use. Consequently, wastes that are generated and managed on site in commercial systems, including residuals, should be included in Tables 2 or 3 rather than Table 1 (i.e., off-site wastes stabilized and landfilled on site at a commercial unit).

States are not required to demonstrate adequate capacity for hazardous wastes that are managed in on-site systems. Rather, states can assume that the capacity needed to manage hazardous wastes on site will continue to be available in future years. If a state has knowledge of a specific event that will cause a significant shift from on-site to commercial management, however, this shift should be considered in projections. For example, a generator has notified the state of its intent to close its on-site landfill. If the generator continues to generate waste, demand will shift from on-site to commercial management capacity and this shift should be considered in the projections.

Data Elements. Table 1 is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form GM
- RCRA-radioactive Mixed (GM.I.I)
- UOM and Density (GM.II.C)
- Quantity Treated, Disposed or Recycled On Site in 1991 (GM.II - On-site System)
- System Type (GM.II - On-site System)

---

[3] U.S. Environmental Protection Agency, 1991 Hazardous Waste Report Instructions and Forms, EPA Form 8700-13A/B (5-80) (Revised 08-91), OMB #2050-0024.

[4] In Table 1, states are not required to distinguish between recurrent and one-time waste in the demand for on-site capacity.

[5] This table does not necessarily present a comprehensive baseyear picture of on-site management because some facilities may not report in the Biennial Report waste managed on site in exempt processes. In their Phase 1 submissions, states should discuss known caveats associated with this table.

Table 1:
1991 Hazardous Waste Generated and Managed On Site (tons)

CAP Management Category	Waste Managed On Site
RECOVERY[a]	
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
TREATMENT[a]	
Stabilization/Chemical Fixation	
Incineration - Liquids and Gases	
Incineration - Sludges/Solids	
Fuel Blending	
Hazardous Wastewaters and Sludges Treatment	
DISPOSAL	
Landfill	
Deepwell/Underground Injection	
Land Treatment/Farming	
TRANSFER/STORAGE	
Transfer/Storage	

[a] Data may not be complete for these technologies because facilities are not required to report in the 1991 Biennial Report waste managed in exempt processes.

Instructions. Exhibit 2-3 presents a flowchart for Table 1. Five steps are necessary to produce this table.

Step 1 **Exclude mixed hazardous/radioactive wastes**. Use the RCRA-radioactive Mixed code, data element GM.I.I, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 1.

Step 2 **Convert waste quantities to short tons**. Use the UOM and Density in data element GM.II.C and the conversion factors listed in Appendix E to convert to short tons the quantities reported in data element GM.II.

Step 3 **Assign waste quantities to appropriate CAP Management Categories**. Use the On-site System Type data element in GM.II and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 4 **Exclude quantities of wastes managed at commercial systems**. Use generators' PS forms and other state information to determine the commercial status of the system and exclude from Table 1 quantities of wastes managed at commercial systems. These quantities should be presented in the "Wastes Generated and Managed In-state" column of Table 3.

Step 5 **Determine quantities managed on site for each CAP Management Category**. Sum the waste quantities by CAP Management Category.

Exhibit 2-3
Flowchart for Table 1:
1991 Hazardous Waste Generated and Managed On Site

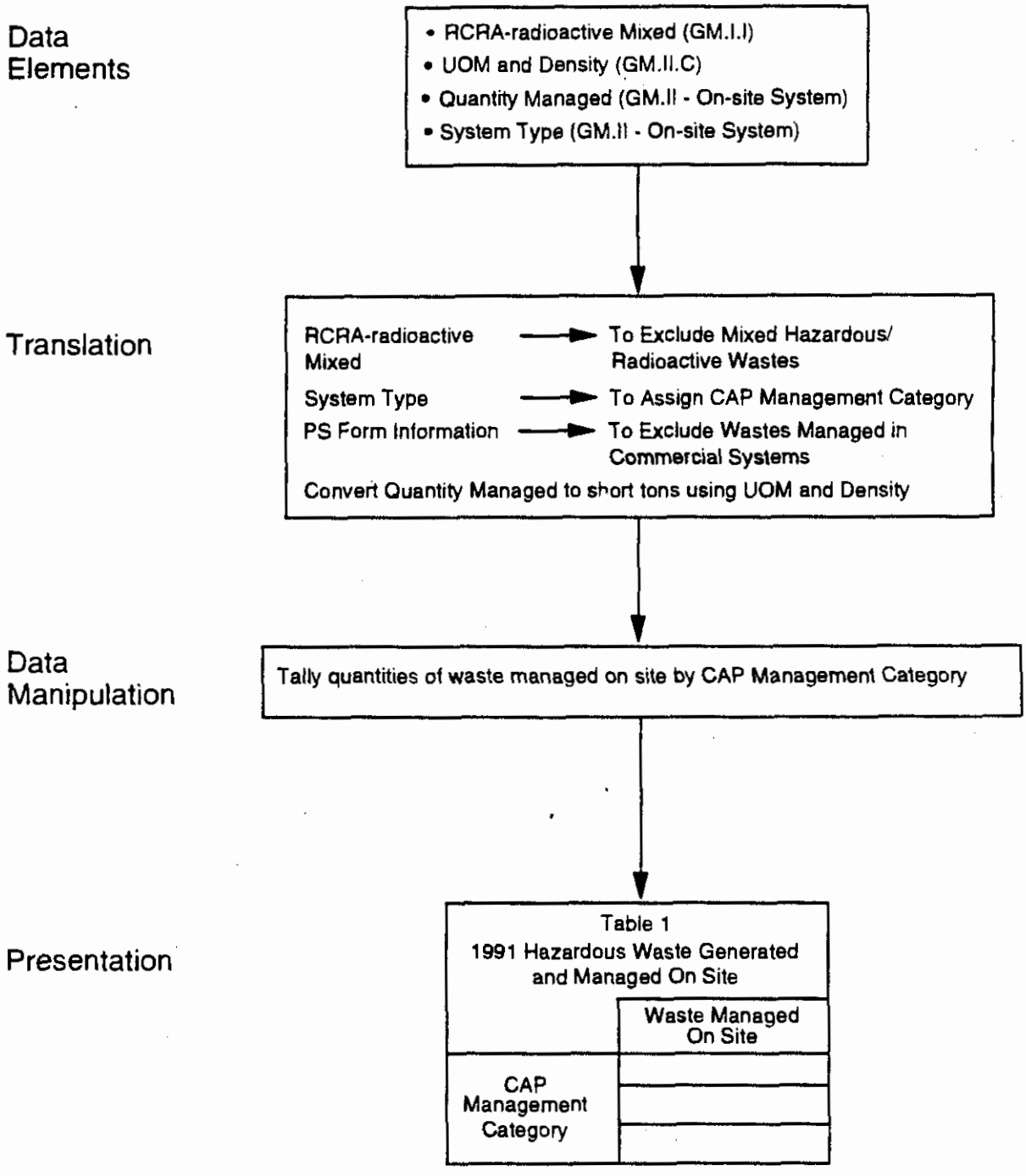


Table 2. 1991 Management of Hazardous Waste in Captive Systems

Purpose. States should use Table 2 to present the demand placed on captive management systems in 1991, divided into the following three columns: (1) waste exported to captive systems; (2) waste both generated and managed within the state in captive systems; and (3) waste imported for management in captive systems. This table summarizes management by the commercial status of the system, rather than the commercial status of the facility. This distinction is made because captive facilities can have on-site systems in addition to the captive system(s). States should report management in captive systems because significant captive capacity may exist and captive facilities may manage large quantities of in-state and imported waste. Table 2 does not include the demand placed on limited commercial capacity; this demand is included in Table 3.

In Table 2, states are not required to distinguish between demand on captive capacity from recurrent and one-time wastes, because states will not be required to project wastes managed in captive systems. As with on-site management, however, if a state is aware of a specific event that would cause a significant shift from captive to commercial management, this shift should be considered in the projections.

The 'Exports' column of Table 2 reports the quantity of hazardous waste that a state exported to captive systems by CAP Management Category. States should quantify and present baseyear exports to captive systems in order to:

- Determine the quantity of waste generated in state that is exported;
- Identify the quantity of waste that is exported due to the transfer of wastes to a company's out-of-state captive facilities;
- Assist in capacity assurance planning dialogues with other states; and
- Demonstrate their understanding of their demand on captive capacity in other states.

The 'Waste Generated and Managed In State' column identifies the quantity of hazardous waste that remained in state for management in captive systems.

The 'Imports' column of Table 2 presents the quantity of hazardous waste that was imported to a state's captive systems by CAP Management Category. States should quantify and present baseyear imports to captive systems in order to:

- Identify types of captive management capacity available in state to out-of-state generators;
- Assist in capacity assurance planning dialogues with other states;
- Summarize how imported wastes were managed in 1991; and
- Identify the quantity of waste being imported as a result of the location of a company's captive facilities.

Table 2:
1991 Management of Hazardous Waste in Captive Systems (tons)

CAP Management Category	Exports	Waste Generated and Managed In State	Imports
RECOVERY			
Metals Recovery			
Inorganics Recovery			
Organics Recovery			
Energy Recovery - Liquids			
Energy Recovery - Sludges/Solids			
TREATMENT			
Stabilization/Chemical Fixation			
Incineration - Liquids and Gases			
Incineration - Sludges/Solids			
Fuel Blending			
Hazardous Wastewaters and Sludges Treatment			
DISPOSAL			
Landfill			
Deepwell/Underground Injection			
Land Treatment/Farming			
TRANSFER/STORAGE			
Transfer/Storage			

The following sections contain the data elements and instructions for states to use in determining the quantities to report in each of the columns in Table 2.

Data Elements For 'Exports' Column of Table 2. The 'Exports' column is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form GM
- RCRA-radioactive Mixed (GM.I.I)
- EPA ID of Receiver (GM.III.B)
- Origin (GM.I.E)
- Off-site Availability (GM.III.D)
- UOM and Density (GM.II.C)
- Quantity Shipped (GM.III.E)
- System Type Shipped To (GM.III.C)

Instructions For 'Exports' Column. Exhibit 2-4 presents a flowchart of the seven steps for deriving exports for this column.

Step 1 **Exclude mixed hazardous/radioactive wastes.** Use the RCRA-radioactive Mixed code, data element GM.I.I, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 2.

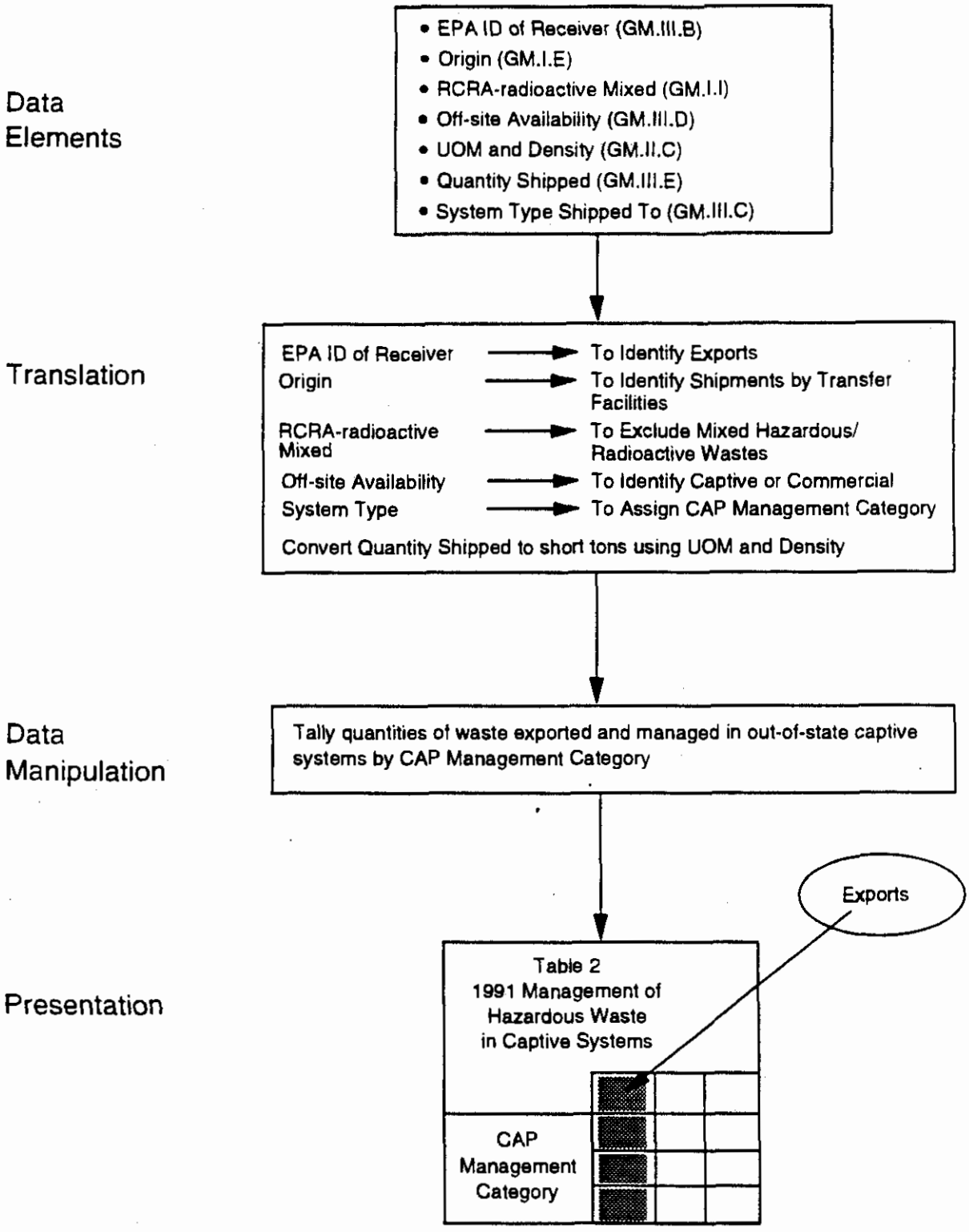
Step 2 **Identify interstate exports.** Use the first two letters of the EPA ID of Receiver (i.e., the twelve-digit EPA identification number of the off-site source to which the waste was sent) from data element GM.III.B to identify the waste quantities that represent interstate exports.

Step 3 **Disregard waste quantities exported by transfer facilities.** Use the Origin code data element GM.I.E to identify waste shipped by transfer facilities. Disregard waste quantities with an Origin code = 4 (the hazardous waste stream was received from off site and was not recycled or treated on site).

Step 4 **Identify commercial status of facility.** Use the Off-site Availability code in data element GM.III.D; Code 2 indicates management at captive facilities.[6] Code 8 represents "Don't Know"; wastes with this code should not be included in Table 2. (These wastes should be included under commercial capacity in Table 3.)

[6] The Off-site Availability code is facility-specific rather than system-specific; however, the commercial availability of the facility as indicated by this code is most likely representative of the availability of the primary treatment system.

Exhibit 2-4
Flowchart for 'Exports' Column of Table 2:
1991 Management of Hazardous Waste in Captive Systems



Step 5 **Convert waste quantities to short tons**. Use the UOM and Density in data element GM.II.C and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Shipped data element GM.III.E.

Step 6 **Assign waste quantities to appropriate CAP Management Categories**. Use the System Type Shipped To data element GM.III.C and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 7 **Determine quantities managed at captive facilities for each CAP Management Category**. Sum the waste quantities managed at captive facilities by CAP Management Category and place in the 'Exports' column of Table 2.

Data Elements for 'Waste Generated and Managed In State' Column of Table 2. This column is based on the following data elements from the 1991 Biennial Report or equivalent data:

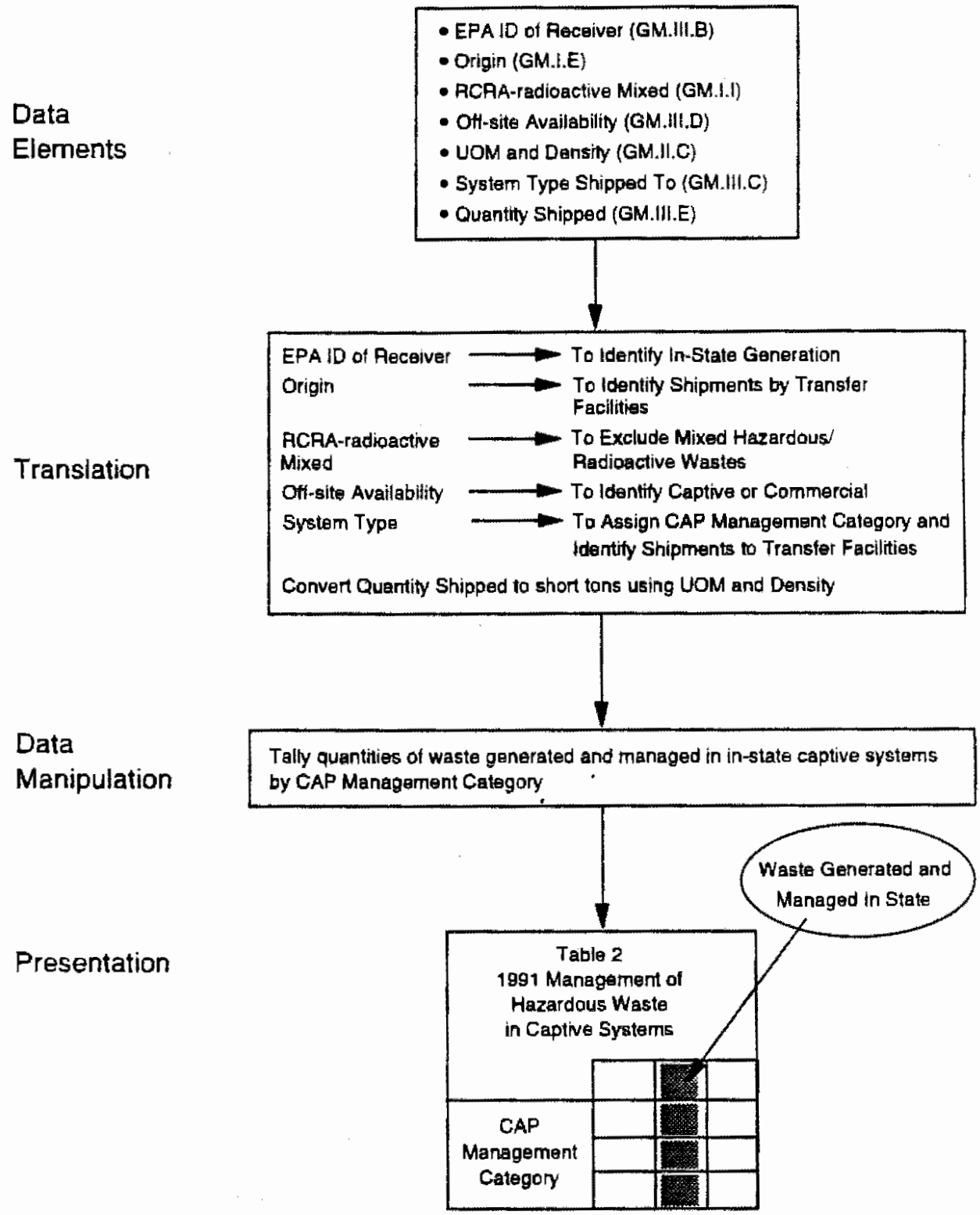
Form GM
- RCRA-radioactive Mixed (G.M.I.I)
- EPA ID of Receiver (GM.III.B)
- Origin (GM.I.E)
- Off-site Availability (GM.III.D)
- UOM and Density (GM.II.C)
- Quantity Shipped (GM.III.E)
- System Type Shipped To (GM.III.C)

Instructions For 'Waste Generated and Managed In State' Column. Exhibit 2-5 presents a flowchart for deriving estimates for waste generated and managed in state. Eight steps are required to derive the estimates for this column.

Step 1 **Exclude mixed hazardous/radioactive wastes**. Use the RCRA-radioactive Mixed code, data element GM.I.I, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 2.

Step 2 **Identify in-state shipments**. Use the first two letters of the EPA ID of Receiver (i.e., the twelve-digit EPA identification number of the off-site source to which the waste was sent) from data element GM.III.B to identify in-state shipments.

Exhibit 2-5
Flowchart for 'Waste Generated and Managed In State' Column of Table 2: 1991 Management of Hazardous Waste in Captive Systems



Step 3 **Disregard waste quantities shipped by transfer facilities**. Use the Origin code data element GM.I.E to identify waste shipped by transfer facilities. Disregard waste quantities with an Origin code = 4 (the hazardous waste stream was received from off site and was not recycled or treated on site).

Step 4 **Identify commercial status of system**. Use the Off-site Availability code from data element GM.III.D; Code 2 indicates management at captive facilities. Code 8 represents "Don't Know"; wastes with this code should not be included in Table 2. (These wastes should be included under commercial capacity in Table 3.)

Step 5 **Convert waste quantities to short tons**. Use the UOM and Density in data element GM.II.C and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Shipped data element GM.III.E.

Step 6 **Assign waste quantities to appropriate CAP Management Categories**. Use the System Type Shipped To data element GM.III.C and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 7 **Reallocate waste quantities shipped from generators to transfer facilities**. Use the GM form and best professional judgment to reallocate waste quantities shipped to transfer facilities to the appropriate CAP Management Categories. States should document and provide rationale for any assumptions made. GM forms with a System Type Shipped To = M141 (transfer facility storage, waste was shipped off site with no on-site TDR activity) indicate waste quantities shipped from generators to transfer facilities. If a state has knowledge that a transfer facility exports waste, these waste quantities should be allocated to the 'Exports' column of Table 2, rather than the 'Waste Generated and Managed In State' column.[7]

Step 8 **Determine quantities managed in captive systems for each CAP Management Category**. Sum the waste quantities managed in captive systems by CAP Management Category and place in the 'Wastes Generated and Managed In State' column of Table 2.

[7] Reallocating known exports is necessary to avoid allocating waste quantities to in-state CAP Management Categories that do not exist within the state.

Data Elements for 'Imports' Column of Table 2. This column is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form WR
- RCRA-radioactive Mixed (WR.H)
- Off-site Source EPA ID (WR.D)
- UOM and Density (WR.F)
- Quantity Received (WR.E)
- System Type (WR.I)

Form PS
- System Type (PS.I.B)
- Commercial Capacity Availability (PS.II.F)

Instructions For 'Imports' Column. Exhibit 2-6 presents a flowchart for deriving estimates for imports. Seven steps are required to derive the estimates for this column.

Step 1 **Exclude mixed hazardous/radioactive wastes.** Use the RCRA-radioactive Mixed code, data element WR.H, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 2.

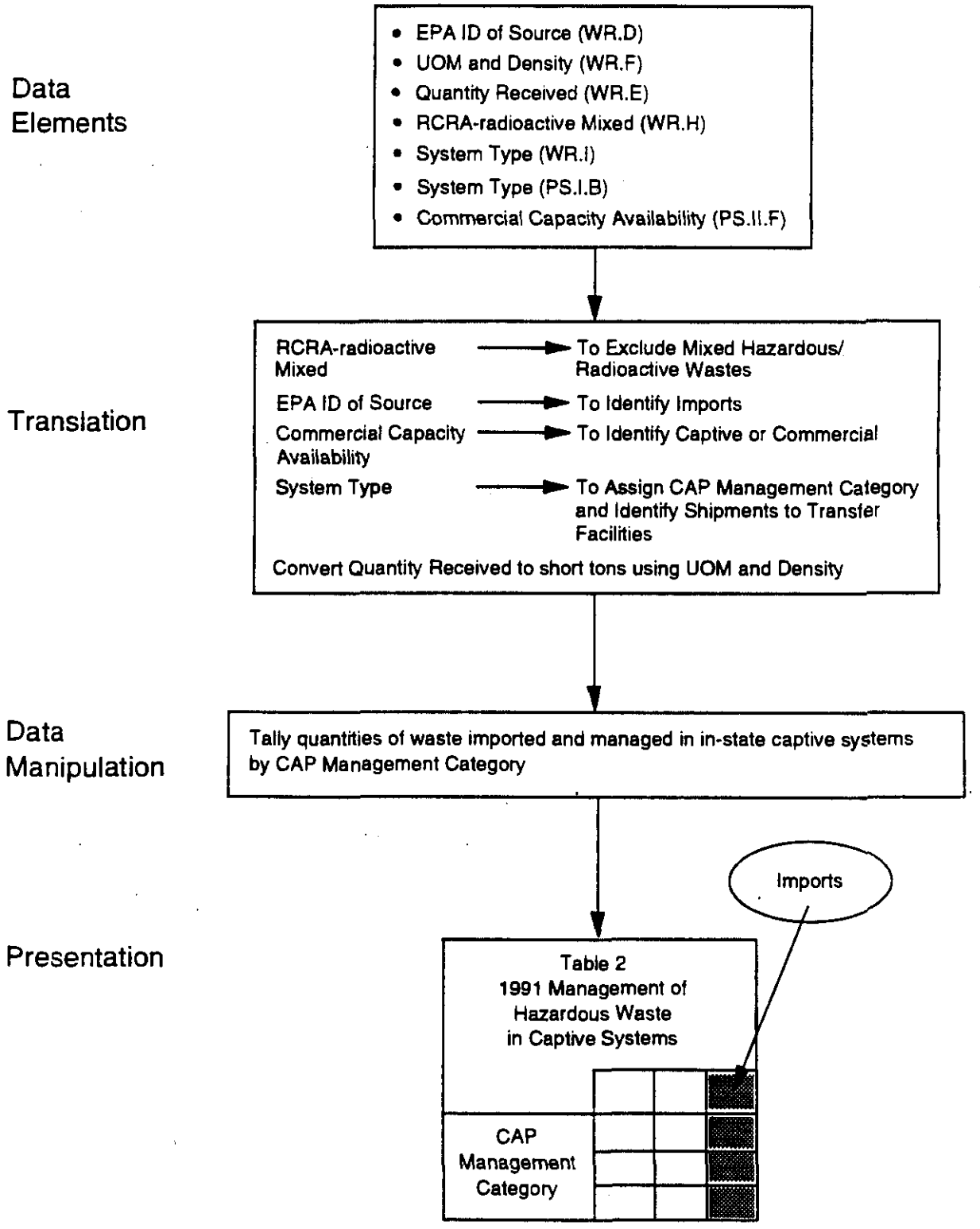
Step 2 **Identify interstate imports.** Use the first two letters of the EPA ID of Source (i.e., the twelve-digit EPA identification number of the off-site source from which the waste was received) from data element WR.D to identify imports.

Step 3 **Identify commercial status of system.** Use the System Type (PS.I.B) and Commercial Capacity Availability code (PS.II.F) to identify the commercial status of the system; Code 2 indicates management in captive systems. If this data element is missing, use the best available information on commercial availability.

Step 4 **Convert waste quantities to short tons.** Use the UOM and Density in data element WR.F and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Received data element WR.E.

Step 5 **Assign waste quantities to appropriate CAP Management Categories.** Use the System Type data element WR.I and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Exhibit 2-6
Flowchart for 'Imports' Column of Table 2:
1991 Management of Hazardous Waste in Captive Systems



Step 6 **Reallocate waste quantities imported to transfer facilities.** Use the WR form and best professional judgement to reallocate waste quantities imported to transfer facilities to the appropriate CAP Management Categories. States should document and provide rationale for any assumptions made. WR forms with a System Type code = M141 (transfer facility storage, waste was shipped off site with no on-site TDR activity) indicate imports to transfer facilities.[8]

Step 7 **Determine quantities managed in captive systems for each CAP Management Category.** Sum the waste quantities managed in captive systems by CAP Management Category and place in the 'Imports' column of Table 2.

[8] If states have knowledge that waste imported to transfer facilities was ultimately exported for management, they should note this caveat in their CAP documentation.

Table 3. 1991 Management of Hazardous Waste in Commercial Systems

Purpose. States should use Table 3 to present the demand placed on commercial management systems in 1991, divided into five columns: (1) recurrent waste exported to commercial systems; (2) one-time waste exported to commercial systems; (3) recurrent waste generated and managed within the state in commercial systems; (4) one-time waste generated and managed within the state in commercial systems; and (5) waste imported for management in commercial systems. This table summarizes management by the commercial status of the system, rather than the commercial status of the facility. This distinction is made because commercial facilities can have captive and on-site management systems in addition to the commercially available system(s).

States need to distinguish between recurrent versus one-time waste for waste generated within their borders that placed demand on commercial capacity in 1991 because they are required to project demand on commercial capacity from only recurrent waste. EPA will estimate the future demand on commercial capacity from one-time waste. States should provide this information in Table 3 in the columns labelled 'Exports/Recurrent and One-time' and 'Waste Generated and Managed In State/Recurrent and One-time.'

States are not required to distinguish between recurrent and one-time waste for imports because states do not need to assure capacity for imported waste. (The distinction is only relevant for the state that exported the waste.) In addition, imports cannot be separated into recurrent and one-time waste using 1991 Biennial Report information.

The 'Exports' column of Table 3 reports the quantity of nazardous waste that a state exported to commercial systems by CAP Management Category. States need to quantify and present baseyear exports to commercial systems in order to:

- Determine the quantity of waste generated in state that is exported;
- Assist in capacity assurance planning dialogues with other states;
- Demonstrate their understanding of the demand for commercial capacity in other states; and
- Demonstrate the states' understanding of demand on commercial management capacity from recurrent versus one-time waste.

The 'Waste Generated and Managed In State' column identifies the quantity of recurrent and one-time waste that remained in state for management in commercial systems.

Table 3:
1991 Management of Hazardous Waste in Commercial Systems (tons)

CAP Management Category	Exports		Waste Generated and Managed In State		Imports[a]
	Recurrent	One-time	Recurrent	One-time	
RECOVERY					
Metals Recovery					
Inorganics Recovery					
Organics Recovery					
Energy Recovery - Liquids					
Energy Recovery - Sludges/Solids					
TREATMENT					
Stabilization/Chemical Fixation					
Incineration - Liquids and Gases					
Incineration - Sludges/Solids					
Fuel Blending					
Hazardous Wastewaters and Sludges Treatment					
DISPOSAL					
Landfill					
Deepwell/Underground Injection					
Land Treatment/ Farming					
TRANSFER/STORAGE					
Transfer/Storage					

[a] Imports cannot be divided into recurrent and one-time wastes due to limitations of information provided on Biennial Report WR forms.

The 'Imports' column of Table 3 reports the quantity of hazardous waste that was imported to a state's commercial systems by CAP Management Category. States need to quantify and present baseyear imports to commercial systems in order to:

- Identify types of commercial management capacity available in state to out-of-state generators;
- Assist in capacity assurance planning dialogues with other states; and
- Summarize how imported wastes were managed in 1991.[9]

The following sections contain the data elements and instructions for states to use in determining the quantities to report in each of the columns in Table 3.

Data Elements For 'Exports' Column of Table 3. The 'Exports' column is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form GM
- RCRA-radioactive Mixed (GM.I.I)
- EPA ID of Receiver (GM.III.B)
- Origin (GM.I.E)
- Off-site Availability (GM.III.D)
- UOM and Density (GM.II.C)
- Quantity Shipped (GM.III.E)
- System Type Shipped To (GM.III.C)

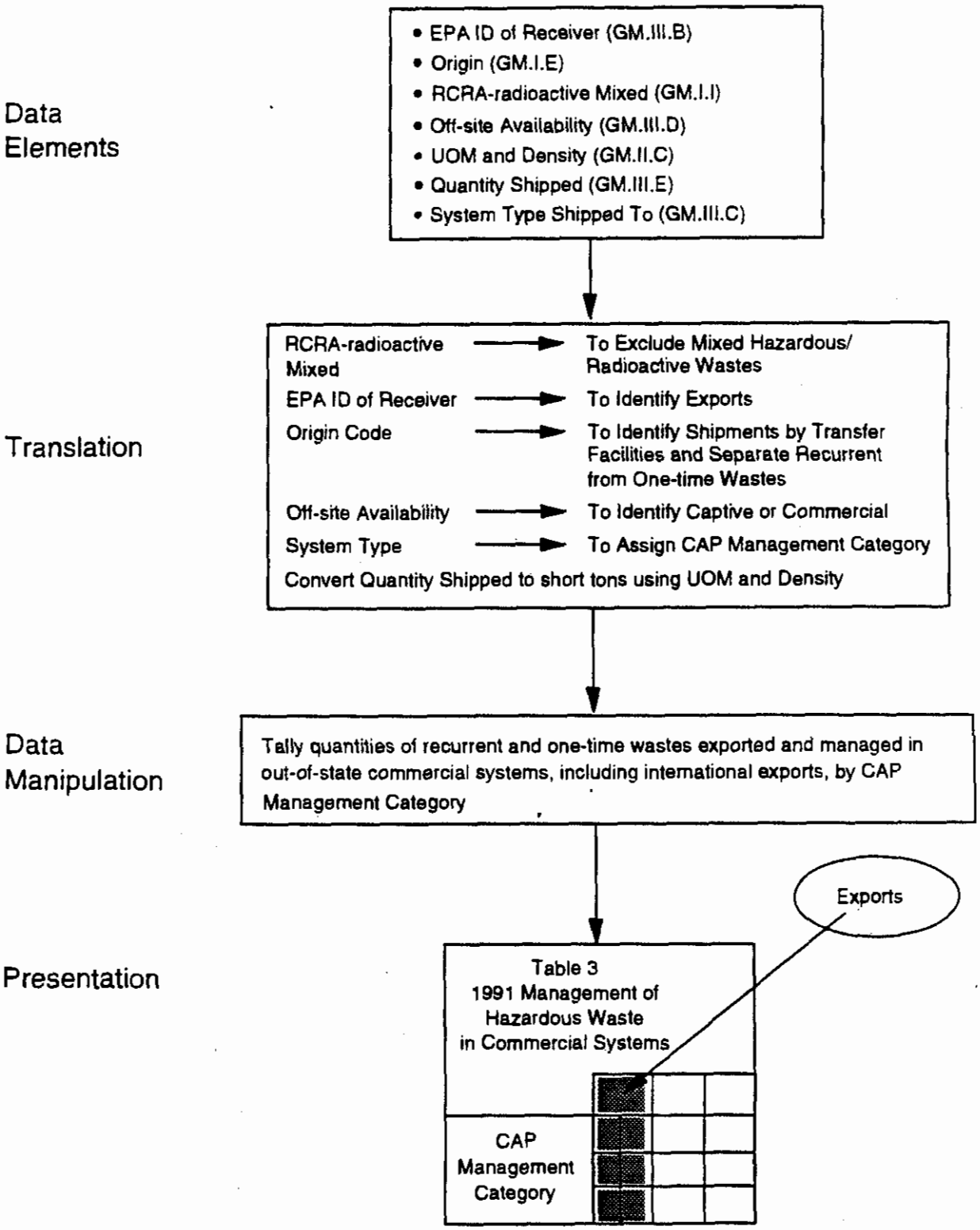
Instructions For 'Exports' Column. Exhibit 2-7 presents a flowchart for deriving exports. Nine steps are required to produce this column.

Step 1 **Exclude mixed hazardous/radioactive wastes.** Use the RCRA-radioactive Mixed code, data element GM.I.I, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 3.

Step 2 **Identify interstate exports.** Use the first two letters of the EPA ID of Receiver (i.e., the twelve-digit EPA identification number of the off-site source to which the waste was sent) from data element GM.III.B to identify the waste quantities that represent interstate exports.

[9] The method for determining demand placed on commercial management capacity from imported waste does not allow for the distinction between recurrent and one-time waste.

Exhibit 2-7
Flowchart for 'Exports' Column of Table 3:
1991 Management of Hazardous Waste in Commercial Systems



Step 3 **Disregard waste quantities exported by transfer facilities.** Use the Origin code data element GM.I.E to identify waste shipped by transfer facilities. Disregard waste quantities with an Origin code = 4 (the hazardous waste stream was received from off site and was not recycled or treated on site).

Step 4 **Identify commercial status of facility.** Use the Off-site Availability code in data element GM.III.D; Code 1 indicates management at commercial facilities.[10] Code 8 represents "Don't Know"; include waste quantities with Code 8 in this table.

Step 5 **Convert waste quantities to short tons.** Use the UOM and Density in data element GM.II.C and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Shipped data element GM.III.E.

Step 6 **Assign waste quantities to appropriate CAP Management Categories.** Use the System Type Shipped To data element GM.III.C and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 7 **Separate recurrent waste from one-time waste.** Use the Origin code data element GM.I.E to identify whether waste is recurrent or one-time; Code 2 represents one-time wastes and Codes 1, 3, and 5 represent recurrent wastes. If the code is missing, assume the waste is recurrent and document in the CAP the quantity assumed to be recurrent due to missing Origin codes.

Step 8 **Identify international exports.** Use the guidelines provided in the following section to determine the quantity of international exports and add to the quantity of interstate exports.

Step 9 **Determine quantities managed at commercial facilities for each CAP Management Category.** Sum recurrent and one-time wastes by CAP Management Category separately, and place quantities for commercial facilities in Table 3.

Data elements for determining international exports for 'Exports' Column in Table 3. The two primary data sources for determining international exports are the 1991 OWPE Annual Export Reports and the 1991 Biennial Report. A sample OWPE Annual Report for 1990 for one state is presented in Appendix D. States should use the following data elements to determine international exports:

[10] The Off-site Availability code is facility-specific rather than system-specific; however, the commercial availability of the facility as indicated by this code is most likely representative of the availability of the primary treatment system.

1991 OWPE Annual Export Forms
EPA ID and Name of Generator
EPA ID and Name of Receiver
Description of Waste
Unit of Measure (UOM)
Quantity Exported

1991 Biennial Report Forms
EPA ID of TSDR Facility (PS)
System Type (PS.I.B)

Instructions for including international exports in the 'Exports' Column of Table 3. Eight steps are necessary to derive estimates for international exports.[11]

Step 1 **Identify international exports.** Obtain copies of the 1991 OWPE Annual Export Reports from the EPA Regional CAP Coordinator. These reports should be used to identify quantities of international exports.

Step 2 **Exclude mixed hazardous/radioactive wastes.** If the waste description in the OWPE Annual Export Reports indicates that the waste is a mixed hazardous/radioactive waste, exclude quantities associated with this waste from international export estimates.

Step 3 **Disregard waste quantities exported by transfer facilities.** Disregard waste quantities shipped by transfer facilities to foreign hazardous waste management facilities. Wastes shipped from generators to transfer facilities are accounted for in the 'Waste Generated and Managed in State' column. To consider transfer facilities in international exports would result in double counting of these waste quantities. Use the System Type code in the PS form (PS.I.B) to identify transfer facilities. System Type code M141 represents transfer facilities. In the absence of the PS form, states should use best professional judgement or contact the facility to determine whether a facility is a transfer facility. States should document and provide rationale for any assumptions made.

Step 4 **Identify commercial status of the system.** The OWPE Annual Export Reports do not indicate the commercial status of a system. Consequently, states should use their knowledge of the

[11] 1991 OWPE Annual Export Reports track only RCRA hazardous wastes. Consequently, state-designated hazardous wastes that are exported internationally are not included in the estimates for international exports.

receiving facility to determine whether the management system is commercial or captive. If the state has insufficient data, it can identify the EPA identification numbers and names of the generators exporting to a particular facility. Based upon the names of both the generators and receivers, states may be able to establish common ownership and thus its commercial status. In the absence of clear information, though, states should designate a receiving facility as commercial.

Step 5 **Distinguish recurrent and one-time wastes**. Use best professional judgement to distinguish recurrent and one-time wastes. An indicator of one-time wastes, for example, may be the sudden appearance of an LQG shipping contaminated soil and debris. Additional information may be found in the identity of the exporter. For example, a real estate development company or architectural firm is not typically involved in recurrent generation. If insufficient data are available to determine whether the waste is from a recurrent or one-time activity, state should assume that the waste is recurrent. States should document and provide rationale for any assumptions made.

Step 6 **Convert waste quantities to short tons**. The UOM may be found in the OWPE Annual Export Reports. For the OWPE Annual Export Report, six types of UOMs are used: T=short tons, P=pounds, Y=cubic yards, K=kilograms, L=liters, and G=gallons. Use the conversion factors provided in Appendix E to convert to short tons. Use best professional judgement or contact the facility to determine the density to use when converting liters and gallons to short tons.

Step 7 **Assign waste quantities to CAP Management Categories**. The system types used to manage the wastes are not indicated on the OWPE Annual Export Reports. Appendix D presents the foreign facilities receiving hazardous wastes for management and the corresponding services offered. This list is not intended to be comprehensive but rather is offered as a guide. Also consider the waste descriptions and EPA waste codes in examining potential management options. Use best professional judgement in determining whether the management options presented in Appendix D are appropriate for the waste. States may assign the wastes to an alternate CAP Management Category if they believe that those listed in Appendix D are inappropriate. If a CAP Management Category other than that provided in Appendix D is used, states should provide the rationale for this designation.

Step 8 **Determine quantities managed in commercial systems for each CAP Management Category.** Sum the quantities managed in foreign commercial systems by CAP Management Category for both recurrent and one-time wastes. Add these quantities to the quantities of interstate exports.

Data Elements for 'Waste Generated and Managed In State' Column of Table 3. This column is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form GM
- RCRA-radioactive Mixed (GM.I.I)
- EPA ID of Receiver (GM.III.B)
- Origin (GM.I.E)
- Off-site Availability (GM.III.D)
- UOM and Density (GM.II.C)
- Quantity Shipped (GM.III.E)
- System Type Shipped To (GM.III.C)

Instructions For 'Waste Generated and Managed In State' Column. Exhibit 2-8 presents a flowchart for deriving estimates for waste generated and managed in state. Nine steps are required to produce this column.

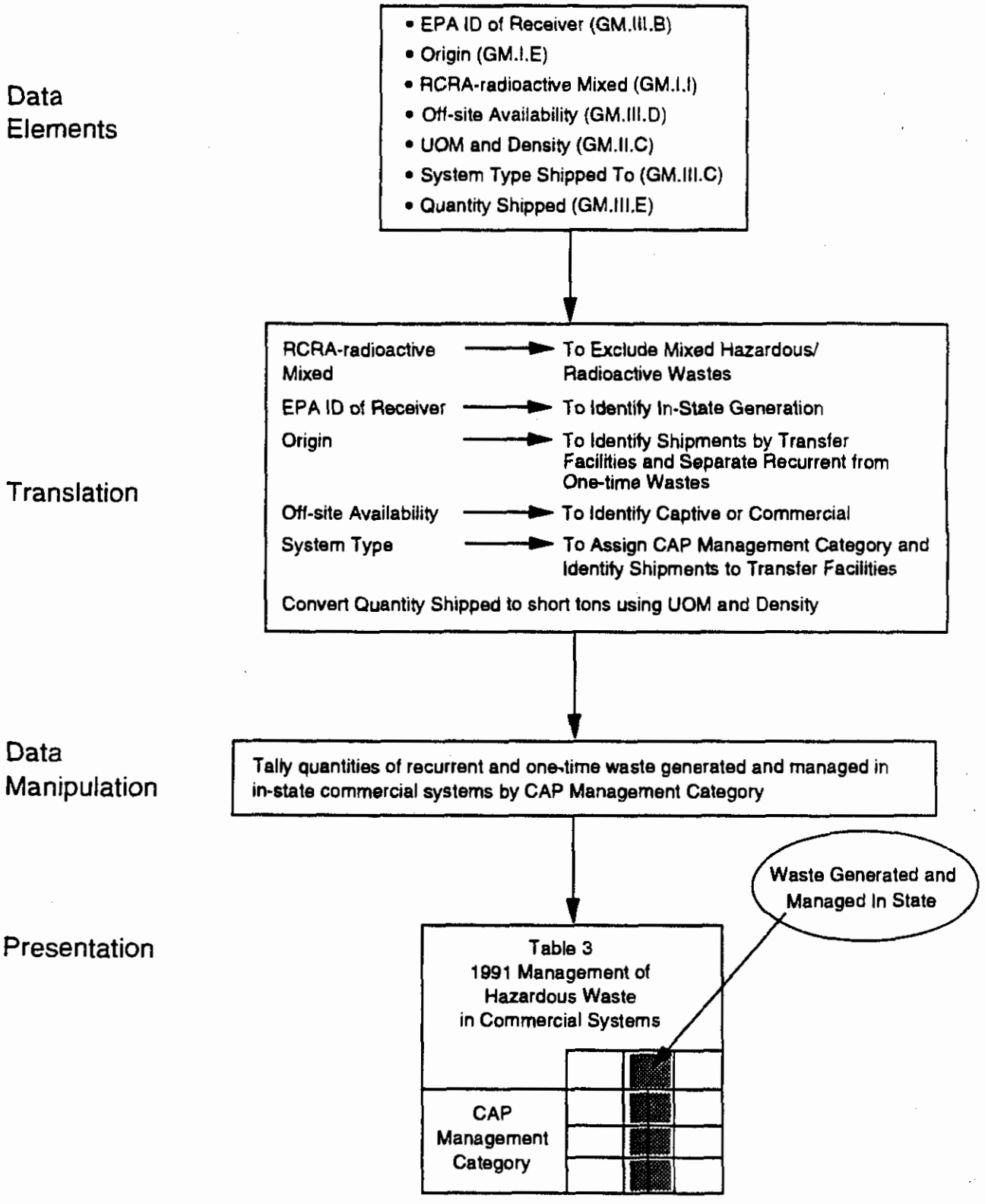
Step 1 **Exclude mixed hazardous/radioactive wastes.** Use the RCRA-radioactive Mixed code, data element GM.I.I, to identify mixed hazardous/radioactive wastes. Code 1 indicates mixed hazardous/radioactive waste; exclude wastes with Code 1 from Table 3.

Step 2 **Identify in-state shipments.** Use the first two letters of the EPA ID of Receiver (i.e., the twelve-digit EPA identification number of the off-site source to which the waste was sent) from data element GM.III.B to identify in-state shipments.

Step 3 **Disregard waste quantities shipped by transfer facilities.** Use the Origin code, data element GM.I.E, to identify waste shipped by transfer facilities. Disregard waste quantities with an Origin Code = 4 (the hazardous waste stream was received from off site and was not recycled or treated on site).

Step 4 **Identify commercial status of system.** Use the Off-site Availability code from data element GM.III.D; Code 1 indicates management at commercial facilities. Code 8 represents "Don't Know"; include waste quantities with Code 8 in this table.

Exhibit 2-8
Flowchart for 'Waste Generated and Managed In State' Column of Table 3: 1991 Management of Hazardous Waste in Commercial Systems



Step 5 **Convert waste quantities to short tons**. Use the UOM and Density in data element GM.II.C and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Shipped data element GM.III.E.

Step 6 **Assign waste quantities to appropriate CAP Management Categories.** Use the System Type Shipped To data element GM.III.C and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 7 **Reallocate waste quantities shipped from generators to transfer facilities**. Use the GM form and best professional judgement to reallocate waste quantities shipped to transfer facilities to the appropriate CAP Management Categories. GM forms with a System Type Shipped To = M141 (transfer facility storage, waste was shipped off site with no on-site TDR activity) indicate waste quantities shipped from generators to transfer facilities. If a state has knowledge that a transfer facility exports waste, these waste quantities should be allocated to the 'Exports' column of Table 3, rather than the 'Waste Generated and Managed In State' column.[12] States should document and provide rationale for any assumptions made.

Step 8 **Separate recurrent waste from one-time waste**. Use the Origin code, data element GM.I.E, to identify whether waste is recurrent or one-time; Code 2 represents one-time wastes and Codes 1, 3, and 5 represent recurrent wastes. If the code is missing, assume the waste is recurrent and document in the CAP the quantity assumed to be recurrent due to missing origin codes.

Step 9 **Determine quantities managed in commercial systems for each CAP Management Category**. Sum recurrent and one-time wastes by CAP Management Category separately, and place quantities for commercial systems in Table 3.

[12] Reallocating known exports is necessary to avoid allocating waste quantities to in-state CAP Management Categories that do not exist within the state.

Data Elements for 'Imports' Column of Table 3. This column is based on the following data elements from the 1991 Biennial Report or equivalent data:

Form WR
- RCRA-radioactive Mixed (WR.H)
- Off-site Source EPA ID (WR.D)
- UOM and Density (WR.F)
- Quantity Received (WR.E)
- System Type (WR.I)

Form PS
- System Type (PS.I.B)
- Commercial Capacity Availability (PS.II.F)

Instructions For 'Imports' Column. Exhibit 2-9 presents a flowchart for deriving estimates for imports. Since the WR form does not provide information to distinguish between recurrent and one-time wastes, states do not need to separate imported wastes into these categories. Seven steps are required to derive the estimates for this column:

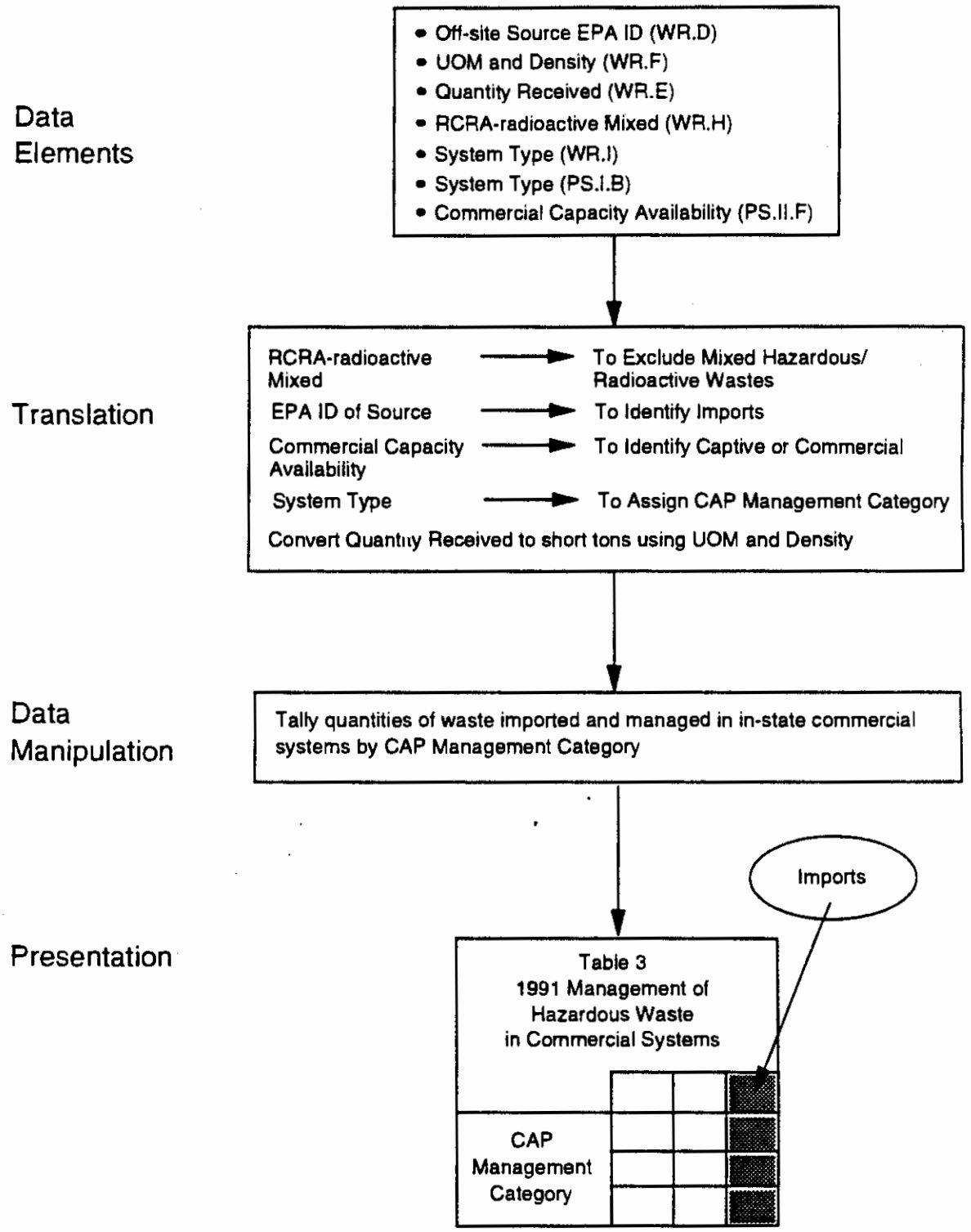
Step 1 **Exclude mixed hazardous/radioactive wastes.** Use the RCRA-radioactive mixed code, data element WR.H, to identify mixed hazardous/radioactive wastes. Code 1 indicates wastes with mixed hazardous radioactive wastes; exclude wastes with Code 1 from Table 3.

Step 2 **Identify imports.** Use the first two letters of the EPA ID of Source (i.e., the twelve-digit EPA identification number of the off-site source from which the waste was received) from data element WR.D to identify imports.

Step 3 **Identify commercial status of system.** Use the System Type (PS.I.B) and the Commercial Capacity Availability code (PS.II.F) to identify the commercial status of the system; Code 4 indicates management in commercial systems. Code 3 represents limited commercial status; waste with Code 3 should be included in this table. If this data element is missing, use the best available information on commercial availability.

Step 4 **Convert waste quantities to short tons.** Use the UOM and Density in data element WR.F and the conversion factors listed in Appendix E to convert to short tons the quantities reported in the Quantity Received data element WR.E.

Exhibit 2-9
Flowchart for 'Imports' Column of Table 3:
1991 Management of Hazardous Waste in Commercial Systems



Step 5 **Assign waste quantities to appropriate CAP Management Categories**. Use the System Type data element WR.I and the definitions of CAP Management Categories in Exhibit 2-1 to assign waste quantities to CAP Management Categories.

Step 6 **Reallocate waste quantities imported to transfer facilities**. Use the WR form and best professional judgement to reallocate waste quantities imported to transfer facilities to the appropriate CAP Management Categories. States should document and provide rationale for any assumptions made. WR forms with a System Type code = M141 (transfer facility storage, waste was shipped off site with no on-site TDR activity) indicate imports to transfer facilities.[13]

Step 7 **Determine quantities managed in commercial systems for each CAP Management Category**. Sum the waste quantities managed in commercial systems by CAP Management Category and place in the 'Imports' column of Table 3.

[13] If states have knowledge that waste imported to transfer facilities was ultimately exported for management, they should note this caveat in their CAP documentation.

Table 4. Maximum Operational In-state Commercial Subtitle C Management Capacity - End of 1991

Purpose. Table 4 summarizes the maximum operational in-state commercial management capacity for RCRA Subtitle C hazardous wastes by CAP Management Category. This table is derived using the PS form. If the PS form or certain data elements on the PS form are not available, states should use their commercial facilities' Part B or Part A applications or other state data. (States should include any interim status energy recovery facilities.) If a state is aware of a system with an operational status that significantly affects baseyear capacity, the state should note this status in its CAP documentation. However, changes in operational status that will affect capacity after the end of 1991 will be reflected in Table 6 (Expected Maximum In-state Commercial Subtitle C Management Capacity) and need not be documented for Table 4. States should include Commercial Capacity for Boilers and Industrial Furnaces (BIFs) into the appropriate energy recovery category.

States may also submit capacity data and information about commercial systems exempt from Subtitle C requirements that accept RCRA hazardous wastes. This optional information should be provided in a separate table or described in the text of the Phase 1 submission.

Data Elements. Table 4 is based on the following data elements from the 1991 Biennial Report or equivalent data:

PS Form
- Maximum Operational RCRA Capacity (PS.II.B)
- Commercial Capacity Availability (PS.II.F)
- Percent Capacity Commercially Available (PS.II.G)
- UOM and Density (PS.II.A)
- System Type (PS.I.B)

Instructions. Exhibit 2-10 presents a flowchart for Table 4. Five steps are necessary to produce this table.

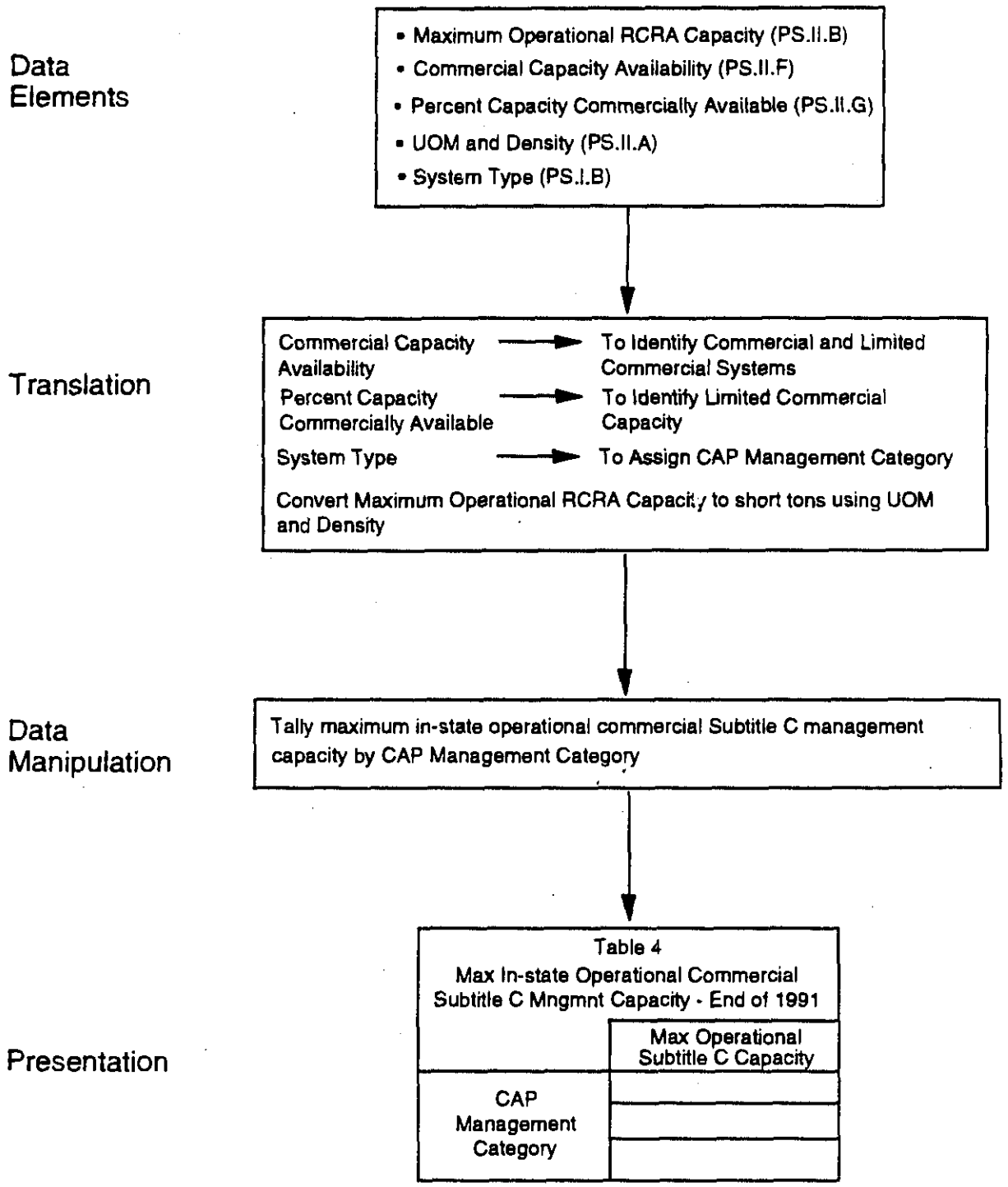
Step 1 **Identify maximum operational Subtitle C capacity**. Use the Maximum Operational RCRA Capacity, data element PS.II.B, to identify maximum operational Subtitle C capacity for the system. This data element also asks respondents for the Maximum Operational Total Capacity of the system; however, Table 4 should include only Maximum Operational RCRA Capacity.

Step 2 **Identify commercial status of system**. Use the Commercial Capacity Availability code from data element PS.II.F to identify commercial systems; Code 4 indicates management in commercial systems. For systems with Code 3 (the system is available to a limited group of generators or facilities for

Table 4:
Maximum Operational In-state Commercial Subtitle C Management Capacity - End of 1991 (tons)

CAP Management Category	Maximum Operational In-state Commercial Subtitle C Management Capacity
RECOVERY	
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
TREATMENT	
Stabilization/Chemical Fixation	
Incineration - Liquids and	
Incineration - Sludges/Solids	
Sludges Treatment	
DISPOSAL	
Landfill	
Deepwell/Underground Injection	
Land Treatment/Farming	
TRANSFER/STORAGE	
Transfer/Storage	

Exhibit 2-10
Flowchart for Table 4:
Maximum In-state Operational Commercial Subtitle C Management Capacity - End of 1991



commercial hazardous waste management), identify the capacity available for commercial management by using the percent Commercially Available (PS.II.G) or other state information. If the Commercial Capacity Availability code is missing, states should use other state information to identify the commercial status.

Step 3 **Convert maximum capacity to short tons**. Use the UOM and Density in data element PS.II.A and the conversion factors listed in Appendix E to convert maximum RCRA Subtitle C capacity to short tons.

Step 4 **Assign maximum operational Subtitle C capacity to appropriate CAP Management Categories**. Use the System Type, data element PS.I.B, and the definitions of CAP Management Categories in Exhibit 2-1 to assign maximum Subtitle C capacity to CAP Management Categories. The Transfer/Storage Category should not be used for this table.

Step 5 **Determine the maximum operational capacity for each CAP Management Category**. Sum the maximum operational in-state Subtitle C management capacity by CAP Management Category.

3. PHASE 1: PROJECTIONS

3.1 INTRODUCTION TO PHASE 1 PROJECTIONS

Introduction

This chapter describes the methods EPA recommends that states use to project the future need for commercial hazardous waste recovery, treatment, and disposal capacity. During their review of the 1989 CAP process, states requested that EPA develop such methods to ensure consistency among state projection approaches. EPA, however, will leave the actual mechanics and details to each state's discretion.

States should estimate the demand for commercial Subtitle C hazardous waste management capacity from recurrent hazardous waste expected to be generated within their borders in 1993, 1999, and 2013. States should also estimate the maximum commercial Subtitle C hazardous waste management capacity expected to be available within their borders in 1993, 1999, and 2013. These projections are explained in more detail in later sections. The 1993 CAP projections focus on commercial capacity only because it is generally expected that on-site and captive capacity will grow as needed to meet the demand for such capacity. Focusing projections on commercial hazardous waste management systems reduces the burden on states of making projections.

Projections should include the impact of EPA and state regulations that are finalized before the end of the 1992 calendar year. However, for the 1993 CAP, states do not need to adjust hazardous waste projections for the impacts of economic change. EPA made this decision based on preliminary analyses that have shown that the effects of economic changes on waste generation will be subsumed by the effects of new hazardous waste regulations and waste minimization. EPA is, however, further investigating whether a relationship exists between economic change and hazardous waste generation, and may require adjustments of hazardous waste generation by projected economic change in future CAPs.

Baseline

The previous chapter instructs states on how to compile baseyear data that describe their hazardous waste management systems in 1991. This baseyear information should be modified to produce the baseline recurrent demand and capacity data from which projections are made.

Baseline Demand

Baseline demand should include the following types of waste:

- RCRA Subtitle C hazardous waste generated in state in the baseyear;

- Treatment residuals generated from management of hazardous waste in the baseyear (section 3.2 describes in detail how residuals should be incorporated into the baseline); and

- Non-RCRA Subtitle C hazardous waste that is considered hazardous under state regulations and is managed in hazardous waste management systems.

Baseline demand should not include the following types of waste:

- One-time wastes, as EPA will develop one-time waste estimates to be used in assessing the adequacy of national capacity;

- Waste imported to the state in the baseyear, because projections should include only waste reasonably expected to be generated in the state in the baseyear;

- Waste generated by small quantity generators (SQGs);

- Non-Subtitle C hazardous waste that may use commercial Subtitle C management capacity, except for waste considered hazardous under state regulations;

- Waste disposed through discharge to a sewer/publicly owned treatment works (POTW);

- Waste disposed through direct discharge to surface waters under a National Pollutant Discharge Elimination System (NPDES) permit; or

- Mixed hazardous/radioactive waste.

To estimate the baseline recurrent demand for commercial Subtitle C hazardous waste management capacity, states should sum recurrent waste generated and managed in state in the baseyear (Table 3) and recurrent waste exported in the baseyear (Table 3), by CAP Management Category. After adjusting for treatment residuals (see section 3.2), this information should be presented in the 'Baseline' column of Table 5: Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated In State. (Copies of the projection tables are provided in Appendix C and on a diskette.)

Table 5:
Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated In State (tons)

CAP Management Category	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013
RECOVERY				
Metals Recovery				
Inorganics Recovery				
Organics Recovery				
Energy Recovery - Liquids				
Energy Recovery - Sludges/Solids				
TREATMENT				
Stabilization/Chemical Fixation				
Incineration - Liquids and Gases				
Incineration - Sludges/Solids				
Fuel Blending				
Hazardous Wastewaters and Sludges Treatment				
DISPOSAL				
Landfill				
Deepwell/Underground Injection				
Land Treatment/Farming				
TRANSFER/STORAGE				
Transfer/Storage				

Baseline Capacity

Baseline capacity is the existing operational capacity located within a state's borders. The baseyear capacity figures from Table 4 should be reflected in the 'Baseline' column of Table 6. Adjustments for capacity that has become operational or closed since 1991 or that is known to be slated for closure will be reflected in the 1993 projections. In addition, projections from the baseline will reflect a depletion of non-renewable landfill capacity. Other projected capacity amounts will be held constant.

1993 Projections

Demand and capacity estimates for 1993 are required since that is when states make the assurance of availability of capacity for 20 years from the date these assurances are made. Except as noted below, for 1993, states may hold both demand and capacity other than landfill capacity constant from the baseline. Certainly, the data should be updated if the state has knowledge of changes, especially new operational capacity, in either demand or capacity between 1991 and 1993.

1993 Demand

To project the demand for commercial waste management capacity from recurrent hazardous waste expected to be generated within their borders in 1993, states should follow two steps.

Step 1. States should separate wastes that are affected by regulatory changes from wastes that are not affected by regulatory changes. To make this separation states should compile 1991 Biennial Report data by EPA Hazardous Waste code and separate waste codes affected by regulatory change from other waste codes placing demand on commercial capacity that are not affected by regulatory changes. States may need to adjust newly listed waste quantities (i.e., EPA Hazardous Waste codes F037 and F038) to reflect a full year's worth of generation. The recommended regulatory change projection methods are given in section 3.3.

Step 2. States should apportion 1993 demand by CAP Management Categories onto Table 5. For wastes not affected by regulatory changes, states should apportion projected demand to CAP Management Categories in the same proportions as in the baseline, except where adjustments are needed. For example, states should not allocate demand on management capacity to land treatment/farming, which is disallowed under the land disposal restrictions, or to transfer/storage. Waste in these categories should be allocated to an appropriate CAP Management Category using "best engineering judgment" and methods provided in section 3.3. For instance, if a state has reason to believe that management practices will change from the baseline, it should adjust the allocation of wastes to CAP Management Categories accordingly and describe the reason for these expected changes in its CAP documentation. For wastes affected by regulatory changes, states should apportion projected generation to CAP Management Categories based on the requirements of new regulations and associated changes in hazardous waste management. The recommended regulatory change projection methods are given in section 3.3.

Table 6:
Expected Maximum In-state Commercial Subtitle C Management Capacity (tons)

CAP Management Category	Baseline	Maximum In-state Commercial Subtitle C Management Capacity		
		1993	1999	2013
RECOVERY				
Metals Recovery				
Inorganics Recovery				
Organics Recovery				
Energy Recovery - Liquids				
Energy Recovery - Sludges/Solids				
TREATMENT				
Stabilization/Chemical Fixation				
Incineration - Liquids and Gases				
Incineration - Sludges/Solids				
Fuel Blending				
Hazardous Wastewaters and Sludges Treatment				
DISPOSAL				
Landfill				
Deepwell/Underground Injection				
Land Treatment/Farming				
TRANSFER/STORAGE				
Transfer/Storage				

The 1993 demand information should be presented in the '1993' column of Table 5: Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated In State.

As noted in the discussion of the baseline demand, states will not be responsible for estimating one-time waste generation. EPA will develop national estimates of one-time waste generation that will be used in assessing the adequacy of national capacity.

1993 Capacity

To estimate the maximum available commercial Subtitle C hazardous waste management capacity expected to be available within their borders in 1993, states should follow three steps.

Step 1. Add to the baseline capacity (i.e., operational commercial capacity figures from Table 4) any commercial Subtitle C capacity that has or will become operational by the end of 1993.

Step 2. Subtract from commercial landfill capacity the amount of capacity that is estimated to be used between the end of 1991 and the start of 1993.

Step 3. Subtract from the commercial capacity figures any capacity that has closed since 1991. The information from steps 1, 2, and 3 should be reflected in the '1993' column of Table 6: Expected Maximum In-state Commercial Subtitle C Management Capacity.

If a state has any statutory limitations on the amount of waste a landfill can accept, it should provide that information to EPA. EPA will use this information in its national capacity assessment.

1999 Projections

States should project demand and capacity for 1999 to provide a reasonable basis to assure 20 years of capacity. This projection year coincides with the cycle for Biennial Reports, and is the furthest year out from the baseyear that will provide reasonable projections. This date also provides a window for tracking milestones established in Phase 2 and 3 submittals. Milestones will be tracked by the Agency through the end of 1999. For the 1993 CAP, the year 1999 will provide an ending point for milestones. Some time before 1999, the Agency will ask for new CAP updates from states that will contain milestones for another six year timeframe.

1999 Demand

To project the recurrent demand for commercial Subtitle C hazardous waste management capacity in 1999, states may assume that demand will be constant from 1993 to 1999. Thus, states may copy the information in the '1993' column to the '1999' column in Table 5. As noted above, states will not be responsible for estimating one-time waste generation.

1999 Capacity

To estimate the maximum available commercial Subtitle C hazardous waste management capacity expected to be available within their borders in 1999, states should follow two steps. (By limiting projected capacity to only those facilities that have been permitted and are operating by the time the Phase 1 submittal is prepared, states will avoid the appearance of being prejudicial in its review of permit applications.)

Step 1. For all CAP Management Categories except commercial landfill capacity, assume that capacity available in 1993 is available in 1999. However, if the state has knowledge of significant changes that will diminish commercial capacity, such as closures, states should reflect these changes in the 1999 capacity estimates. If the state knows of changes that will increase available commercial capacity, such as on-site or captive facilities coming on line and reducing the demand for commercial capacity, states should also note these changes in their 1999 capacity estimates.

Step 2. Subtract from commercial landfill capacity available at the start of 1993, as presented in the '1993' column of Table 6, the amount of such capacity that is expected to be used between the start of 1993 and the start of 1999.

States can estimate the amount of commercial landfill capacity that is expected to be used between the start of 1993 and the start of 1999 (i.e., end of 1998) using the following equation, which assumes that the average demand over the six-year period is the average of the 1993 demand and the 1999 demand:

Capacity Change = [6 x [(1993 demand + 1999 demand)/2]

For example, assume that a state projects a demand on landfill capacity of 100 tons in 1993 and 120 tons in 1999. In this case, the capacity change during the five year interval would be:

Capacity Change = [6 x [(100 + 120)/2]
Capacity Change = 660 tons

If the demand in 1993 and 1999 are equal, the change in capacity would equal six times that annual demand (held constant for each of the six years).

The change in capacity should be subtracted from the capacity figures in the '1993' column of Table 6, which represent capacity at the start of 1993, and entered in the '1999' column.

2013 Projections

Projections to the year 2013 will satisfy the requirement in CERCLA §104(c)(9) that states should assure the availability of capacity for 20 years from the date capacity assurances are made. For 2013, states may hold demand and non-landfill capacity estimates constant from 1999, because detailed 20-year projections would be too inaccurate to provide a reasonable picture of future hazardous waste management.

2013 Demand

Since states may assume the demand for commercial Subtitle C hazardous waste management capacity from hazardous waste expected to be generated within their borders in 2013 is constant from 1999, states may copy the information in the column for 1999 to the column for 2013 in Table 5: Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated In State.

2013 Capacity

For 2013, states can hold their maximum available commercial Subtitle C hazardous waste management capacity constant from 1999, excluding commercial landfill capacity. To project the decline in commercial landfill capacity from the start of 1999, as presented in the '1999' column of Table 6, to the start of 2013, states should reduce their 1999 commercial landfill capacity by 14 times their projected demand for commercial landfill in 1999. This approach is simpler than the approach for 1999 because it reflects an assumption that the demand on commercial landfill capacity will remain constant from 1999 to 2013. States should copy the information for other types of commercial Subtitle C hazardous waste management capacity in the column for 1999 to the column for 2013 in Table 6: Expected Maximum In-state Commercial Subtitle C Management Capacity.

The remainder of this chapter is organized in three sections:

Section 3.2 Treatment Residuals;
Section 3.3 Regulatory Change Projections; and
Section 3.4 Review Criteria for Projections.

The regulatory change methods in this chapter do not include adjustments for the impact of economic growth or decline on hazardous waste generation. States are not required to make economic change projections because of the difficulty of making accurate projections. Furthermore, the impact of economic change is difficult to separate from the impact of other variables, such as waste minimization and regulatory change.

3.2 TREATMENT RESIDUALS

EPA is assigning the responsibility for projecting demand and assuring capacity for secondary waste (i.e., treatment residuals) based on how the primary waste is treated.

- For three CAP Management Categories: Stabilization/Chemical Fixation, Incineration - Liquids and Gases, and Incineration - Sludges/Solids, the state with the primary waste generators will be responsible for the residuals; and

- For the remaining CAP Management Categories, the state in which the secondary waste is generated will be responsible for the residuals.

This approach has several benefits. First, allocating responsibility for residuals from stabilization and incineration to the states with the primary generators is equitable. States with stabilization and incineration capacity will not be forced to assure landfill capacity for the residuals from imported waste. This allocation of responsibility effectively requires states with the primary generator to be responsible for entire stabilization and incineration treatment trains (cradle-to-grave management), regardless of whether the residuals were generated within their borders.

Second, this approach will provide more effective waste minimization planning in the event of a national shortfall in land disposal because opportunities for significant reductions due to waste minimization are much greater at the point of primary generation, rather than the point where residuals are generated. In particular, secondary generation states that are "shortfall states" will not need to address these residuals, which typically would be addressed by siting or interstate agreements. Instead, this approach will create an incentive to reduce the amount of waste generated in the first place, which is most appropriately placed on states in which the primary waste is generated.

Third, by restricting the primary generating state's responsibility to stabilization and incineration residuals, the approach will avoid any difficulties in projecting out-of-state residuals generation from the wide range of other management categories. Furthermore, residuals from other CAP Management Categories, in certain instances, are exempt from Subtitle C management provided they meet certain criteria. For example, slag residuals generated by high temperature metals recovery would be excluded from Subtitle C disposal if they achieve the generic exclusion levels.[1]

States are responsible for projecting demand and assuring capacity for residuals from wastes imported for management by methods other than stabilization or incineration. Making

[1] 56 *Federal Register* 41164, August 19, 1991 (K061 rulemaking); 57 *Federal Register* 37194, August 18, 1992 (K062, F006 rulemaking).

projections for these wastes does not require any special adjustments because the states' baseline data include residuals generated by in-state management of imported wastes. Calculating residuals from CAP Management Categories other than stabilization and incineration would be much more difficult because the processes can vary and residual generation in other CAP Management Categories is not as well documented as stabilization and incineration.

The following text describes the approach for adjusting the baseyear data for residuals from stabilization and incineration to create the baseline data.

Calculation of Residuals from Stabilization and Incineration

This section describes how states should estimate the quantities of residuals that will be generated by recurrent wastes shipped out of state directly for stabilization or incineration. These amounts should be included in a state's baseline demand for landfill capacity. This section also describes how states should estimate the quantity of residuals from stabilizing and incinerating imported wastes, which should be excluded from demand projections. This adjustment is necessary to avoid double counting of residual wastes.

The calculations described in this section rely on import and export information from Table 3 and multiplication factors described below. If a state uses different multiplication factors, it should describe the rationale for its factors.

Capturing Residuals from Exported Wastes

Residuals from exported recurrent waste should be added to baseline demand projections by using three steps.

Step 1. A state should identify from Table 3 the amount of its primary or in-state generated secondary recurrent waste that was shipped out of state in 1991 for Stabilization/Chemical Fixation, Incineration - Liquids and Gases, and Incineration - Sludges/Solids.

Step 2. Unless a state can document more appropriate multipliers, the waste quantities identified in step 1 should be multiplied as follows:

- Stabilization by 1.5 to represent a demand on commercial landfill capacity;
- Incineration - Liquids and Gases by 0.15 to represent the demand on landfill capacity; and
- Incineration - Solids/Sludges by 0.225 to represent the demand on landfill capacity.

These factors, while not applicable to all waste streams that are stabilized or incinerated, are reasonable mid-range assumptions or averages for planning purposes. They reflect analysis

of the residual generation from a variety of waste types using various technologies in each CAP Management Category.

Step 3. The resulting demands on landfill capacity should be included within the state's projected baseline demand in Table 5. Residuals resulting from one-time wastes will be provided to the states by EPA and added to the baseyear and respective projection years during the national aggregation.

Eliminating Residuals from Imported Wastes

The steps for eliminating residuals from imported wastes are the same as those described above for adding residuals from exported wastes with three exceptions: (1) states should use import rather than recurrent export data from Table 3; (2) states should subtract, rather than add, the calculated demand by residuals on landfill capacity from their other demand projections in Table 5; and (3) states need to differentiate between recurrent and one-time wastes using information based on Form code rather than Origin code, as the WR form of the 1991 Biennial Report does not have an Origin code.

Illustration

Using the Biennial Report or other information (e.g., knowledge of the importers), states should divide imports into recurrent and one-time wastes. For example, states can assume that all imports with Form codes for contaminated soils (i.e., B301-B302) and contaminated debris (i.e., B002, B307-B311, and B406) are one-time wastes and that all other wastes are recurrent. Assume, for purposes of illustration, that State A has identified in Table 3 the following import and export amounts:

	Recurrent Exports from State A	Recurrent Imports to State A
Stabilization/Chemical Fixation	3,000 tons	1,500 tons
Incineration - Liquids and Gases	0 tons	4,000 tons
Incineration - Solids/Sludges	1,000 tons	4,000 tons

By accounting for recurrent exports, State A's demand on landfill capacity will increase by 4,725 tons: (3,000 tons of waste stabilized x 1.5) + (1,000 tons of solids/sludges incinerated x 0.225). By accounting for imports, State A's demand on landfill capacity will decrease by 3,750 tons: (1,500 tons stabilized x 1.5) + (4,000 tons of liquids and gases incinerated x 0.15) + (4,000 tons of solids/sludges incinerated x 0.225). Thus, State A should reflect in Table 5 an increased demand on landfill of 975 tons (4,725 - 3750) in its baseline demand for landfill capacity.

3.3 ACCOUNTING FOR REGULATORY CHANGE

Introduction

CAP projections should incorporate recent regulatory changes whose impacts are not reflected in the baseyear data (e.g., 1991 Biennial Report data). Because the effects of proposed regulations that have not been finalized are difficult to predict, states are not required to consider regulations that have not been promulgated by the time this Guidance is issued. States should project the capacity implications for any changes in either state or federal regulations. The only federal regulations that states should incorporate into future demand, however, are the changes in the land disposal restrictions (LDRs), as described below. Although not required, states are strongly urged to consider whether the Burning of Hazardous Waste in Boilers and Industrial Furnaces (BIF) Rule and new RCRA waste listings, other than F037 and F038 wastes, will affect their hazardous waste management system. (As described in Regulatory Change Projection Method below, states should incorporate the effects of F037 and F038 wastes in their CAP projections.)

States are responsible for considering the impacts of only the Phase I LDRs (57 *Federal Register* 37194, August 18, 1992) and expired LDR capacity variances for certain wastes. These LDR regulations need to be included in the analysis since they were promulgated before the issuance of this Guidance, but their full impact is not reflected in the 1991 Biennial Report data because they became effective after the start of 1991. These regulations were chosen specifically because they may entail significant changes in Subtitle C hazardous waste generation and management, as they require treatment of waste previously sent directly to landfills.

The land disposal restrictions program is scheduled to promulgate two more significant rulemakings. While the LDR treatment standards for the new toxicity characteristic (TC) wastes (i.e., EPA Hazardous Waste codes D018-D043) and mineral processing wastes have not been promulgated, states should be aware that these are very large volume waste streams. EPA hopes that states will use the 1993 CAP as an opportunity to anticipate how these wastes might affect their treatment and disposal capacity.

States should also be aware of the continuing effects on hazardous waste management of the Burning of Hazardous Waste in Boilers and Industrial Furnaces (BIF) Rule and new RCRA Subtitle C waste listings (e.g., wood preserving wastes: F032, F034, and F035). While the Guidance does not require states to account for the impact of the BIF rule or these new listings, states may want to anticipate the effect that the regulations may have on Subtitle C hazardous waste generation and management in their state. Appendix F contains information on the BIF rule and Phase II and III LDR rulemakings. EPA is providing this information to states to alert them to changes in regulations that will have to be reflected in future CAPs.

The remainder of this section is organized in two parts:

(1) Background on land disposal restrictions; and
(2) Regulatory change projection method.

Land Disposal Restrictions

When making projections for their 1993 CAPs, states should account for certain land disposal restrictions (LDRs) that will affect Subtitle C hazardous waste management between 1991, the year for which the most recent Biennial Report data were collected, and 2013. Adjustments may be needed for the following two recent developments under the LDR program:

(1) Expiration of national capacity variances granted for some wastes restricted under the First, Second, and Third Third LDR rules; and

(2) Phase I LDRs for newly listed or identified wastes and contaminated debris.

The Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) restrict the land disposal[2] of RCRA Subtitle C hazardous wastes. The land disposal of specified hazardous wastes is restricted unless (1) the wastes are treated to a level or by a method specified by EPA, or (2) it has been demonstrated that there will be no migration of hazardous constituents from the land disposal unit for as long as the waste remains hazardous. LDR treatment standards specify either the technology that must be used prior to land disposal or the constituent concentration levels that must be met prior to land disposal.

1991 Biennial Report data should already account for treatment of hazardous wastes subject to LDRs that became effective prior to 1991 (i.e., the Solvents and Dioxins, California List, First Third, Second Third, and Third Third rules). 1991 Biennial Report data will not, however, accurately reflect the future management of First, Second, and Third Third wastes whose national capacity variances expired between January 1991 and May 1992 and petroleum refining wastes that were listed as hazardous effective in May 1991[3] and were restricted from land disposal as a result of the Phase I LDRs published on August 18, 1992.[4]

Regulatory change projections are necessary because the LDRs for these wastes are not entirely reflected in the 1991 Biennial Report data. States are required to consider only the wastes affected by the rulemakings that are specifically discussed in this Guidance.

---

[2] For the purpose of the restrictions, HSWA defines land disposal to include any placement of hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, or underground mine or cave (42 U.S.C. 6924(k)).

[3] 55 *Federal Register* 46354, November 2, 1990.

[4] 57 *Federal Register* 37194, August 18, 1992.

Projections of the future generation and management of contaminated soil and debris will be accounted for through EPA's one-time waste estimates.

National Capacity Variances Under First, Second, and Third Third LDR Rules

The First, Second, and Third Third rules defined LDRs for hundreds of RCRA hazardous wastes. Of these, 40 specific wastes were granted national capacity variances that expired either June 8, 1991 or May 8, 1992.[5] National capacity variances expired on June 8, 1991 for the underground injection of four specific First and Second Third wastes. These wastes will require treatment meeting LDR standards by 2013, but the increased demand for treatment capacity will not be fully reflected in baseline data. Exhibit 3-1 identifies 15 high-volume waste streams with national capacity variances that expired on May 8, 1992. (States do not have to consider relatively low-volume waste streams in their CAP regulatory projections.) In addition, Exhibit 3-1 shows the "best demonstrated available treatment" (BDAT) for each waste and, in parentheses, the CAP Management Category to which the treatment is assigned.

Phase I LDRs for Newly Listed Wastes and Contaminated Debris

Published August 18, 1992, the Phase I LDR rule established treatment standard for certain newly listed wastes and contaminated debris.[6] Exhibit 3-2 identifies the proposed best demonstrated available treatments for certain wastes that will be affected by these restrictions. EPA promulgated a two-year national capacity variance for debris contaminated with Phase I wastes because the treatment capacity available for contaminated debris is very limited. This limitation is due to the very large quantities of debris contaminated with previously listed wastes that will require treatment when earlier national capacity variances expire. Projections of the future generation and management of contaminated soil and debris will be accounted for through EPA's one-time waste estimates.

Of the newly listed wastes, LDRs for petroleum refinery wastes (F037 and F038) will have the most significant effect on commercial hazardous waste management capacity. Except for one facility in Arkansas that generates ethylene dibromide wastes (K118), the only Phase I wastes expected to require significant commercial treatment or recovery capacity are petroleum wastes. Relatively low-volume Phase I waste streams, which are not listed in Exhibit 3-2, do not have to be considered by states in their CAPs.

---

[5] 55 *Federal Register* 3912, January 31, 1991.

[6] 57 *Federal Register* 37194, August 18, 1992.

Exhibit 3-1
Wastes with Expired National Capacity Variances

EPA Hazardous Waste Code	Description	Treatment Standard	Best Demonstrated Available Treatment (BDAT)	Source
D002[b]	Corrosive wastewater and nonwastewater	Deactivation to remove corrosivity	Deactivation (wastewater/sludge treatment[a])	55 FR 22520
D003[b]	Reactive sulfide wastewater and nonwastewater	Concentration-based	Deactivation (wastewater/sludge treatment[a])	55 FR 22520
D004[c]	Arsenic nonwastewater	Concentration-based	Vitrification (stabilization/chemical fixation)	55 FR 22520
D007[c]	Chromium wastewater and nonwastewater	Concentration-based	Chrome reduction followed by chemical precipitation (wastewater/sludge treatment[a])	55 FR 22520
D009[b,c]	High mercury nonwastewater	Technology-based	Retorting (metals recovery)	55 FR 22520
F007[c]	Spent cyanide plating bath solutions from electroplating operations	Concentration-based	Wet-air oxidation or alkaline chlorination followed by chemical precipitation (wastewater/sludge treatment[a])	54 FR 26594
F039[b,c]	Multi-source leachate wastewaters and nonwastewaters	Concentration-based	Biological treatment followed by chemical precipitation (wastewater/sludge treatment[a]) for wastewaters or incineration-sludges/solids followed by stabilization (stabilization/chemical fixation) for nonwastewaters	55 FR 22520
K009[b]	Wastewater distillation bottoms from the production of acetaldehyde from ethylene	Concentration-based	Steam-stripping followed by biological treatment (wastewater/sludge treatment[a])	54 FR 26594
K011, K013[b]	Nonwastewater from acrylonitrile production	Concentration-based	Incineration - sludges/solids	54 FR 26594
K011, K013[b]	Wastewater from acrylonitrile production	Concentration-based	Wet-air oxidation (wastewater/sludge treatment[a])	55 FR 22520
K014[b,c]	Wastewater and nonwastewater from acrylonitrile production	Concentration-based	Wet-air oxidation (wastewater/sludge treatment[a])	55 FR 22520
K016[b]	Heavy ends or distillation residues from carbon tetrachloride production	Concentration-based	Incineration - liquids for wastewaters or biological treatment followed by wet-air oxidation for nonwastewaters (wastewater/sludge treatment[a])	53 FR 31138
K031[c]	Salts from MSMA and cacodylic acid production	Concentration-based	Vitrification (stabilization/chemical fixation)	55 FR 22520
K084[c]	Sludges from veterinary pharmaceutical production from arsenic compounds	Concentration-based	Vitrification (stabilization/chemical fixation)	55 FR 22520

[a] Hazardous wastewaters and sludges treatment [b] Received variance for deepwell injected wastes. [c] Received variance for surface disposed wastes.

Exhibit 3-2
Phase I Newly Listed Wastes

EPA Hazardous Waste Code	Description	Treatment Standards	Best Demonstrated Available Treatment
F037, F038	Petroleum refinery wastewater	Concentration-based	Biological treatment and chemical precipitation of metals (wastewater/sludge treatment[a])
	Petroleum refinery nonwastewater	Concentration-based	Solvent extraction or thermal desorption (wastewater and sludge treatment[a]), incineration of organics, stabilization of metals
K118	Ethylene dibromide wastewater	Concentration-based	Incineration - liquids

[a] Hazardous wastewaters and sludges treatment

Regulatory Change Projection Method

For hazardous wastes that will be affected by recent regulatory changes, baseline data will not provide an accurate basis for projecting future waste generation and management. States should consider generation and management of wastes affected by regulatory changes in their 1993 projections. EPA encourages all states, for the sake of national consistency, to follow the basic analytic steps described below to assist in such projections. In addition to using the Biennial Report as described below, states may want to gather information for these projection steps by interviewing or surveying facilities that generate and/or manage wastes affected by regulatory changes. Additionally, states may wish to contact their EPA Regional CAP Coordinators to obtain the Background Documents for the Phase I rule, which contain facility-specific waste generation information.

Step 1 **Separate waste quantities affected by recent LDR requirements from other projection data.**

Step 2 **Determine the quantity of these wastes generated in 1991.**

Step 3 **Identify how these wastes and their residuals will be managed in 1993 and their demand on commercial capacity.**

Step 1. Separate hazardous waste quantities (provided on 1991 Biennial Report forms) that are affected by recent LDR requirements. These wastes should be separated so that they are not counted twice in projections. Separate waste quantities that have the following EPA Hazardous Waste codes in combination with System Type codes that indicate disposal. Using Biennial Report Form GM identify waste streams with:

- EPA Hazardous Waste codes F037, F038, F039, F007, K009, K011, K013, K014, K016, K118, D002, D003, D004, D007, D009, K031, and K084 (GM.I.B); and

- System Type codes M131, M132, M133, M134, and M137, which indicate disposal (GM.II or GM.III).

This approach assumes that only the waste streams that were disposed in 1991, rather than treated, will need to be redistributed to treatment categories for projections.

The distinction between wastewaters and nonwastewaters should be maintained for each waste code because these waste streams are subject to different treatment standards. Using the Biennial Report, this distinction can be derived from the Form codes (GM.I.H) for liquids (B101-B119, B201-B219), solids (B303-B306, B312-B319, B401-B405, B407-B409), and sludges (B501-B519, B601-B609).

Future generation and management of soil or debris contaminated with the above wastes will be accounted for through EPA's one-time waste estimates. Soil and debris can be segregated from other waste streams using Biennial Report Form codes B301-B302 for contaminated soil and B002, B307-B311, and B406 for contaminated debris.

Step 2. Determine the quantity of these wastes generated at each facility in 1991. For all wastes except petroleum refinery sludges (F037 and F038), use quantities as reported in GM.II for on-site systems or GM.III.E for commercial and captive facilities. Because petroleum refinery wastes (F037 and F038) were listed as hazardous for only eight months (i.e., two-thirds) of 1991, the 1991 Biennial Report data is likely to underestimate the annual generation of these wastes. States therefore need to adjust 1991 generation of F037 and F038 petroleum wastes to represent a full year's worth of generation. To estimate annual F037 and F038 generation, states could multiply 1991 Biennial Report generation quantities by 1.5 or obtain facility-specific data from state sources.

Step 3. Identify the CAP Management Categories in which these wastes and their residuals will be managed in 1993 and their demand on commercial capacity. First, to identify the relevant CAP Management Categories, identify the LDR treatment standards that EPA has specified for the waste.

- If EPA has promulgated a specific treatment technology as the LDR standard, then generation in the projection year should be assigned to that specific treatment method (e.g., retorting (metals recovery) should be used to treat D009 nonwastewaters). States should use the treatment method listed in Exhibits 3-1 and 3-2 for wastes that have a specific technology as the treatment standard.

- If, however, EPA has promulgated concentration levels as the LDR standard, then any technology capable of meeting the treatment standard can be used to manage these wastes. EPA, however, attempted to group technologies that can achieve similar levels of performance into the same CAP Management Categories. States should be aware that not all wastes can be recovered for technical reasons; therefore if it is not known that the wastes can be recovered, it should be assigned to a management category lower on the hierarchy (i.e., incineration). States can assign wastes that have concentration levels as the treatment standard either to the technology used as the

basis for that standard or to an alternative technology that meets the standard. States should document assumptions and rationale used to assign wastes to CAP management categories especially if the waste management method was not the determined BDAT.

Second, estimate the generation of hazardous waste residuals from treatment of the wastes that require incineration or stabilization to determine the impact on landfill capacity. As described in section 3.2, states should multiply the quantities of primary or in-state generated secondary wastes affected by recent LDR requirements by:

- 1.5 for wastes requiring Stabilization/Chemical Fixation;
- 0.15 for wastes requiring Incineration - Liquids and Gases; and
- 0.225 for wastes requiring Incineration - Sludges/Solids.

For example, ash resulting from combustion of F037 and requiring Subtitle C landfilling is approximately 22.5 percent (0.225) of the original F037 waste quantity.

Third, determine whether wastes, including residuals from incineration and stabilization, will impose a demand on Subtitle C commercial capacity. States may either assume that all the wastes will be managed in commercial facilities or determine whether appropriate on-site or captive waste management capacity is available for managing particular wastes, including residuals. If a state uses the latter approach and on-site or captive capacity is available, waste and residual quantities should be reflected in the 1993 demand on commercial capacity only to the extent that the quantities exceed the available on-site or captive capacity.

As a final step, states should add the waste quantities by CAP Management Categories to other wastes that were not affected by regulatory change adjustments to get a total demand for 1993.

3.4 REVIEW CRITERIA FOR PROJECTIONS

EPA is providing the following checklists to assist states in developing their projections. EPA will also use these checklists as criteria to evaluate the reasonableness and completeness of state projections.

1. **Do the projections account for any significant changes in state regulations that became effective after the start of 1991?**

   ☐ Yes, projections have been adjusted for state regulatory changes. (Describe the regulatory changes and adjustments.)

   ☐ No, such changes have not occurred.

   ☐ No, such changes have occurred but the projections have not been adjusted. (Attach explanation.)

2. **Have the baseyear data been adjusted to create a baseline?**

   Are the types of wastes included in the baseline consistent with the instructions on pages 3-1 and 3-2?

   ☐ Yes.
   ☐ No. (Attach explanation.)

   Does baseline demand exclude imports and include exports?

   ☐ Yes.
   ☐ No. (Attach explanation.)

3. **Does the baseline demand incorporate adjustments for treatment residuals?**

   Have residuals from wastes exported for Stabilization/Chemical Fixation, Incineration - Liquids and Gases, and Incineration - Solids/Sludges been included in the baseline?

   ☐ Yes.
   ☐ No. (Attach explanation.)

   Have residuals from wastes imported for Stabilization/Chemical Fixation, Incineration - Liquids and Gases, and Incineration - Solids/Sludges been excluded from the baseline?

   ☐ Yes.
   ☐ No. (Attach explanation.)

Have residual multiplication factors of 1.5, 0.15, and 0.225 been used for Stabilization/Chemical Fixation, Incineration - Liquids and Gases, and Incineration - Solids/Sludges, respectively?

☐ Yes.
☐ No. (Attach rationale for using other factors.)

Are residuals from other CAP Management Categories included in the baseline demand?

☐ Yes.
☐ No. (Attach explanation.)

4. Have demand and capacity been projected for 1993, 1999, and 2013?

Does the projected 1993 demand reflect any changes other than for regulatory change? (See question 5 on regulatory change.)

☐ Yes. (Attach explanation of the changes and the reasons for them.)
☐ No.

Is the projected 1999 demand the same as the 1993 demand?

☐ Yes.
☐ No. (Attach explanation of the changes and the reasons for them.)

Is the projected 2013 demand the same as the 1999 demand?

☐ Yes.
☐ No. (Attach explanation of the changes and the reasons for them.)

Do the 1993, 1999, and 2013 capacity projections deplete landfill capacity using the formulas described in section 3.1?

☒ Yes.
☐ No. (Attach explanation.)

Is the projected capacity for all other CAP Management Categories constant for all projection years?

☒ Yes.
☐ No, new capacity has become operational. (Identify the new capacity.)
☐ No, existing capacity has closed. (Identify the closed capacity.)
☐ No, existing capacity is scheduled to close. (Identify the capacity to be closed and the reason for closure.)
☐ No, for other reasons. (Attach explanation.)

Does the state have any statutory limitations on the amount of waste a landfill can accept?

- ☒ Yes.
- ☐ No. (Attach explanation.)

5. **Do your 1993 projections account for the effect of expired national capacity variances and Phase I LDRs on hazardous waste management?**

- ☐ Yes, for both expired variances and Phase I LDRs. (Attach description of data sources used to make projections.)
- ☐ No, projections for expired variances were not made. (Provide rationale below.)
- ☐ No, projections for Phase I newly listed wastes were not made. (Provide rationale below.)

Explain the rationale for excluding special LDR projections.

- ☐ There are no facilities in our state that generate wastes affected by expired LDR capacity variances.
- ☐ There are no facilities in our state that generate newly listed wastes affected by Phase I LDRs. (Stop here.)
- ☐ Our state has facilities that generate wastes that are addressed in the LDR developments, but generation and management of these wastes is not expected to change between 1991 and 2013 due to LDRs. (Attach explanation and stop here.)
- ☐ Other rationale. (Attach explanation and stop here.)

6. **The remaining questions focus on how your state conducted steps 2 and 3 of the regulatory change projection method and the results that were obtained for the LDRs.**

Step 2 Determine the quantity of these wastes generated in 1991, by EPA Hazardous Waste code.

What quantity of wastes affected by LDRs do you estimate were generated in your state in 1991? If 1991 was not used as the baseyear, report what baseyear was used.

EPA Hazardous Waste Code	Quantity (tons)
D002	
D003	
D004	
D007	
D009	
F007	
F037	
F038	
F039	
K009	
K011 - Wastewater	
K011 - Nonwastewater	
K013 - Wastewater	
K013 - Nonwastewater	
K013	
K014	
K016	
K031	
K084	
K118	
Total	

What data source(s) were used to estimate this generation?

☐ 1991 Biennial Report forms.
☐ Other. (Attach citation and description.)

Step 3 **Identify how and in what types of facilities these wastes and their residuals will be managed in 1993.**

What data sources were used to apportion future generation to specific CAP Management Categories?

☐ BDATs identified in this Guidance.
☐ 1991 Biennial Report forms.
☐ Other. (Attach citation and description.)

What data sources were used to estimate the generation and management of treatment residuals?

☒ 1991 Biennial Report forms.
☐ Other. (Attach citation and description.)

What data sources were used to apportion future generation to specific facility types?

☐ 1991 Biennial Report forms.
☐ Other. (Attach citation and description.)

Indicate in the table below how wastes that are affected by LDRs were allocated to CAP Management Categories for 1993 projections. Indicate subtractions from a CAP Management Category using parentheses.

CAP Management Category	Quantity (tons)
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
Stabilization/Chemical Fixation	
Incineration - Liquids and Gases	
Incineration - Sludges/Solids	
Fuel Blending	
Hazardous Wastewaters and Sludges Treatment	
Landfill	
Deepwell/Underground Injection	

4. PHASES 2 AND 3: ADDRESSING SHORTFALLS

4.1 INTRODUCTION TO ADDRESSING SHORTFALLS

Introduction

After states deliver their Phase 1 submittals, EPA will aggregate demand and capacity at the national level to determine if sufficient RCRA Subtitle C hazardous waste management capacity exists nationwide for the 20-year projection period. As described in Chapter 1, EPA will identify national shortfalls by comparing total projected national demand for a CAP Management Category (for a given CAP Management Category, projected recurrent waste demand minus 10 percent for waste minimization plus projected demand for one time waste equals projected national demand) to the projected national capacity for that CAP Management Category. If adequate capacity exists nationwide for all CAP Management Categories, EPA will not require Phase 2 or 3 documentation from any state.

Phase 2

If national demand exceeds national capacity for any CAP Management Category, EPA believes that a national shortfall may exist and will identify the states that should address the potential shortfall in Phase 2 of the CAP process. EPA will identify all "shortfall categories" and all states with demand exceeding supply in each of these categories. EPA will notify these states by letter that they should submit Phase 2 CAP submissions. (States that do not have to address any national shortfalls (i.e., states with sufficient capacity in each shortfall category) will also be notified of this fact by letter.) These submissions should include the following information for each shortfall category in which the state has a shortfall:

- Waste minimization plans for states submitting more than a 10 percent waste minimization projection, including any interstate agreements for collective waste minimization planning, as described in sections 4.2 and 4.4; and

- In-state commercial capacity that is permitted but not yet operational or that has been issued a draft permit.

In addition, submissions should contain milestones by which waste minimization projections will be achieved, nonoperational permitted capacity will become operational, and capacity with a draft permit will be permitted. States submitting interstate agreements for collective waste minimization plans will also be responsible for submitting and meeting individual state milestones.

In Phase 2, states are not responsible for a specific amount of the shortfall, rather they should provide EPA with information on new capacity, as described above, and a best estimate of waste minimization efforts. The waste minimization estimates will be used by EPA to develop a better indication of the amount of waste reduction that can be achieved through waste minimization. EPA will apply the new waste minimization and capacity data to the

previous national aggregation, retaining the previous 10 percent waste minimization reduction for states that do not prepare Phase 2 submissions and thereby revise the national aggregation.

Phase 3

After receiving the Phase 2 submittals, EPA will reexamine each of the "shortfall categories", taking into consideration the Phase 2 submittals. If adequate capacity exists in all categories, Phase 3 submissions will not be required. If national shortfalls are still projected for any CAP Management Category, EPA will identify those states that should address the remaining shortfalls. These states are hereafter referred to as "shortfall states." Shortfall states will be assigned a portion of the net shortfall based on their demand for the CAP Management Category. A net shortfall in a CAP Management Category would be the difference between:

- Projected national demand reduced by the waste minimization projections from Phase 2; and
- Projected national capacity, including the capacity identified in Phase 2 that is permitted but not yet operating or that has a draft permit.

This number would reflect the projected lack of capacity in the nation for a particular CAP Management Category. The methods EPA will use to identify shortfall states and to determine the portion of the national shortfall that each shortfall state should address are discussed later in this chapter.

EPA will identify shortfall states that should proceed to Phase 3 and notify these states by letter. EPA's notification letter will also identify the portion of the national shortfall amount(s) for which the state should assure capacity. The procedure for apportioning each state's share of the national shortfall amount is presented on page 4-4. After EPA receives Phase 2 submittals, EPA will issue a report that identifies shortfall states and summarizes the revised national capacity situation. States participating in Phase 2 that do not have to address the shortfall(s) in Phase 3 will also be notified of this fact by letter.

Each shortfall state should deliver a Phase 3 CAP submittal that outlines the steps the state will take to assure capacity for its portion of the national shortfall. In particular, milestones should be submitted to EPA indicating time frames for the approach that the state will take to assure capacity. States can address their portion of the national shortfall through:

- Increased waste minimization;
- Interstate agreements concerning increased waste minimization projections;
- Development of new capacity; and/or
- Interstate agreements concerning the development of new capacity.

Unlike the 1989 CAP process, the interstate agreements will not allocate existing capacity among states because the shortfall determination indicates that existing capacity cannot adequately address the projected demand for a CAP Management Category. Instead, these interstate agreements should focus on the development of new capacity or waste minimization efforts that exceed those submitted in Phase 2.

The Phase 2 and 3 CAP submittals should be accompanied by a letter from the Governor, or his/her authorized designee, indicating the state's commitment to the activities and milestones included in the Phase 2 and/or 3 CAP submittal. Suggested transmittal letters are included in section 1.3. These submittals should be sent to the appropriate EPA Region for review and monitoring of milestones.

Identifying Phase 3 "Shortfall States"

To identify those states required to submit Phase 3 CAPs, EPA will conduct two evaluations using the results from the Phase 1 national supply and demand aggregation and the Phase 2 submissions.

- First, EPA will examine each state's projected demand and commercial capacity in 2013 for any CAP Management Category that has a national shortfall. Any state whose demand is more than its commercial capacity for a CAP Management Category will be considered a shortfall state, unless it is exempted under the second evaluation. (This analysis will later be referred to as evaluation #1.)

- Second, EPA will examine each state's aggregate projected demand and commercial capacity for the year 2013 for three CAP Management Categories that are costly and difficult to permit: (1) incineration of liquids/gases, (2) incineration of sludges/solids, and (3) landfill. Any state whose aggregate demand is less than its aggregate commercial capacity for incineration and landfill will qualify for an exemption from submitting Phase 3 documentation. (This analysis will later be referred to as evaluation #2.)

Under the second evaluation, states that provide surplus combined incineration and landfill capacity are exempt from addressing any other shortfalls in Phase 3. EPA has included this exemption as a means of incorporating equity into the CAP process: both incineration and landfill management are extremely controversial. In addition to the political aspects associated with siting of incinerators and landfills, states incur substantial burdens in the development of landfill or incineration facilities even though they generally do not design, build, own, or operate the facilities. For example, states are responsible for carefully evaluating proposed sites; reviewing and specifying proposed facility designs, operational plans, and other permit conditions; and conducting compliance monitoring and enforcement activities. The permitting process may be particularly intense and often requires many public hearings, as well as public education and public outreach programs. These activities are generally more intense for incineration and landfill facilities than other types of capacity (e.g., stabilization, treatment in tanks, or fuel blending).

Although incinerators and landfills may be the most controversial CAP Management Categories where equity arguments are involved, EPA does not want to de-emphasize the importance of recovery technologies, which may reduce the burden on landfills and incineration. EPA, however, is not exempting states with surplus recovery capacity from Phase 3.

Each shortfall state should submit a Phase 3 CAP submittal that assures capacity for its portion of the national shortfall through documentation (e.g., milestones) of projected in-state capacity, increased waste minimization efforts, development of new capacity, and/or interstate agreements.

Assigning Portions of National Shortfall Amounts

After incorporating the waste minimization reductions and new capacity data from Phase 2 submissions, EPA will determine each shortfall state's portion of the projected national shortfall amount (i.e., national demand minus national supply). These allocations will be based on the shortfall state's proportionate contribution to the national shortfall amount relative to the other shortfall states. Shortfall portions will be calculated in four steps.

- First, EPA will calculate the national shortfall amount by subtracting the total national demand from the total national supply for a shortfall management category.

- Second, EPA will determine the aggregate net demand of shortfall states by summing the net demand of all shortfall states. (Each state's net demand is its individual shortfall, that is, its demand minus supply after incorporating Phase 2 waste reductions and capacity changes.)

- Third, percentages will be calculated for each shortfall state by dividing each state's net demand by the aggregate net demand for all shortfall states.

- Fourth, EPA will determine the shortfall amount that each shortfall state should address by multiplying the state's percentage by the national shortfall amount.

Although it is theoretically possible that the national shortfall amount could exceed the aggregate net demands of shortfall states, in no case will a state be responsible for an amount of the national shortfall exceeding its net demand. This situation could arise when states with a net demand (i.e., demand exceeding capacity) in a CAP Management Category are not considered shortfall states because they have surplus combined landfill and incineration capacity. For example, assume that in a three-state nation, state X has a net demand or shortfall of 1,000 tons; state Y has a net demand of 1,000 tons; and state Z has a net supply or surplus of 500 tons. The national shortfall amount would be 1,500 tons. If state Y has a surplus in combined landfill and incineration capacity, then only state X would be a shortfall state. Without the stipulation, state X would be responsible for 100 percent of the national shortfall amount of 1,500 tons, which exceeds its net demand of 1,000 tons. If this

scenario occurs, the Agency will reevaluate the methodology used to identify those states that address the shortfall and submit Phase 3 information.

Illustration

This example illustrates how EPA will decide which states should address shortfalls and how EPA will calculate the portion of the national shortfall that each shortfall state would need to address. Exhibits 4-1 and 4-2 present a hypothetical national aggregation after Phase 1 and Phase 2 have been completed for a "country" consisting of five states. There is a national shortfall in two CAP Management Categories: (1) incineration sludges/solids, and (2) landfill.

Identifying "Shortfall States"

To determine which states should address the shortfall management categories, EPA will first compare state capacity to state demand in the shortfall categories (evaluation #1). See Exhibit 4-1 for demand and supply information. Next, during the second evaluation, EPA will compare a state's aggregate landfill and incineration capacity versus its aggregate demand for incineration and landfills. States with more aggregated demand than aggregated capacity should address the shortfall. Those states that have excess shortfall management capacity or excess of the combination of landfill and incineration management capacity, do not have to address the shortfall. For this example, the results of such an aggregation are presented in the exhibits.

States that should address the incineration shortfall are States C and D because they have neither adequate incineration capacity (evaluation #1) nor enough combined landfill and incineration capacity (evaluation #2) to meet their own demands. The landfill shortfall will be addressed by States B, C, D, and E, since these states have neither adequate landfill capacity nor excess combined landfill and incineration capacity.

Assigning Portions of National Shortfall Amounts to Shortfall States

After the shortfall states have been identified, EPA will assign to each shortfall state the responsibility to assure capacity for a portion of the national shortfall amount. EPA will make this assignment in four steps for each shortfall management category:

- Step 1 calculates the national shortfall amount. The total national demand is subtracted from the total national supply for the management category. Thus, shortfall states will address the national shortfall amount, including the portion of the shortfall due to states that have individual in-state shortfalls, but that were not identified as shortfall states because they have a surplus in combined incineration and landfill.

- Step 2 calculates the total net demand which only the shortfall states place on the shortfall category. This step adds all the individual shortfall amounts of the identified shortfall states.

Exhibit 4-1
Shortfall Example

CAP Management Category	State A		State B		State C		State D		State E		Total		Shortfall
	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	Demand	Supply	
RECOVERY													
Metals Recovery	100	100	200	100	0	200	100	100	200	100	600	600	No
Inorganics Recovery	0	0	0	0	0	0	100	300	0	0	100	300	No
Organics Recovery	100	100	200	100	0	400	200	300	400	100	900	1,000	No
Energy Recovery - Liquids	200	100	0	100	0	0	200	400	100	0	500	600	No
Energy Recovery - Sludges/Solids	100	0	100	0	100	0	0	600	100	0	400	600	No
TREATMENT													
Stabilization & Chemical Fixation	600	1,600	200	0	100	0	400	200	800	1,000	2,100	2,800	No
Incineration - Liquids and Gases	400	600	100	600	200	100	300	0	200	100	1,200	1,400	No
Incineration - Sludges/Solids	500	0	100	1,000	1,200	0	300	0	500	1,000	2,600	2,000	Yes
Fuel Blending	0	0	400	0	200	1,000	0	0	300	500	900	1,500	No
Hazardous Wastewater & Sludge Treatment	1,000	1,000	0	0	100	500	200	200	0	0	1,300	1,700	No
DISPOSAL													
Landfill	1,000	4,000	1,500	0	1,500	0	1,000	0	2,000	1,000	7,000	5,000	Yes
Deepwell Underground Injection	100	200	200	100	0	0	100	100	0	200	400	600	No

Exhibit 4-2
Hypothetical National Aggregation for a Five State "Country"

State	Evaluation 1		Evaluation 2	Identification of Shortfall States	
	Incineration Sludges/Solids Capacity	Landfill Capacity	Combination Capacity Incineration/ Landfill	Need to Address Incineration Shortfall	Need to Address Landfill Shortfall
A	NO	YES	YES	NO	NO
B	YES	NO	NO	NO	YES
C	NO	NO	NO	YES	YES
D	NO	NO	NO	YES	YES
E	YES	NO	NO	NO	YES

- To calculate the proportion factor for a shortfall state, Step 3 divides the state's net demand for the shortfall category by the total net demand of the shortfall states from Step 2. Basically, this calculation reveals the percentage a shortfall state contributes to the aggregated net demand on a CAP Management Category relative to other shortfall states.

- Finally, Step 4 determines each state's shortfall responsibility by multiplying the proportion factor from Step 3 by the national shortfall from Step 1.

Incineration Sludges/Solids Shortfall (example calculation)

Step 1 (National shortfall amount = 2,000 - 2,600 = (-)600 tons)

State	**Step 2** Net Demand Amount	**Step 3** Proportion Factor	**Step 4** Portion of Shortfall That Should Be Addressed
State C	1,200	1,200/1,500 = 0.8 or 80%	(0.8)(600) = 480 tons
State D	300	300/1,500 = 0.2 or 20%	(0.2)(600) = 120 tons
Total Net Demand From Shortfall States	1,500		

Landfill Shortfall (example calculation)

Step 1 (National shortfall amount = 5,000 - 7,000 = (-)2,000 tons)

State	**Step 2** Net Demand Amount	**Step 3** Proportion Factor	**Step 4** Portion of Shortfall That Should Be Addressed
State B	1,500	1,500/5,000 = 0.30 or 30%	(0.30)(2,000) = 600 tons
State C	1,500	1,500/5,000 = 0.30 or 30%	(0.30)(2,000) = 600 tons
State D	1,000	1,000/5,000 = 0.20 or 20%	(0.20)(2,000) = 400 tons
State E	1,000	1,000/5,000 = 0.20 or 20%	(0.20)(2,000) = 400 tons
Total Net Demand From Shortfall States	5,000		

For the incineration shortfall, State C would have to address 80 percent of the national shortfall amount and State D would have to address the remaining national shortfall amount, or 20 percent. With a net shortfall of 600 tons, State C would have to address 480 tons and State D would have to address 120 tons. For the landfill shortfall, State B and C would each have to address 30 percent of the national shortfall; and State D and State E would each have to address 20 percent. With a net shortfall of 2,000 tons, State B and C each would have to address 600 tons while State D and State E would be responsible for 400 tons each.

4.2 WASTE MINIMIZATION

Introduction

When states address CAP Management Categories with projected shortfalls in Phase 2, any state submitting a waste minimization projection greater than 10 percent should provide EPA with waste minimization analyses to support its estimate. Waste minimization analyses may also be conducted by states to address their individual shortfalls in Phase 3 CAP submittals. For Phase 3, as in Phase 2, states submitting projections of 10 percent or less do not need to submit accompanying documentation with their estimates. For their Phase 1 submittals, states should provide a narrative description of current and planned waste minimization programs, but should not incorporate the effects of these programs into their projections. This description should include information on any legislative authority that exists for current or potential waste minimization efforts and a summary of the program. If information in these areas has not changed since submission of its 1989 or 1992 CAP, a state can simply refer back to the appropriate CAP. For both Phases 2 and 3, states may choose to implement one or a combination of the approaches to project the effects of waste minimization on waste management capacity described below. State submissions in both Phases 2 and 3 will be evaluated by the criteria described later in this section.

As a matter of EPA policy and federal statutory mandate,[1] EPA encourages waste minimization as a key step toward a sound and balanced waste management program. The Pollution Prevention Act of 1990 reconfirmed EPA policy first established in the Hazardous and Solid Waste Amendments of 1984 regarding an environmental protection hierarchy that states:

> "[P]ollution should be prevented or reduced at the source whenever feasible; pollution that can not be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."[2]

For purposes of assuring adequate waste management capacity under Section 104(c)(9) of CERCLA, states are not required to project the effects of waste minimization programs, unless national shortfalls are identified in Phase 1. Based on the statutory language and corresponding EPA policy described above, EPA encourages states to target waste minimization efforts as their primary way to address capacity shortfalls. Successful

---

[1] Pollution Prevention Act of 1990, 42 U.S.C. §§13101-13109; Solid Waste Disposal Act, 42 U.S.C. §§6901-6992k.

[2] 42 U.S.C. §1301(b).

waste minimization programs can result in reduced need for siting new capacity or joining an interstate agreement, the two other ways a state can address capacity shortfalls.

For purposes of this Guidance, EPA has defined waste minimization as,

> "The reduction, to the extent feasible, of hazardous waste that is generated or subsequently treated, stored, or disposed. It includes any source reduction or recycling activity undertaken by a generator that results in: (1) the reduction of total volume or quantity of hazardous waste, (2) the reduction of toxicity of hazardous waste, or (3) both, as long as the reduction is consistent with the goal of minimizing present and future threats to human health and the environment."[3]

For clarification, burning for energy recovery, while it is a form of recycling, is not considered waste minimization. Additionally, use of dilution to decrease the toxicity of hazardous waste is not considered an acceptable form of waste minimization.

If nationwide shortfalls are identified in the national aggregation of supply and demand in Phase 1, all states that do not have sufficient in-state capacity for the shortfall management category will be responsible for forecasting, for their state, the effects of waste minimization in 1999 on demand for management capacity. States may wish to analyze the effects of waste minimization for all types of waste generated by a wide range of industries, using an equally wide range of processes. However, EPA will focus its evaluation only for those wastes that contribute to national shortfalls in management capacity. Similarly, in Phase 3 EPA will examine a state's projected increased waste minimization efforts only for wastes contributing to a national shortfall category.

EPA is requesting that states project the effects of waste minimization on demand only between 1993 and 1999. States should not incorporate additional effects of waste minimization beyond 1999. As described in section 4.5, the 1993-1999 projection period is the timeframe in which EPA will be tracking milestones established in the Phase 2 and Phase 3 submittals. The amount of waste minimization projected for 1999 will be held constant and straightlined from 1999 to 2013.

The remainder of this section is organized into four subsections:

(1) Review Criteria for Waste Minimization;
(2) Approaches for Estimating Future Waste Minimization;
(3) Presenting Results of Waste Minimization Estimates; and
(4) Milestones.

---

[3] U.S. Environmental Protection Agency, *1991 Hazardous Waste Report Instructions and Forms*, EPA Form 8700-13A/B (5-80) (Revised 08-91). In order to be consistent with the data used for baseyear calculations, the definition of waste minimization has been taken from the *1991 Hazardous Waste Report Instructions and Forms* (Biennial Report). This definition could be changed in the future due to changing program needs or legislative mandates.

Review Criteria for Waste Minimization

Four criteria have been developed that, in aggregate, seek to ensure that EPA's need for accuracy and fairness in evaluating whether waste minimization projections are reasonable is balanced with the states' need for flexibility in applying analytical approaches to project future waste minimization accomplishments. By specifying evaluation criteria before states forecast the effects of waste minimization in their CAPs, EPA hopes to promote consistency in the quality and detail of state projections and, in turn, EPA's review. The four waste minimization review criteria are:

(1) Adequacy of State Waste Minimization Infrastructure;
(2) Targeting of Waste Reduction Activities;
(3) Generator Communication; and
(4) Feasibility.

Projections of the effect of waste minimization will be considered reasonable only if a state addresses all four criteria in a manner that is consistent with projected levels of waste minimization. While precise guidelines would be impractical, given the states' need for flexibility, the level of detail in response to each criterion should increase in detail as the level of projected waste minimization increases.

These criteria were chosen because they provide four perspectives on the reasonableness of waste minimization projections. While each criterion alone is an indicator of reasonableness, together the criteria are designed to work as an integrated system. Designing the criteria in this manner provides EPA a standard of fairness and accuracy in evaluating responses with each criterion carrying equal weight. Yet, it also allows states to demonstrate reasonableness within the context of broader economic, regulatory, or other forces at work within their states. EPA recognizes that states can and will emphasize response in one or more criteria that best demonstrates the reasonableness of their projections.

EPA expects that states will view the criteria in the following chronological order. In the first criterion, a state will address the overall adequacy of its program. Targeting analysis to specific industries, waste streams, and processes will narrow the scope of inquiry and focus state resources on a smaller subset of generators. For these generators, the last two criteria will work in concert -- demonstrating that targeted generators are participating in waste minimization activities and that forecasts are technologically feasible and economically attractive.

There are many ways to meet these criteria. EPA fully expects that states will customize their responses to each criterion based partly on the industry, waste stream, and process for which a waste minimization projection is made and partly on the method used to make the projection. Examples of how states might meet each criterion are provided in the following sections.

This Guidance asks states to stratify their responses to the criteria according to the amount of projected reduction. Waste minimization in the amount from 0 to 10 percent seems to occur at the generator level and all states will be given the 10 percent credit. The

first level to require EPA review, 11 to 20 percent, requires limited documentation. The second level, 21 percent to 50 percent, asks states to respond somewhat more fully. The third level, 51 percent and higher, asks states to document in greater detail, exactly how high levels of waste minimization will be attained.

The Pollution Prevention Act of 1990 and corresponding EPA policy encourage the implementation of waste minimization programs that will cause net decreases in releases to the environment, taking all media into account. In recognition of this goal, the Generator Communication criterion explicitly requests states to document that cross-media transfers will be eliminated, where possible, or otherwise avoided or minimized. With respect to the other criteria, EPA encourages states to take cross-media transfers into consideration.

Since the 1989 CAP submissions, 31 states have passed laws that target reductions in waste generation, toxics use, and/or releases of toxic substances, such as those listed in the Toxics Release Inventory. EPA has studied these state laws in order to determine whether they will affect preparation of waste minimization projections for the 1993 CAP. We have found that most of these 31 state programs provide new sources of data, such as facility-level plans, which may assist the states in projecting waste minimization. The usefulness of these new forms of data varies widely, however, and in some cases the new state programs add few, if any, data that could form the basis for waste minimization projections.

The new state programs allow the states to more easily address the criteria. For example, descriptions of these new programs address the Adequacy of State Waste Minimization Infrastructure criterion. This is not meant to imply that merely describing a state's activities will satisfy the criteria. Whether a state meets the criteria will depend on whether its waste minimization projections are judged to be reasonable.

Some of these 31 new state programs target reductions in the use or release of toxic substances without an explicit emphasis on hazardous waste reduction. Some states have questioned whether they will be able to address the waste minimization criteria if their state programs are not targeted to waste reduction per se. A focus on toxic substances rather than hazardous waste is not expected to limit a state's ability to address the criteria, because these programs are likely to result in some hazardous waste reduction. A description of a Toxics Use Reduction program, for example, is relevant to the Adequacy of State Waste Minimization Infrastructure criterion.

Adequacy of State Waste Minimization Infrastructure

One indicator of the likelihood of attaining estimated waste minimization projections is the components of a state's waste minimization program. In order for EPA to evaluate waste minimization projections with respect to this criterion, a state should address at least the following questions:

- What types of activities are included in the state's waste minimization program?
- How are resources and staff now allocated among these various activities?

- For those states that have statewide hazardous waste reduction goals in place:

    - What is the relationship between the CAP projections and the state's goals? If the goals are not the same, is there an explanation for the difference?

In addition to the above, where waste minimization projections exceed 20 percent, but are not more than 50 percent, states should address the following questions:

- What existing or planned systems does the state have to monitor progress toward meeting waste minimization projections for targeted waste streams, generators, or processes?

- For those states that have statewide hazardous waste reduction goals in place:

    - Will waste minimization progress be measured the same way for state and CAP purposes? If not, please explain.

    - Are state goals, in fact, being realized?

In addition to the above, where waste minimization projections exceed 50 percent, states should address the following question:

- Has the state demonstrated or does it have a mechanism in place to show that state waste minimization program elements address and respond to the needs of the generators whose wastes place a demand on the state's shortfall management categories?

Discussion and Examples of Responses to this Criterion

Where states project from 10 to 20 percent waste reduction in 1999, simple descriptions of waste minimization programs will be sufficient. States need not include information already presented in their Phase 1 submittals. Included, for example, might be a summary of the statutory authority under which the program operates, a description of each program element, budget and staffing history of the program, a review of the past success of each program element, and an explanation of why these activities are expected to result in the levels of waste minimization forecasted. Where appropriate, states should demonstrate that goals and accomplishments under their own waste management planning programs or Toxics Use Reduction (TUR) strategies are consistent with their CAP forecasts of waste minimization. Any inconsistencies should be explained.

EPA also recognizes, for example, that state waste minimization goals are written for all waste generated within a state's boundaries, not necessarily for individual waste streams. Under these circumstances, it may be necessary to explain how a state's broadly articulated goal applies to reduction projections at the waste stream level.

Where CAP-forecasted waste minimization levels exceed 20 percent by 1999, states should provide information on the methods they have or plan to put in place to measure progress. Where facility-level waste reduction plans are available, for instance, states should document the process by which they monitor key facilities' achievements of waste reduction. EPA recognizes that some states have relatively new waste minimization and TUR goals in place and may not have had time to evaluate progress in meeting these goals. When responding to the last question under the medium level, please note if this fact is applicable to your state.

Where waste reduction projections are higher than 50 percent, states should demonstrate that certain elements of their waste reduction programs are designed to implement waste reduction at facilities that generate waste streams for which national shortfalls have been identified (shortfall wastes). Where a national shortfall in incineration exists, for example, states could respond to this criterion by describing how their own program activities respond to the needs of key facilities that generate incinerable wastes. Examples could include on-site waste audits, capital assistance programs, informational events such as workshops, or the facilitation of waste exchanges.

Targeting of Waste Reduction Activities

It is important that a state's waste minimization program be based on a full understanding of its hazardous waste management system. With this knowledge, a state is able to target its waste minimization efforts to address capacity shortfalls. In order for EPA to evaluate waste minimization projections with respect to this criterion, a state should address at least the first question below:

- Has the state demonstrated or does it have a mechanism in place to show that existing sources of data are used to target elements of its waste minimization program to (1) waste streams that place a demand on shortfall management categories, (2) generators that are expected to be generating those waste streams, and (3) processes used at targeted facilities?

In addition to the above, where waste minimization projections exceed 20 percent, but are not more than 50 percent, states should address the following question:

- Has the state demonstrated or does it have a mechanism in place to show how its communications strategy, including outreach materials, is or will be targeted to waste streams, generators, and processes that place a demand on shortfall management categories?

In addition to the above, where waste minimization projections exceed 50 percent, states should address the following questions:

- Has the state demonstrated that the following direct assistance or other efforts, in addition to a communications strategy, are targeted to waste streams, generators, and processes that place a demand on shortfall management categories? Consider the following elements:

- On-site technical assistance (e.g., waste reduction audits);
- Workshops and/or conferences;
- Publications, grants/tax incentives, general technical assistance;
- Economic incentives to overcome barriers to waste reduction;
- Regulatory efforts; or
- Others (please specify).

Discussion and Examples of Responses to this Criterion

EPA is aware that at least one state has used 1989 CAP data as a basis for targeting capacity shortfalls through waste minimization. One particular state has targeted incinerable wastes and, for the period from 1987 to 1992, expects to have a 40 percent reduction. Data from EPA's 1986 Generator Survey indicate that, on a national basis, roughly 800 (of a total of 16,000) facilities generate 95 percent of the hazardous waste shipped off site. Based on this information, EPA believes that most states will be able to target activities to a relatively small number of generators. Some states, however, may prefer to work through relevant trade associations.

States can use Biennial Report data and FOCUS software (or other database software that can read Biennial Report data) to target generators that send wastes to a specific CAP Management Category. For example, if a specific CAP Management Category or a set of CAP Management Categories is identified for targeting, it is possible to sort Biennial Report data to determine generators and the quantities of waste going to these categories by:

- **EPA hazardous waste code**;
- **Standard Industrial Classification (SIC) Code** for the waste stream (e.g., printed circuit board manufacturing or primary aluminum manufacturing);
- **Form Code** (e.g., aqueous waste with low solvents, spent carbon, organic paint, or ink sludge);
- **Source Code** for the process associated with generation of the waste (e.g., vapor degreasing, electroplating, or plastic forming); and
- **EPA ID Number** of the generating facility.

Once states identify the generators of shortfall wastes, they can target waste minimization activities to processes by contacting generators directly to identify such processes and/or by using information on RCRA Part B permits, National Pollutant Discharge Elimination System (NPDES) permits, air permits, pre-manufacturing notices under the Toxic Substances Control Act, or consent decrees.

Generator Communication

Estimated future levels of waste reduction will be more credible if generators participate in the process of projecting them. EPA recognizes that the level of interaction with

generators will vary from state to state. Higher levels of waste reduction should be accompanied by stronger generator commitment. States should document which, if any, levels of communication have been established with generators by answering at least the following question:

- Have generators been notified of state waste reduction projections?

In addition to the above, where waste minimization projections exceed 20 percent, but are not more than 50 percent, states should address the following question:

- Do generators whose wastes place a demand on shortfall management categories agree with state waste reduction projections?

In addition to the above, where waste minimization projections exceed 50 percent, states should address the following questions:

- Are the state's future waste reduction projections based on estimates provided by those facilities that are principal generators of shortfall wastes?

- Has the state provided documentation from the targeted generators indicating that the proposed waste minimization activities are consistent with EPA policy that cross-media transfers will be eliminated where possible, or otherwise avoided or minimized?

Projections of future waste minimization will be more credible when accompanied by documentation showing that generators' commitments to specific waste reduction targets are consistent with projections made by states in their CAPs.

Discussion and Examples of Responses to this Criterion

States that choose to base their waste minimization forecasts on survey data solicited from generators within their state meet this criterion, almost by definition. In such cases, states should include in their CAP, a copy of the survey instrument used, several example responses, and a summary table of all responses organized, perhaps by industry, type of waste, and process.

States that do not conduct a full-scale survey of industry can still address this criterion in a variety of ways. Regardless of the approaches used to project future waste minimization, states may wish to have industry formally review and comment on state projections of both timing and amount of reduction by industry and type of waste. Small focus groups of targeted industrial representatives, for example, can be organized at relatively low cost to review the forecasting approach used by the states and its results. Trade associations also may be helpful in reviewing or generating forecasts. A brief report documenting the comments of such a group responds to the first level of generator commitment. At higher levels of projected reductions, states should document the extent to which relevant industries agreed with state projections or provided the numbers themselves.

Feasibility

One of the indicators of whether waste minimization projections are realistic is whether they are technologically and economically attainable or attractive. This criterion addresses whether the state, or the targeted generators via the state, have adequately explained the techniques that, if applied, would result in waste reduction levels projected in the CAP. In effect, this information would provide a basis to be used as a check against waste reduction estimates. It is intended to be applied to targeted facilities at a minimum. Therefore, states should address at least the following question for those CAP Management Categories in which there are national shortfalls:

- Has the state documented the techniques by which waste reduction levels could be achieved (technologies, housekeeping, inventory control measures, worker training, etc.)?

Where waste minimization projections exceed 20 percent, but are not more than 50 percent, states should address the following question, in addition to the above:

- Has the state demonstrated an awareness of any economic, legal, or institutional barriers that would prevent implementation of the techniques in question?

Where waste minimization projections exceed 50 percent, states should further address the following questions:

- Has the state documented that certain facilities have already adopted the techniques in question?

- Has the state discussed adoption with key facility decision makers to confirm that implementation is planned?

- Has the state implemented, or does it plan to implement, programs to overcome barriers to implementation of the techniques in question?

Discussion and Examples of Responses to this Criterion

Abstracting case studies of successful waste reduction from the engineering literature is perhaps the most rudimentary way to demonstrate that technology exists and has been found to be economically achievable in the field. Some states will probably choose to make such a demonstration.

Alternatively, where states establish a high level of generator communication (e.g., conducting surveys or focus groups), it should be relatively straightforward for industry to provide documentation on the techniques they plan to use to attain forecasted levels of waste minimization.

As forecasted levels of waste reduction increase, this criterion may be satisfied with a demonstration of an understanding of the potential impediments to waste reduction. Where they exist and are inconsistent with forecasted levels of reduction, states should further

demonstrate how they plan to overcome these barriers. Such information will be most credible if it is developed for key, targeted generators. For example, states can examine generators' facility-specific economic analyses to determine the extent to which economic factors may be a barrier to waste reduction.

Approaches for Estimating Future Waste Minimization

States are free to use any method they choose to project the effects of waste minimization on waste management capacity. Based on previous CAPs and analytical approaches states currently use in their own waste minimization programs, three approaches are common:

- Surveying industry about their future plans for waste reduction;
- Applying extracts from the engineering literature that document past waste minimization accomplishments; and
- Conducting statistical and other analyses of trends in waste generation data.

In its review of these three approaches used in the 1989 CAPs, EPA has determined that no single projection approach may be adequate to prepare reasonable projections and to meet all four criteria. Please see Exhibit 4-3. It may be in a state's best interest to combine two or more types of analyses, depending on the level of waste minimization projected. The results of one approach can be used to check another. The remainder of this section and the details found in Appendix G describe why a state might choose to combine projection approaches.

Because some of the approaches described in this Guidance can require a significant analytical effort and because often they offer economies of scale in analysis, groups of states may find it attractive to collectively support a more substantial waste minimization analysis than any single state might undertake on its own. For instance, EPA knows of at least one instance where states in the Western Governors' Association (WGA) benefitted from economies of scale by participating in collective CAP analysis.

Generator Surveys

A survey is a systematic way to collect information about the characteristics of an entire population by contacting and interviewing its members or a sample of all members of that population. In this case, surveys would be used to gather information on the potential to reduce generation of hazardous waste at the facility and process levels. Information is collected using a survey instrument or questionnaire that includes explicit instructions and a script or protocol of individual questions. Questions may be either open-ended (i.e., allowing flexibility in responses) or closed-ended (i.e., drawing responses from among an exhaustive, but finite group of choices). EPA has sample survey forms available upon request to any state.

Exhibit 4-3
Relationship Between Approaches to Forecasting Future Waste Minimization and EPA's Evaluation Criteria

Approaches	Evaluation Criteria			
	Adequacy of State Waste Minimization Infrastructure	**Targeting of Waste Reduction Activities**	**Generator Communication**	**Feasibility**
Generator Surveys	May not provide any information about the adequacy of a program	Collect information from a targeted population of generators	Useful for demonstrating communication with generators	Provide a good vehicle for gathering information on the feasibility of waste reduction
Engineering Literature Reviews	Provide no information about the adequacy of a program	May provide limited information to target waste reduction opportunities	Do not provide a means of communicating with generators, but may make such communication more informed	Can provide adequate information on the feasibility of waste reduction
Historical Data Analysis	May not provide any information about the adequacy of a program	Can provide information to target waste reduction activities	May require follow-up communication with generators	Can provide insights on the potential for achieving waste reduction; some types of data analysis allow for measurement only of past successes

Generator surveys provide useful information for projection purposes because they document, to the best of industry's ability, what generators themselves predict they can accomplish in reducing waste generation. However, surveys can be expensive to implement, especially for a large number of generators. Furthermore, critical to the usefulness of generator survey results is a well-designed survey instrument, a statistically sound sampling plan (or a census of key industries), and corroborating questions that provide a check on generators' understanding of questions and presentation of answers.

Engineering Literature Reviews

A review of the engineering literature provides information on technological and economic opportunities for certain industries to reduce certain types of wastes. This review can be used to help verify the validity of waste reduction forecasts made for a particular industry and waste stream. The estimates of waste minimization potential can serve as an "upper bound" to evaluate whether a projected reduction is technologically and economically feasible.

While a review of the engineering literature can provide a sense of what can be achieved, it cannot provide the full range of information necessary to project waste reduction. For instance, the review does not give any indication of whether and to what extent industry has already adopted any of the documented mechanisms for reducing waste. Information from the engineering literature may be best used to improve the understanding of facility-specific information as it is gathered from other sources.

Historical Data Analysis

Analysis of past and current waste generation characteristics of generators may be useful to help assess the future potential for individual generators (or industries as a whole) to reduce waste. There are limitations with analyzing historical data, however. Without field validation, it could be difficult to accurately project future waste minimization based on past information. For example, a generator may have utilized all of the housekeeping and inventory control techniques available to him to reduce hazardous waste generation at his facility. These initiatives may have resulted in a 15 percent reduction in a given year, but are not able to yield further waste reductions in the future. Additionally, generators' abilities to achieve further reductions could be affected by the availability of future funds and company commitment to future waste reductions.

Nonetheless, analysis of historical data may prove to be a useful tool in the development of future waste minimization estimates. There are many types of data analyses for waste generation that principally fall under two categories: (1) comparison of waste generating characteristics of similar facilities across industries (cross-sectional analysis), and (2) calculations of trends in waste reduction accomplishments at a single facility over the period for which data are available (time-series analysis).

The first type of analysis has two components: (1) a statistical comparison of the relative production efficiencies of apparently similar facilities producing similar products and similar waste streams, but different rates of waste generation per unit of output, and (2) field validation of the inferences drawn from the statistical comparison. An alternative approach to the first step in this type of analysis would be a statistical comparison of production

efficiencies of apparently similar facilities to an idealized plant (with regard to waste generation). Its usefulness as a tool to project future potential to reduce waste generation is based on the assumption that some firms have already implemented waste minimization efforts and others have not. Differences in waste generation characteristics between firms in the same industry give some indication of unrealized opportunities for waste reduction.

The first step in analyzing differences among facilities is collecting the necessary raw data on how much waste was produced by each firm in a baseyear, broken down by the type of waste and industry. Sources of such data include the Biennial Report, state annual generator surveys, manifest data, or other surveys. States will also need facility-level output data, which typically should be available from state sources of industrial economic information, such as economic development commissions, bureaus of labor or economic statistics, or state business councils.

In the second type of analysis, waste reduction potentials are evaluated using two or more years of data for a particular facility. Essentially, waste reduction between the previous year and the current year is calculated as the difference between what would have been generated strictly on the basis of changes in production levels (assuming no changes in process technology), and what was actually generated. However, not all facilities report this type of information on forms GM and IC of the Biennial Report.

Regardless of the approach, however, analysis of waste generation characteristics using historical data can reveal insights about waste reduction potential. Analysis of historical data, combined with field validation, may be the most feasible approach to estimate waste reduction potential for a large number of facilities within a wide variety of industries. Results of such analysis may be useful in conjunction with other projection techniques.

Exhibit 4-3 summarizes the relationship between approaches to forecasting future waste minimization and EPA's evaluation criteria. In some cases, simply by choosing to pursue one or more of these forecasting approaches and documenting how estimates were made, states will already have much of the material to demonstrate that the criteria were met (see the later section on "Presenting Results of Waste Minimization Forecasts"). In other cases -- particularly with respect to the adequacy criterion -- states may have to prepare text and related exhibits that go beyond the results of waste minimization forecasts.

Presenting Results of Waste Minimization Estimates

As mentioned above, waste minimization calculations will probably be conducted at the waste stream, facility, and industry levels. For CAP purposes, results of such analyses should be expressed in terms of their impacts on demand for waste CAP Management Categories. In Phases 2 and 3, a state is only responsible for providing waste minimization information for CAP Management Categories to which it has been identified by EPA as having to address. In both Phases 2 and 3, states should present the results of their waste minimization forecasts as depicted in Exhibit 4-4.

Thus, three documentation items should be included with both Phase 2 and 3 waste minimization submissions: (1) documentation of the approaches used to forecast future waste minimization for each CAP Management Category where there is an identified shortfall

(a description of this documentation appears below); (2) responses to the four evaluation criteria described above in this section; and (3) a completed Exhibit 4-4.

States should document the approaches they use to forecast future waste minimization for each CAP Management Category where there is an identified shortfall. Documentation should include a general description of the approach, sources of data, assumptions, sample calculations, and presentation of results at the level used to conduct the analysis.

Where a state chooses to conduct a survey of generators, for example, documentation should include the following:

- A copy of the survey form;
- A description of the sampling plan (if applicable) and why that plan was chosen;
- A sample survey response;
- A description of the calculations used to aggregate survey responses and represent results in terms of future waste reduction and their impacts on demand for waste CAP Management Categories; and
- A list of the individual(s) responsible for conducting the survey and analyzing survey responses.

A similar level of detail should accompany any form of data analysis. States should document the theory underlying the type of analysis performed; identify sources of data; summarize how calculations were made; and present results in a form that is consistent with the level of waste reduction forecasted. Regardless of the approach taken, waste minimization results should be expressed in tons of reduced demand for each applicable CAP Management Category as organized in Exhibit 4-4.

Exhibit 4-4
Estimated Reduction in 1999 Demand for Commercial Hazardous Waste Management Capacity Due to Waste Minimization (tons)

(This table is to be used only in Phases 2 and 3.)

CAP Management Category	Reduction in 1999 Demand for Commercial Subtitle C Management Capacity
RECOVERY	
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
TREATMENT	
Stabilization/Chemical Fixation	
Incineration - Liquids and Gases	
Incineration - Sludges/Solids	
Fuel Blending	
Hazardous Wastewaters and Sludges Treatment	
DISPOSAL	
Landfill	
Deepwell/Underground Injection	

Milestones

EPA plans to track the progress of reduction estimates made in the 1993 CAP through the evaluation of annual milestones. States should specify milestones that EPA can use to evaluate a state's effort toward implementing the strategy presented in the CAP for achieving projected reduction in waste generation. Examples of such milestones include:

- Expansion of staff or budget to levels projected in the 1993 CAP;
- Addition of targeted programs;
- Evidence of meaningful communication with generators;
- Documentation that program efforts were conducted; or
- Evidence of progress based on analysis of information reported on Forms IC and GM of the Biennial Report (see Appendix G for a more detailed discussion).

4.3 DEVELOPMENT OF NEW HAZARDOUS WASTE CAPACITY

If shortfalls are identified in the national aggregation of supply and demand, EPA will require those states that have demand greater than supply for the shortfall CAP Management Categories to prepare Phase 2 submissions that include waste minimization plans and identify capacity that is permitted, but not operational, or that has been issued a draft permit. If shortfalls remain at the end of Phase 2, EPA suggests that states identified as having to address the shortfall in Phase 3 attempt to assure capacity first through increased waste minimization efforts. If, however, it is not possible to assure capacity through only waste minimization, some states that contribute to national shortfalls may wish to site new treatment and disposal facilities or expand existing facilities. In particular, those states that should address a large portion of the national shortfall may choose this method. If a state chooses this method of assurance, the state should, in its Phase 3 CAP submittal, document its capacity development process and plans and establish specific milestones for creating new capacity. Milestones should also be submitted for the development of capacity that has draft permits issued but is not yet operational.

States that plan to develop new capacity to alleviate shortfalls should describe their procedures for facility siting, permitting, and expansion. These states should commit to EPA that they will develop specific quantities and types of additional capacity through either new or expanded facilities in the state. This description should include dates for interim and final capacity development, such as site designation, permit application submittal, draft or final permit approval, construction start, and facility operation. These states should analyze and discuss the selected aspects of their regulations, policies, and procedures, as well as economic and other considerations that may assist or may prevent or impede achievement of these milestones. These states also should discuss how they will overcome any impediments to achieving these milestones. If information of this nature was presented in previous CAP submittals, and it has not changed, the state may refer to the CAP submittal and not resubmit the same information.

A state or a group of states in an interstate agreement may be in a position in which siting a management facility should be pursued in order to make an assurance of adequate capacity. If so, states should develop a schedule of capacity development milestones to cover capacity shortfalls. These milestones should reflect key dates for decisions and activities that lead to the permitting of Subtitle C hazardous waste management capacity that addresses the state's capacity shortfalls by December 30, 1999. It is not necessary to list specific facilities by name or location; it is necessary only to describe the total capacity to be created (or expanded) by a given date that will result in permitting of the new capacity by the end of 1999. Examples of major milestones for the creation of new capacity include:

- Public hearings;
- Public outreach and education;
- Designation of candidate sites;
- Selection of a site;

- Permit application submittal;
- Permit application revision, if necessary;
- Draft permit approval; and
- Final permit approval.

At least one major milestone per year, which covers one or more types of capacity shortfalls, should be included. States are not restricted to the above milestones, but are encouraged to achieve a substantial degree of specificity in defining milestones in order to provide credible plans. States should clearly define the quantitative milestones that will assure the availability of adequate capacity.

Some states have expressed concern that the designation of milestones may prejudice the siting designation process. EPA is providing states with the flexibility to revise milestones to reflect new schedules, as long as reasonable justification is provided before the milestone date. This concept of maintenance is the responsibility of the state. EPA will consider any missed milestones that have not been revised as grounds for withdrawing the availability of future funding for Superfund remedial actions.

4.4 CAPACITY ASSURANCE USING "INTERSTATE AGREEMENTS OR REGIONAL AGREEMENTS OR AUTHORITIES"

CERCLA §104(c)(9) requires that assurances relying upon the availability of facilities outside the state be in accordance with an "interstate agreement or regional agreement or authority." EPA believes that interstate agreements demonstrate that states are working cooperatively to create or otherwise assure adequate capacity. The legislative history of Section 104(c)(9) indicates that Congress anticipated that "interstate agreement" can be interpreted to mean several different types of agreements. In particular, EPA has interpreted "interstate agreement" to include agreements among states, agreements among states and facilities in different states, or agreements among generators and facilities in different states.

Various types of interstate agreements may be appropriate for different phases of the capacity analysis. The following types of interstate agreements may apply to different phases of the CAP process:

- Agreements between generators and hazardous waste commercial treatment and disposal facilities (TSDFs) to manage wastes;
- Agreements between states to collectively participate in waste minimization planning;
- Agreements between states and commercial hazardous waste TSDFs to manage wastes; and
- Agreements between states to collectively develop new capacity.

The first type of agreement, which would exist in the form of contracts between generators and TSDFs, will be used to allocate existing capacity in all stages of the CAP. For instance, when adequate national capacity exists to manage wastes for twenty years, EPA believes that contracts between TSDFs and generators would suffice to assure capacity nationwide. These contracts can be interpreted as interstate agreements because the legislative history of CERCLA §104(c)(9) contemplates that interstate agreements include agreements between private facilities in different states.

If EPA determines that a shortfall exists for a management category, agreements that allocate existing capacity will not adequately address all future waste generation. Therefore in Phase 2 and 3, states should consider agreements that address projected capacity shortfalls. The latter types of agreements, listed above and discussed below, may be used by states to address the future capacity needs. These agreements would not be used to allocate existing capacity in Phase 1; however, since Phase 1 is limited to projections of capacity, assuming no special new efforts by states to develop capacity.

In the second type of agreement, states could address shortfalls in Phases 2 and 3 through interstate agreements in which states agree to participate in collective waste minimization planning. Collective plans may include pooling resources for an interstate generator survey, for example, upon which various states could base waste minimization forecasts. These agreements should include milestones to meet waste minimization projections and appropriate waste minimization documentation as described in section 4.2. Under Phase 3, states also have the option to enter into interstate agreements with states who agree to increase waste minimization efforts beyond plans submitted in Phase 2.

The third example of an interstate agreement would be between a state and a private TSDF to develop future capacity. CERCLA 104(c)(9) legislative history and a subsequent judicial court opinion[4] support the idea that a state can contract with a private TSDF inside or outside of the particular state in order to assure capacity for its hazardous waste generation. This type of agreement could be used in Phase 3 by a state that has been identified as a shortfall state in order to assure the availability of new capacity.

The fourth example of an interstate agreement would document an agreement between states to collectively develop new capacity. If EPA identifies that the national shortfall(s) still remain and should be addressed in Phase 3, states contributing to the national shortfall may decide to collectively develop new capacity to address shortfalls by signing bilateral or multilateral documents concerning new capacity development.

When an agreement involves more than one state, the text of the interstate agreement should specify whether each state is responsible for achieving individual milestones, or if the states are collectively responsible for achieving milestones. This clarification will be important if milestones are not met and EPA determines that sanctioning (i.e., denying new remedial funding) is appropriate. If the interstate agreement specifies that states are responsible for achieving individual milestones, EPA will sanction only those states in the interstate agreement that have failed to meet their milestones. In this case, the interstate agreement should provide EPA with individual milestones so that EPA can justify sanction determinations. In cases where the interstate agreement specifies that the states have agreed to be responsible for meeting the milestones collectively as an entity, EPA will deny new remedial funding to all states if milestones are missed and it has been determined that sanctioning is appropriate. States may also choose to have a combination of individual and collective milestones; the Agency has no objections to such agreements, provided the submittals specify which states are responsible for achieving which milestones.

States should also specify anticipated barriers to achieving collective goals as well as methods to recognize and overcome the barriers. The interstate agreements in any phase will be considered legal and binding contracts. Generally, interstate agreements that address shortfalls should contain enough information to represent a solid commitment. The following are suggested provisions of such interstate agreements:

- The states involved in the agreement;
- Overall objective of the agreement;

---

[4] *National Solid Waste Management Association v. Alabama Department of Environmental Management*, 910 F. 2d 713 (11th Cir. 1990), modified, 924 F. 2d 1001, cert. denied 111 S. Ct. 2800 (1991).

- Responsibilities of participating states;
- Duration of the agreement;
- Implementation of sanctions by EPA on:
  - Individual state basis, and
  - Collective group basis;
- Specific milestones and goals to be achieved such as:
  - Percentage collective waste reduction within X years,
  - Facility siting within X years, and
  - New regulations or state programs within X years;
- Detailed plans to achieve stated goals, including provisions addressing economic and political considerations; and
- Signatures of all parties involved in the agreement.

4.5 MILESTONES

States identified as having to address projected capacity shortfalls should include milestones for each shortfall CAP Management Category in their Phase 2 and 3 CAP submittals designed to resolve those shortfalls. Milestones are necessary so that the Agency can evaluate states' progress toward addressing shortfalls in CAP management categories so that their CAP approval can be maintained.

A state plan to develop or enhance waste minimization targeted at generators in shortfall management categories for Phase 2 should have milestones for actions needed to achieve the program objectives. Also, in Phase 2 states should submit milestones for capacity with draft permits issued by the state. If a shortfall state, in its Phase 3 submission, is planning development of new waste management capacity or increasing waste minimization efforts over those identified in Phase 2, the state plan should include milestones for developing that capacity or increasing waste minimization. Milestones will be part of the state's demonstration of its commitment to the capacity assurance plan, and will be used by EPA to monitor implementation of the plan.

Since states will project capacity from 1993 to 1999, this projection period will provide a window for tracking milestones established in Phase 2 and Phase 3 submittals. Specifically, for the 1993 CAPs, milestones will be tracked by the Agency through the end of 1999. Some time before 1999, the Agency will ask states to provide new CAP updates that will contain milestones for another six-year timeframe. Outstanding milestones from the 1995-1999 period should be carried over in these updates.

If a state fails to meet the milestones agreed to in its plan, EPA will re-examine whether the state's assurance as a whole is still adequate. If EPA deems the plan to be inadequate to assure capacity, EPA will halt funding of new remedial actions in the state. EPA is not requiring a state to demonstrate compliance with all milestones in order to show that reasonable progress is being made to address its capacity shortfalls. Rather, EPA will consider a state to be making progress toward alleviating its capacity shortfalls if it meets at least one milestone per year. The requirement that states meet at least one milestone per year does not relieve states of their responsibility to make progress on their other milestones; EPA expects states to submit annual reports to EPA that describe their progress toward meeting all of their milestones. Progress reports should be brief and emphasize the state's efforts toward meeting milestones. Furthermore, before cooperative agreements for remedial funds are signed, EPA also plans to evaluate milestones to ensure that the state CAP is current and no milestones are delinquent.

As indicated earlier, EPA is providing states with the flexibility to revise milestones to reflect new schedules so as to not prejudice the siting and permitting process. If a state believes that it will miss a milestone, it should submit to EPA written documentation of its attempts to meet the milestone, justification explaining why the state is going to miss the milestone, and a revised schedule for achieving this and any remaining milestones. This

information should be submitted before the milestone is missed, or the Agency may consider the CAP to be inadequate for assurance pursuant to CERCLA §104(c)(9). EPA will review the justification along with the revised schedule and will agree to the new schedule provided the explanation is reasonable and the state has made a good-faith effort to meet its milestones.

The procedure outlined above is not limited to individual states. States that pool both resources and shortfalls may opt to meet the above milestone reporting requirements collectively through an interstate agreement. The group of states should meet at least one milestone per year to show that progress is being made toward addressing the shortfall. This would be in lieu of each state in the agreement being required to meet an individual milestone per year. It should be understood, however, that states that choose this option also share a collective burden to assure that at least one milestone per year is achieved. If at least one milestone is not met per year, each state in the interstate agreement will be held accountable. States acting together in an interstate agreement are also expected to submit the annual report to EPA, as described above, which tracks the agreement's progress towards meeting all of its milestones. States collectively addressing shortfalls are encouraged to meet regularly to discuss waste minimization and capacity development activities. These meetings can also be documented in the annual report to EPA to show progress towards addressing shortfalls.

GLOSSARY

GLOSSARY

Available Capacity	The quantity of hazardous waste management capacity that was not used during a given year (i.e., maximum capacity minus utilized capacity).
Baseline	The set of data used as a starting point for projecting future hazardous waste generation and management. The baseline is created by adjusting the baseyear data as described in Chapter 3.
Baseyear	The year for which hazardous waste generation and management data are used to establish a baseline for projecting future hazardous waste generation and management. The year 1991 will be the baseyear for 1993 CAPs.
Biennial Report	A report that hazardous waste generators and treatment, storage, and disposal facilities are required to complete every two years. The types of information requested in the Biennial Report on hazardous waste include the quantity, nature, disposition, and the efforts taken to reduce the volume and toxicity of hazardous waste.
CAP Management Category	A set of hazardous waste management processes that can be used to manage a particular hazardous waste without loss of treatment efficiency. The CAP Management Categories are based on the codes used in the 1991 Biennial Report for describing specific types of hazardous waste management systems. The four broad groupings for the CAP Management Categories are (1) recovery, (2) treatment, (3) disposal, and (4) transfer/storage. See Chapter 2 for a complete discussion of the CAP Management Categories.
Capital Assistance Program	A program that provides assistance for either the acquisition of capital or the reduction of capital costs through the use of mechanisms such as loan guarantees, credit enhancements, and tax incentives.
Captive System	A system that has treatment, disposal, or recycling (TDR) capacity available for hazardous waste received only from generators under the same company ownership, but at a different location.
Captive Facility	A facility that manages waste only from off-site generators owned by the same company, and possibly waste generated on site.

Commercial Status The accessibility of a hazardous waste management system to waste generators. The three types of hazardous waste management systems are:

- **On-site** Access is limited to waste generated on site.
- **Captive** Access is limited to waste from generators under the same company ownership.
- **Commercial** Accessible to all waste generators.

Commercial System A system that has treatment, disposal, or recycling (TDR) capacity available to any hazardous waste generator. Also included in this definition is limited commercial TDR capacity, which is available to a limited number of generators.

Commercial Facility A facility that manages waste from any generator, including off-site generators not under the same company ownership. A commercial facility may have captive and on-site systems in addition to the commercial system(s). This definition includes limited commercial facilities, which manage waste generated off-site by a limited number of facilities.

Commercial RCRA Subtitle C Management Capacity The capacity of a commercial system available to manage RCRA Subtitle C hazardous waste. The 1993 CAP projections focus on the demand for and supply of this capacity.

Conditionally-exempt Small Quantity Generator (CESQG) A CESQG meets the following criteria every month:

(a) in every single month during 1991, the site generated no more than 100 kg (220 lbs) of RCRA Subtitle C hazardous waste, and no more than 1 kg (2.2 lbs) of RCRA Subtitle C acute hazardous waste, and no more than 100 kg (220 lbs) of material from the cleanup of a spillage of RCRA Subtitle C acute hazardous waste; and

(b) at any time during 1991, the site accumulated no more than 1,000 kg (2,200 lbs) of RCRA Subtitle C hazardous waste, and no more than 1 kg (2.2 lbs) of RCRA Subtitle C acute hazardous waste, and no more than 100 kg (220 lbs) of material from the cleanup of a spillage of RCRA Subtitle C acute hazardous waste; and

(c) the site treated or disposed of the RCRA Subtitle C hazardous waste in a manner consistent with regulatory provisions.

Demand The quantity of primary and secondary waste managed in treatment, disposal, and recycling facilities in a given year.

Economic Incentives — Approaches based on economic or market forces that result in some desired behavior; generally some reward for the desired behavior or some penalty for undesirable behavior.

Equivalent Data — State data derived from official surveys or manifests that report information similar to that collected in the 1991 Biennial Report.

Exports — Hazardous waste transported out of a state to another state or country.

Facility Expansion — An increase in the hazardous waste management capacity of an existing hazardous waste management facility. Facility expansions include the construction of plant additions and the substitution of new equipment for older equipment with a resultant ability to handle greater volumes of waste.

Generation — The quantity of waste generated in a given year that is managed at a treatment, disposal, or recycling facility.

Generator Status — The classification of a hazardous waste generator, as determined by the quantity of RCRA Subtitle C hazardous waste generated in the reporting year. The four possible generator types listed in the 1991 Biennial Report are large quantity generator (LQG), small quantity generator (SQG), conditionally-exempt small quantity generator (CESQG), and non-generator.

Imports — Hazardous waste transported into a state from another state or country.

Inventory Control Measures — Reducing product storage in inventory to minimally acceptable needs for near-term demand; substituting production for inventory where possible to reduce potential for disposal of expired or outdated product in inventory.

Large Quantity Generator (LQG) — A site is a LQG if it met any of the following criteria:

(a) in one or more months during 1991 the site generated 1,000 kg (2,200 lbs) or more of RCRA Subtitle C hazardous waste; or

(b) in one or more months during 1991, the site generated or accumulated at any time, 1 kg (2.2 lbs) of RCRA Subtitle C acute hazardous waste; or

(c) at any time, the site generated or accumulated more than 100 kg (220 lbs) of spill cleanup material contaminated with RCRA Subtitle C acute hazardous waste.

Materials Recovery — Recovery of materials, such as metals, in waste streams, either in the original production process or in some other process.

Maximum Capacity The definition of the maximum capacity of a hazardous waste treatment, disposal, or recycling unit depends on whether the unit is a landfill or a flow system (i.e., not a landfill):

- **Landfill** The quantity of hazardous and non-hazardous waste that could enter the landfill over its remaining lifetime, excluding quantities of non-waste materials used for daily and final cover and assuming that future waste is the same type as the waste disposed in the baseyear (i.e., 1991).
- **Flow System** The greatest quantity that could have entered the system in one year assuming (1) no change in equipment; (2) an unlimited supply of waste similar to that managed in the baseyear; (3) willingness to add possible additional shifts; (4) routine downtime; (5) no impact from other systems that share the same unit; and (6) permit and regulatory limits are not exceeded.

Milestone A task or achievement necessary to assure adequate capacity that is scheduled to be accomplished by a specific time. (See Chapter 4 for a complete discussion of milestones.)

Mixed Radioactive/ Hazardous Waste Source material, special nuclear material, or by-product materials, as defined by the Atomic Energy Act of 1954, as amended, that are mixed with hazardous waste. By themselves, radioactive wastes are not classified as hazardous waste under RCRA. If they are mixed with RCRA hazardous waste, however, the material is controlled under RCRA regulation and under Atomic Energy Act regulations. EPA has jurisdiction over only the hazardous portion of mixed radioactive hazardous waste.

National Shortfall Amount The quantity by which the national demand for capacity in a CAP Management Category exceeds the supply of commercial capacity in that CAP Management Category for the projection year 2013.

Non-RCRA Subtitle C Hazardous Waste A waste that is not a RCRA Subtitle C hazardous waste. Non-RCRA Subtitle C-hazardous wastes include wastes that are considered hazardous within the state, but that are not hazardous under 40 CFR Part 261.

On-site System A system that is only used to treat, dispose, or recycle hazardous waste that is generated on-site.

On-site Technical Assistance Programs established to provide a range of technical advice, assistance, and consultation at the actual plant.

One-time Waste	Any contaminated materials or treatment residuals (e.g., soils, sludges, debris, and equipment) generated by any of the following remediation or cleanup activities: (1) Superfund remedial actions; (2) state remedial actions; (3) Superfund removal actions; (4) corrective actions at RCRA hazardous waste management units; (5) closures of RCRA hazardous waste management units; and (6) other remediation activities, including those resulting from state and private emergency removals, environmental audits, and property transfers.
Primary Waste	Hazardous waste generated directly from a production process or from the treatment of a non-hazardous waste.
Product or Input Substitution	Changes in raw materials, either to different materials (e.g., water instead of organic solvents) or materials with different specifications (e.g., lower levels of contaminants).
Production Efficiency	A measure of how efficiently industrial processes convert inputs into products, expressed as a ratio of input/product.
RCRA Subtitle C Hazardous Waste	Waste defined as hazardous under 40 CFR Part 261.
RCRA Subtitle C Hazardous Waste Stream	A RCRA Subtitle C hazardous waste that may have more than one EPA Hazardous Waste Code, but that originates from one or more of the following sources: (1) a production process or service activity; (2) equipment decommissioning; (3) a spill cleanup or other remediation activity; (4) the management of a non-hazardous waste; (5) an off-site generator (including waste received, but not treated or recycled, and shipped off-site); and (6) the on-site treatment, disposal, or recycling of previously existing hazardous waste stream(s) (i.e., residuals).
Recurrent Waste	Waste generated from continuous and intermittent (e.g., leak collection and oil changes) processes, such as industrial processes. Recurrent hazardous waste includes all hazardous waste other than that derived from non-recurrent activities (see one-time waste).
Secondary Waste	Hazardous waste generated from the management of primary waste.

Small Quantity Generator (SQG)

A SQG is defined by all the following criteria:

(a) in one or more months during 1991 the site generated more than 100 kg (220 lbs) of RCRA Subtitle C hazardous waste, but in no month did the site: (1) generate 1,000 kg (2,200 lbs) or more of RCRA Subtitle C hazardous waste, or (2) generate 1 kg (2.2 lbs) or more of RCRA Subtitle C acute hazardous waste, or (3) generate more than 100 kg (220 lbs) or more of material from the cleanup of a spillage of RCRA Subtitle C acute hazardous waste; and

(b) the site accumulated at any time during 1991 no more than 1 kg (2.2 lbs) of RCRA Subtitle C acute hazardous waste and no more than 100 kg (220 lbs) of material from the cleanup of a spillage of RCRA Subtitle C acute hazardous waste; and

(c) the site stored its RCRA Subtitle C hazardous wastes in tanks or containers in a manner consistent with regulatory provisions.

OR, the site is a Small Quantity Generator if, in 1991,

(a) the site met all other criteria for a Conditionally Exempt Small Quantity Generator (CESQG), but

(b) the site accumulated 1,000 kg (2,200 lbs) or more of RCRA Subtitle C hazardous waste.

Standard Industrial Classification (SIC) Code

A four-digit coding system, developed by the U.S. Census Bureau and U.S. Office of Management and Budget, that categorizes the principal product or group of products produced or distributed, or services rendered, at a site's physical location.

Storage Facility

A facility used to store hazardous waste for a temporary period, at the end of which the hazardous waste is treated, recycled, disposed of, or stored elsewhere.

Transfer Facility

Any transportation related facility including loading docks, parking areas, storage areas, and other similar areas where shipments of hazardous waste are held during the normal course of transportation.

Treatment Residuals

Hazardous waste generated from the management of primary or secondary waste.

Unit of Product

Units of production such as tons of steel, barrels of oil, or numbers of printed circuit boards manufactured over a certain period of time.

Value Added

A measure of the difference between the value of a finished product and the cost of the product inputs (e.g., raw materials) prior to any further manufacture, processing, or assembly.

Waste Exchange	A method of management of wastes that involves the transfer of wastes between businesses or facilities for recovery or to serve a productive purpose.
Waste Managed in Exempt Processes	Hazardous waste treated in units that are exempt from the RCRA Subtitle C permitting requirements and might not be counted in the 1991 Biennial Report. (See, e.g., 40 CFR 261.4.) Exempt processes include wastewater treatment units and elementary neutralization units.
Waste Management Facility	A location where hazardous waste is treated, disposed, stored, or recycled. A facility may have fully permitted units, interim status units, and/or exempt units. A generator is not referred to as a "facility" unless it also treats, disposes, stores, or recycles hazardous waste.
Waste Management Process	One or more units acting together to perform a single operation on a hazardous waste stream.
Waste Management System	One or more processes used together to treat, dispose, or recycle a hazardous waste stream.
Worker Training	The training of employees in the proper use, maintenance, and handling of toxic substances and hazardous wastes.

APPENDIX A.
NATIONAL OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN EXCERPTS

APPENDIX A. NATIONAL OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN EXCERPTS

The statutory requirements for capacity assurances have been codified in the National Oil and Hazardous Substances Contingency Plan (NCP) (40 CFR 300.510(e)).

Preamble to 40 CFR 300.510(e) Rulemaking
(55 *Federal Register 8666, 8778)*

In another change in this section, the language in § 300.510(e) describing the requirements for providing the waste capacity assurance has been revised to codify language from CERCLA section 104(c)(9) and to reflect the passage of the October 17, 1989 date for applicability of this assurance under CERCLA section 104(c)(9). EPA generally will use the following to determine the adequacy of the state's assurance: (1) The plan submitted to EPA documenting the waste capacity availability, (2) the state's written commitment to implement the plan, and (3) the state's written commitment to implement any additional measures EPA deems necessary to provide for adequate waste capacity (see Assurance of Hazardous Waste Capacity Guidance, OSWER Directive No. 9010.00 (December 1988) and OSWER Directive No. 9010.00a (October 1989)).

40 CFR 300.510(e)

(e)(1) In accordance with CERCLA section 104(c)(9), EPA shall not provide any remedial action pursuant to CERCLA section 104 until the state in which the release occurs enters into a cooperative agreement or Superfund state contract with EPA providing assurances deemed adequate by EPA that the state will assure the availability of hazardous waste treatment or disposal facilities which:

(i) Have adequate capacity for the destruction, treatment, or secure disposition of all hazardous wastes that are reasonably expected to be generated within the state during the 20-year period following the date of such cooperative agreement or Superfund state contract and to be destroyed, treated, or disposed;

(ii) Are within the state, or outside the state in accordance with an interstate agreement or regional agreement or authority;

(iii) Are acceptable to EPA; and

(iv) Are in compliance with the requirements of Subtitle C of the Solid Waste Disposal Act.

(2) This rule does not address whether or not Indian tribes are states for purposes of this paragraph (e).

APPENDIX B.
EPA REGIONAL CONTACTS

APPENDIX B. EPA REGIONAL CONTACTS

An original and one copy of a state's Phase 1 submittal, and Phases 2 and 3 CAP submittals, if necessary, should be delivered to EPA Regional offices on or before the due dates for the Phase 1, Phase 2, and Phase 3 CAP submittals. The following is a list of contact names, addresses, and phone numbers for the EPA Regions.

EPA Region	Contact Name	Phone Number	Fax Number	Address
Region I	David Lim	(617) 573-5776	(617) 573-9662	EPA-Region I RCRA Program (HPR-CAN1) JFK Federal Building Boston, MA 02203
Region II	Adolph Everett	(212) 264-8690	(212) 264-6155	EPA-Region II Hazardous Waste Facilities Branch (2AWM-HWF) 26 Federal Plaza-Room 1037 New York, NY 10278
Region III	Jeff Alper	(215) 597-9636	(215) 580-2013 (back-up fax: (215) 597-7906)	EPA-Region III Integrated Management Support (3HW53) 841 Chestnut Building Philadelphia, PA 19107
	Charlie Howard	(215) 597-6197		
Region IV	Bob Reimer	(404) 347-2234	(404) 347-5205	EPA-Region IV Waste Management Division 345 Courtland Street, N.E. Atlanta, GA 30365
Region V	Karen Lumino	(312) 886-0981	(312) 353-6775	EPA-Region V Waste Management Division (H-7J) 77 West Jackson Boulevard Chicago, IL 60604-3590
Region VI	Roger Hancock	(214) 655-8542	(214) 655-6460	EPA-Region VI Hazardous Waste Management Division (6H-CO) 1445 Ross Avenue Dallas, TX 75202
Region VII	Mary Clark	(913) 551-7738	(913) 551-7063	EPA-Region VII WSTM/PSBR/IRMS 726 Minnesota Avenue Kansas City, KS 66101
	Carl Blomgren	(913) 551-7680		

EPA Region	Contact Name	Phone Number	Fax Number	Address
Region VIII	Marie Zanowick	(303) 293-1065	(303) 293-1724	EPA-Region VIII Waste Management Division (8HWM-WM) 999 18th Street Denver, CO 80202
Region IX	John Moody	(415) 744-2054	(415) 744-1044	EPA-Region IX H-3-4 75 Hawthorne Street San Francisco, CA 94105
Region X	Maureen Toelkes	(206) 553-0758	(206) 553-0124	EPA-Region X Waste Management Division (HW-117) 1200 Sixth Avenue Seattle, WA 98101

APPENDIX C.
CAP TABLES

Table 1:
1991 Hazardous Waste Generated and Managed On Site (tons)

CAP Management Category	Waste Managed On Site
RECOVERY[a]	
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
TREATMENT[a]	
Stabilization/Chemical Fixation	
Incineration - Liquids and Gases	
Incineration - Sludges/Solids	
Fuel Blending	
Hazardous Wastewaters and Sludges Treatment	
DISPOSAL	
Landfill	
Deepwell/Underground Injection	
Land Treatment/Farming	
TRANSFER/STORAGE	
Transfer/Storage	

[a] Data may not be complete for these technologies because facilities are not required to report in the 1991 Biennial Report waste managed in exempt processes.

Table 2:
1991 Management of Hazardous Waste in Captive Systems (tons)

CAP Management Category	Exports	Waste Generated and Managed In State	Imports
RECOVERY			
Metals Recovery			
Inorganics Recovery			
Organics Recovery			
Energy Recovery - Liquids			
Energy Recovery - Sludges/Solids			
TREATMENT			
Stabilization/Chemical Fixation			
Incineration - Liquids and Gases			
Incineration - Sludges/Solids			
Fuel Blending			
Hazardous Wastewaters and Sludges Treatment			
DISPOSAL			
Landfill			
Deepwell/Underground Injection			
Land Treatment/Farming			
TRANSFER/STORAGE			
Transfer/Storage			

Table 3:
1991 Management of Hazardous Waste in Commercial Systems (tons)

CAP Management Category	Exports		Waste Generated and Managed In State		Imports[a]
	Recurrent	One-time	Recurrent	One-time	
RECOVERY					
Metals Recovery					
Inorganics Recovery					
Organics Recovery					
Energy Recovery - Liquids					
Energy Recovery - Sludges/Solids					
TREATMENT					
Stabilization/Chemical Fixation					
Incineration - Liquids and Gases					
Incineration - Sludges/Solids					
Fuel Blending					
Hazardous Wastewaters and Sludges Treatment					
DISPOSAL					
Landfill					
Deepwell/Underground Injection					
Land Treatment/ Farming					
TRANSFER/STORAGE					
Transfer/Storage					

[a] Imports cannot be divided into recurrent and one-time wastes due to limitations of information provided on Biennial Report WR forms.

Table 4:
Maximum Operational In-state Commercial Subtitle C Management Capacity - End of 1991 (tons)

CAP Management Category	Maximum Operational In-state Commercial Subtitle C Management Capacity
RECOVERY	
Metals Recovery	
Inorganics Recovery	
Organics Recovery	
Energy Recovery - Liquids	
Energy Recovery - Sludges/Solids	
TREATMENT	
Stabilization/Chemical Fixation	
Incineration - Liquids and Gases	
Incineration - Sludges/Solids	
Fuel Blending	
Hazardous Wastewaters and Sludges Treatment	
DISPOSAL	
Landfill	
Deepwell/Underground	
Land Treatment/Farming	
TRANSFER/STORAGE	
Transfer/Storage	

Table 5:
Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated In State (tons)

CAP Management Category	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013
RECOVERY				
Metals Recovery				
Inorganics Recovery				
Organics Recovery				
Energy Recovery - Liquids				
Energy Recovery - Sludges/Solids				
TREATMENT				
Stabilization/Chemical Fixation				
Incineration - Liquids and Gases				
Incineration - Sludges/Solids				
Fuel Blending				
Hazardous Wastewaters and Sludges Treatment				
DISPOSAL				
Landfill				
Deepwell/Underground Injection				
Land Treatment/Farming				
TRANSFER/STORAGE				
Transfer/Storage				

Table 6:
Expected Maximum In-state Commercial Subtitle C Management Capacity (tons)

CAP Management Category	Baseline	Maximum In-state Commercial Subtitle C Management Capacity		
		1993	1999	2013
RECOVERY				
Metals Recovery				
Inorganics Recovery				
Organics Recovery				
Energy Recovery - Liquids				
Energy Recovery - Sludges/Solids				
TREATMENT				
Stabilization/Chemical Fixation				
Incineration - Liquids and Gases				
Incineration - Sludges/Solids				
Fuel Blending				
Hazardous Wastewaters and Sludges Treatment				
DISPOSAL				
Landfill				
Deepwell/Underground Injection				
Land Treatment/Farming				
TRANSFER/STORAGE				
Transfer/Storage				

APPENDIX D.
BACKGROUND INFORMATION ON INTERNATIONAL EXPORTS

APPENDIX D. BACKGROUND INFORMATION ON INTERNATIONAL EXPORTS

Appendix D contains the following two items:

- Sample Office of Waste Programs Enforcement (OWPE) Annual Export Report; and
- List of Foreign Treatment, Storage, Disposal or Recycling Facilities.

Sample OWPE Annual Export Report for One State for 1990

40 CFR 262.56 requires primary exporters of hazardous waste to file with the Administrator, no later than March 1 of each year, a report summarizing the types, quantities, frequency, and ultimate destination of all hazardous waste exported from the United States during the previous calendar year. Such reports include the following:

- EPA identification number, name, and mailing and site address of the exporter;
- The calendar year covered by the report;
- The name and site address of each consignee; and
- By consignee, for each hazardous waste exported, a description of the hazardous waste, the EPA hazardous waste number (from 40 CFR Part 261, Subpart C or D), DOT hazard class, the name and US EPA number (where applicable) for each transporter used, the total amount of waste shipped, and number of shipments pursuant to each notification.

A "primary exporter" means any person who is required to originate a shipping manifest, in accordance with 40 CFR Part 262 Subpart B or equivalent state provision that specifies a treatment, storage, or disposal facility in a receiving country as the facility to which the hazardous waste will be sent and any intermediary arranging for the export. Both small quantity generators (SQGs) and large quantity generators (LQGs) are required to file OWPE Annual Export Reports. States should obtain copies of their OWPE Annual Export Reports through the Regional CAP Coordinator. Exhibit D-1 is a typical OWPE Annual Export Report for one state.

Exhibit D-1
Sample OWPE Annual Export Report

ANNUAL REPORTS FOR SELECT STATE: NH
FOR 1990

GENERATOR I.D. NO.: NHD084435654 — YEAR OF REPORT: 90
GENERATOR NAME : ELECTRO CIRCUITS, INC.
ADDRESS : O'SHEA INDUSTRIAL PARK
64 PRIMROSE DRIVE
LACONIA, NH 03246
TRANSPORTER 1 I.D. NO.: NT0000000000 — TRANSPORTER 1 NAME: UNKNOWN
TRANSPORTER 2 I.D. NO.: — TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 — CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: NO EXPORT
EPA WASTE NO. : F006 — DOT HAZARD CLASS : ORME
QUANTITY : .00 T
NO. OF SHIPMENTS : 0

GENERATOR I.D. NO.: NHD040244428 — YEAR OF REPORT: 90
GENERATOR NAME : ELECTROPAC CO., INC.
ADDRESS : 252 WILLOW STREET
MANCHESTER, NH 03103
TRANSPORTER 1 I.D. NO.: MAD062170890 — TRANSPORTER 1 NAME: JET-LINE SERVICES
TRANSPORTER 2 I.D. NO.: — TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 — CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL HYDROXIDE SLUDGE
EPA WASTE NO. : F006 — DOT HAZARD CLASS : ORME
QUANTITY : 40.60 T
NO. OF SHIPMENTS : 4

GENERATOR I.D. NO.: NHD086467223 — YEAR OF REPORT: 90
GENERATOR NAME : FRANKLIN NONFERROUS FOUNDRY, INC.
ADDRESS : P.O. BOX 35
CALEF HILL ROAD
FRANKLIN, NH 03235
TRANSPORTER 1 I.D. NO.: MAD080030356 — TRANSPORTER 1 NAME: JEFFREY CHEMICAL CO., INC.
TRANSPORTER 2 I.D. NO.: — TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 — CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: HAZARDOUS SOLID WASTE
EPA WASTE NO. : D008 — DOT HAZARD CLASS : ORME
QUANTITY : 18,180.00 P
NO. OF SHIPMENTS : 1

Exhibit D-1
Sample OWPE Annual Export Report (continued)

ANNUAL REPORTS FOR SELECT STATE: NH
FOR 1990

GENERATOR I.D. NO.: NHD001427475 YEAR OF REPORT: 90
GENERATOR NAME : GENERAL ELECTRIC COMPANY
ADDRESS : 31 INDUSTRIAL PARK
HOOKSETT, NH 03106

TRANSPORTER 1 I.D. NO.: MAD084814136 TRANSPORTER 1 NAME: FRANKLIN ENVIRONMENTAL SERVICES, INC.
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION : METAL HYDROXIDE SLUDGE
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 164,840.00 P
NO. OF SHIPMENTS : 6

GENERATOR I.D. NO.: NHD001091073 YEAR OF REPORT: 90
GENERATOR NAME : GENERAL ELECTRIC COMPANY
ADDRESS : 130 MAIN STREET
SOMERSWORTH, NH 03878

TRANSPORTER 1 I.D. NO.: NT0000000000 TRANSPORTER 1 NAME: UNKNOWN
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL FINISHING WASTEWATER TREATMENT SLU
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 99,960.00 P
NO. OF SHIPMENTS : 4

GENERATOR I.D. NO.: NHD991302522 YEAR OF REPORT: 90
GENERATOR NAME : HADCO CORPORATION
ADDRESS : HUDSON DIVISION
21 FLAGSTONE DRIVE
HUDSON, NH 03051
TRANSPORTER 1 I.D. NO.: MAD062179890 TRANSPORTER 1 NAME: JET-LINE SERVICES
TRANSPORTER 2 I.D. NO.: MAD000030356 TRANSPORTER 2 NAME: JEFFREY CHEMICAL CO., INC.
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL HYDROXIDE SLUDGE
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 141.00 Y
NO. OF SHIPMENTS : 6

Exhibit D-1
Sample OWPE Annual Export Report (continued)

ANNUAL REPORTS FOR SELECT STATE: NH
FOR 1990

GENERATOR I.D. NO.: NHD980668156 YEAR OF REPORT: 90
GENERATOR NAME : HADCO TECH CENTER 1
ADDRESS : 7 MANOR PARKWAY
SALEM, NH 03079

TRANSPORTER 1 I.D. NO.: MAD062179890 TRANSPORTER 1 NAME: JET-LINE SERVICES
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL HYDROXIDE SLUDGES
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 27,073.00 P
NO. OF SHIPMENTS : 1

GENERATOR I.D. NO.: NHD001078682 YEAR OF REPORT: 90
GENERATOR NAME : HITCHINER MANUFACTURING CO., INC.
ADDRESS : OLD WILTON ROAD, P.O. BOX 2001
MILFORD, NH 03055

TRANSPORTER 1 I.D. NO.: MAD981213903 TRANSPORTER 1 NAME: SUFFOLK SERVICES, INC.
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: WASTE CORROSIVE SOLID
EPA WASTE NO. : D002 DOT HAZARD CLASS : CORR
QUANTITY : 125,820.00 P
NO. OF SHIPMENTS : 4

GENERATOR I.D. NO.: NHD000769869 YEAR OF REPORT: 90
GENERATOR NAME : NASHUA CORPORATION
ADDRESS : 44 FRANKLIN STREET
NASHUA, NH 03061

TRANSPORTER 1 I.D. NO.: MAD981213903 TRANSPORTER 1 NAME: SUFFOLK SERVICES, INC.
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: CHROME HYDROXIDE SLUDGE
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 3.00 Y
NO. OF SHIPMENTS : 1

Exhibit D-1
Sample OWPE Annual Export Report (continued)

ANNUAL REPORTS FOR SELECT STATE: NH
FOR 1990

GENERATOR I.D. NO.: NHD001078062 YEAR OF REPORT: 90
GENERATOR NAME : TELEDYNE ELECTRO-MECHANISMS
ADDRESS : P.O. BOX 66
110 LOWELL ROAD
HUDSON, NH 03051
TRANSPORTER 1 I.D. NO.: MAD062179890 TRANSPORTER 1 NAME: JET-LINE SERVICES
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL HYDROXIDE SLUDGE
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 78,390.00 P
NO. OF SHIPMENTS : 4

GENERATOR I.D. NO.: NHD073974651 YEAR OF REPORT: 90
GENERATOR NAME : TERADYNE CIRCUITS DIVISION
ADDRESS : 4 PITTSBURGH AVE.
NASHUA, NH 03062

TRANSPORTER 1 I.D. NO.: MAD062179890 TRANSPORTER 1 NAME: JET-LINE SERVICES
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: METAL HYDROXIDE SLUDGE
EPA WASTE NO. : F006 DOT HAZARD CLASS : ORME
QUANTITY : 125,720.00 P
NO. OF SHIPMENTS : 4

GENERATOR I.D. NO.: NHD058537980 YEAR OF REPORT: 90
GENERATOR NAME : WATTS REGULATOR/WEBSTER VALVE
ADDRESS : SOUTH MAIN STREET
P.O. BOX 431
FRANKLIN, NH 03235
TRANSPORTER 1 I.D. NO.: NHD018912501 TRANSPORTER 1 NAME: LABRANCHE, INC.
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: LEAD CONTAMINATED FOUNDRY SAND
EPA WASTE NO. : D008 DOT HAZARD CLASS : ORME
QUANTITY : 32.00 Y
NO. OF SHIPMENTS : 2

Exhibit D-1
Sample OWPE Annual Export Report (continued)

ANNUAL REPORTS FOR SELECT STATE: NH
FOR 1990

GENERATOR I.D. NO.: NHD058637960 YEAR OF REPORT: 90
GENERATOR NAME : WATTS REGULATOR/WEBSTER VALVE
ADDRESS : SOUTH MAIN STREET
P.O. BOX 431
FRANKLIN, NH 03235
TRANSPORTER 1 I.D. NO.: NYD980762140 TRANSPORTER 1 NAME: SERVICES SANITAIRES BLAINVILLE, INC.
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: LEAD CONTAMINATED FOUNDRY SAND
EPA WASTE NO. : D008 DOT HAZARD CLASS : ORME
QUANTITY : 1,049.00 Y
NO. OF SHIPMENTS : 87

GENERATOR I.D. NO.: NHD982203838 YEAR OF REPORT: 90
GENERATOR NAME : Z-TECH CORPORATION
ADDRESS : 8 DOW ROAD
BOW, NH 03304

TRANSPORTER 1 I.D. NO.: NT0000000000 TRANSPORTER 1 NAME: UNKNOWN
TRANSPORTER 2 I.D. NO.: TRANSPORTER 2 NAME:
CONSIGNEE I.D. NO. : NYD980756415 CONSIGNEE NAME : STABLEX CANADA, INC.

WASTE NO. : 1
WASTE DESCRIPTION: NO EXPORT
EPA WASTE NO. : D002 DOT HAZARD CLASS : CORR
QUANTITY : .00 T
NO. OF SHIPMENTS : 0

Foreign Receiving Facilities and Waste Management Services

OWPE maintains a database of the Annual Export Reports. It has provided, for 1990-1992, a list of the foreign receiving facilities and the waste management services available at those facilities. Exhibit D-2 is not comprehensive and should be used only as a guide in assigning CAP Management Categories.

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports[1]

Anachemia Solvents, Ltd. 3549 Mavis Road Mississauga, Ontario Canada L5C 1T7	Solvent Reclamation, Possible Hazardous Waste Fuels Program
Anachemia, Inc. 135 Richer Ville St. Pierre Quebec, Canada	Transfer Facility
Breslube Division of Safety-Kleen P.O. Box 130 Regional Road 17 Breslau, Ontario NOB1MO	Waste Oil Re-Refinery
Capper Pass & Sons, Ltd. North Ferriby North Humberside England	Secondary Lead Smelter, Metals Recovery
Catalyst Recovery of Canada, Ltd. 2159 Brier Park Place, N.W. Medicine Hat, Alberta T1A 7E3	Reclaim Refinery Catalyst
Cominco Metals Division of Comicon Ltd. Trail, British Columbia Canada	Primary Ore Smelter

[1] Information obtained from National Enforcement Investigations Center (NEIC).

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports (continued)

Davy McGee Bowesfield Lane Stockton-On-Tees Cleveland TS18 3HA England	Metals Reclamation
Degussa Ag-Geschaftsbereich, Edelmetall-Handel Und-Scheidung Postface 1345 Rodenbachen Chaussee 4 D-6450 Hanau (Stadtteil Wolfgang)	Metals Reclamation
Ekokem Ltd P.O. Box 181, SF-11101 Rilhimaki, Finland	Hazardous Waste Incinerator
Euromet Hyde House The Hyde Edgeware Road London, England	Metals Recovery
Falconbridge Ltd. Sudbury Operations Sudbury, Ontario Canada POM 1S0	Primary Nickel Smelter
Hevmet Metal Recovery 203 Durham Street Port Colborne, Ontario	Physical/Chemical Treatment, Metals Reclamation
Falconbridge Ltd. Sudbury Operations Sudbury, Ontario Canada POM 1S0	Primary Nickel Smelter
Hevmet Recovery Limited 203 Durham Street Port colborne, Ontario Canada L3K FW1	Physical/Chemical Treatment, Metals Reclamation
Hevmet Recovery Limited 80 Davis Street Port Colbourne, Ontario Canada L3K 5W1	Physical/Chemical Treatment, Metals Reclamation

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports (continued)

Johnson Matthey PLC Orchard Road, Royston Hertfordshire SG8 5HE England	Precious Metals Reclamation
L'Environment Eaglebrook Quebec Ltd 3405 Boulevard Maire-Victorin Varennes, Quebec J3X 1T6 Canada	Physical/Chemical Treatment
Laidlaw Environmental Services (Mercier) 1294 Blvd. Ste-Marguerite Ville Mercier, Quebec Canada H6R 2L1	Hazardous Waste Incinerator, Transfer Station
Laidlaw Environmental Services (Quebec) C.P. 280, 5E Range Thurso, Quebec Canada J0X 3B0	Transfer Station
Laidlaw Environmental Services (Quebec) 6785 Route 132 CP 5900 Ville St. Catherine, Quebec Canada J0L 1E0	Transfer Station
Laidlaw Environmental Services (Sarnia) RR #1 Corunna, Ontario Canada N0N 4B1	Hazardous Waste Incinerator, Landfill, Physical/Chemical Treatment
Laidlaw Environmental Services, Ltd. 1829 Allenport Road P.O. Box 188 Thorold, Ontario Canada L2V 3Y9	Lab Pack Incinerator, Repackaging of Lab Packs for Transfer to Other TSDFs
Metaleurop GMBH Rammelsberger Str. 2, P.O. Box 2330/2340 D-3380 Goslar, Germany	Metals Recovery

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports (continued)

Metaleurop GMBH Rammelsberger Str. 2, P.O. Box 2330/2340 D-3380 Goslar, Germany	Metals Recovery
Metaleurop, S.A. Peripole 118 58 Rue Roger Salengro 94126 Fontenay-Sous-Bois CEDEX France	Metals Recovery
Metallurgie Hoboken Overpelt Co. Adolf Greinerstraat 14 B2710 Hoboken, Belgium	Precious Metals Recovery
MHO S.A. Rue Dumarais 31 Broekstraat Bruxelles, Belgium	Precious Metals Recovery
NE Chemcat Corporation 4-1 Hamamatsucho 2-Chome Minato-KU, Tokyo Japan	Metals Reclamation
NIFE AB S-572-01 Oskarshamn, Sweden	Nickel-Cadmium Metals Reclamation
Nippon Rate Metal, Inc. 1200 Nakayama CHO Midori-KU, Yokohama Japan	Precious Metals Reclamation
Noranda Minerals, Inc. Division of Horne & Chadbourne 150 Portelance P.O. Box 4000 Rouyn-Noranda, Quebec	Primary Copper Smelter
Noranda Mines Mines Gaspe Division Murdockville, Quebec Canada	Metals Reclamation

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports (continued)

Nova PB Inc. 1200 Rue Garnier St. Ville Ste-Catherine Quebec, Canada J0L 130	Secondary Lead Smelter
Outokumpu Oy/Metallurgy Division P.O. box 26 S.F. 67101 Kokkola, Finland	Physical/Chemical Treatment, Metals Reclamation
Quay Minerals, Ltd. Flixborough South Humberside DN 15 8RT England	Metals Reclamation from Refractory Brick
S.N.A.M Rue De La Garenne Z.I. De Chesnes Tharabie B.P. 733 - 38297 st Quentin Fallavier Cedex - France	Nickel/Cadmium Battery Processing, Metals Reclamation
Saft Nife AB S-572-01 Oskarshamn, Sweden	Nickel/Cadmium Metals Reclamation
St. Lawrence Cement, Inc. 2391 Lakeshore Road West Mississauga, Ontario Canada L5J 1K1	Cement Manufacturer Using Hazardous Waste Fuel
Stablex Canada, Inc. 760 Industrial Blvd. Blainville, Quebec Canada J7C 3V4	Chemical/Physical Treatment, Waste Solidification, Landfill
Systech Environmental Corporation P.O. Box 218, Lafarge Road Ste. Constant, Quebec Canada J0L 1X0	Hazardous Waste Fuel Blender Transfer Station
Ticor Technology Ltd 4623 Byrne Road Burnaby, British Columbia Canada U5J 3H6	Thermal Treatment for Recovery of Paint Pigment Components

Exhibit D-2
Active Foreign Receivers For 1990-1992
Hazardous Waste Exports (continued)

Waith Aluminum Moore Lane - Wath of Deorne South Yorkshire, United Kingdom	Metals Reclamation
Zinc Nacional SA Hidalgo Pte 674 APDO Postal #985 Monterrey, Neuvo Leon Mexico	Thermal Treatment of Emissions Control Dust from Electric Arc Furnace at Steel Mills for Recovery of Zinc Oxide, Cadmium and Lead Sulfate

APPENDIX E.
CONVERSION FACTORS

APPENDIX E. CONVERSION FACTORS

Exhibit E-1 presents the conversion factors that should be used to convert the quantities reported in the 1991 Biennial Report to short tons (i.e., English tons). Convert quantities to short tons by multiplying the reported quantities by the appropriate conversion factor. If the quantities provided in the Biennial Report are given as volumetric quantities, the volume should be converted to weight using the provided density and then converted to short tons.

Exhibit E-1
Conversion Factors for Converting 1991 Biennial Report Quantities to Short Tons

Unit of Measure	Conversion Factor[a]
Pound	0.000500
Short ton (2,000 lbs)	1.000000
Kilogram	0.001102
Metric ton (1,000 kgs)	1.102311

[a] Multiply quantity by conversion factor to convert to short tons.

Example:

100,000 metric tons X 1.102311 short tons/metric tons = 110,231.1 short tons

APPENDIX F.
REGULATORY CHANGE PROJECTIONS

F.1 Boilers and Industrial Furnaces Rule

The Burning of Hazardous Waste in Boilers and Industrial Furnaces (BIF) Rule set emission levels for toxic metals, particulate matter, chlorine, and hydrogen chloride and removal efficiency requirements for toxic organics, dioxins, and furans.[1] The BIF rule could affect both the demand for and supply of hazardous waste management capacity.

By August 21, 1991, owners or operators must have submitted to EPA Regional or state offices a certification of precompliance stating that, based on engineering judgment, their units meet the requirements of the rule. If owners or operators did not meet this deadline, they were required to stop all hazardous waste burning at the facility and commence closure of the BIF. Owners or operators that certified precompliance had until August 21, 1992 to conduct tests and install monitoring equipment to certify compliance with full interim status requirements or request an extension.

Analysis conducted by EPA on how the BIF rule would affect treatment capacity indicates that large BIFs already have or will install emissions control equipment that can meet the requirements of the rule; therefore, they will likely continue burning hazardous wastes. Smaller BIFs, however, may not be able to economically justify installing emissions control equipment and would therefore stop burning hazardous wastes. (EPA, however, has not estimated the recent or expected increase or decrease of BIF capacity for burning hazardous wastes.) As a result of on-site and captive BIF closures, hazardous waste management may shift to captive or commercial facilities.

Although EPA is not requiring it, states may want to evaluate the effect of the BIF rule on Subtitle C hazardous waste management capacity and demand. In some states, there may actually be significant increases in BIF capacity, which the state may want to include in its projections of hazardous waste management capacity. BIF capacity should be counted in the energy recovery CAP Management Category.

Potential BIF Rule Data Sources

States that decide to examine the impact of the BIF rule should consider using the following data sources.

Facility Compliance Information

The BIF rule requires owners and operators of BIFs to meet new standards while operating under interim status or when applying for or operating under a RCRA permit. Certifications of precompliance and compliance must be submitted to EPA Regional or state

[1] 56 *Federal Register* 7134, February 21, 1991.

offices by the established deadlines: August 1991 for precompliance, August 1992 for compliance, or August 1993 for compliance if a one-year extension is requested. These certifications, used in conjunction with the information from the Biennial Report, will allow states to determine which BIFs have closed, intend to close, or have recently come on line. EPA and state enforcement offices may also have useful information on BIF compliance status.

***RCRA Information System Database (RCRIS).* U.S. EPA, Office of Solid Waste.**

RCRIS is a national database for tracking facilities that handle hazardous wastes. RCRIS contains data on facilities regulated under RCRA, some exempt sites, some closed sites, as well as non-notifiers, which are sites that did not notify EPA of hazardous waste activities, but which were discovered to be handling hazardous wastes. RCRIS contains specific information on the type of facility, waste management processes, capacity, waste handling, and quantities of waste handled. RCRIS tracks the facilities through their cycle of activities (i.e., operating, closure, and post-closure care). In addition, it allows EPA Regions and states to group facilities into industrial process categories, which allows authorities to make generalizations about particular groups affected by the BIF rule. RCRIS also contains data about enforcement activities at facilities, including records of facility reviews, on-site inspections, violations, and any corrective actions.

***Background Document for Capacity Analysis for Newly Listed Wastes and Contaminated Debris to Support 40 CFR 268 Land Disposal Restrictions (Final Rule) (Volume 1).* U.S. EPA, Office of Solid Waste. June 1992.**

This background document provides general information on the rulemaking and facility-specific hazardous waste generation and management information on newly listed Phase I wastes other than petroleum refining wastes and contaminated debris. The document includes a chapter on commercial treatment capacity that contains facility-specific data on cement kiln and incinerator capacity.

F.2 FUTURE REGULATORY CHANGES

This section contains information as of March 1993 on the Phase II and III land disposal restrictions. EPA is providing this information to states to alert them to potential changes in regulations that may have to be accounted for in future CAPs. States should note that court rulings on litigation involving EPA regulations may affect the Land Disposal Restrictions (LDR) program and may lead to changes in the following information.

LDRs for Newly Identified and Listed Wastes and Contaminated Soil -- Phase II

Phase II LDRs would restrict the land disposal of the following wastes: (1) wastes that have been recently identified as characteristically hazardous due to the presence of 25 organic constituents identified in the recent toxicity characteristic (TC) rule (D018-D043); (2) coke and coke by-product wastes (K141-K148); (3) chlorotoluene wastes (K149-K151); and (4) soil contaminated with the above wastes.[2] The rule may also modify existing standards for soil contaminated with listed wastes.

EPA expects TC wastes and contaminated soils to be the most significant wastes for the Phase II LDRs. (As already indicated, estimates for contaminated soils will be developed by EPA.) The primary source of capacity-related data for TC wastes is the draft Regulatory Impact Analysis and Background Information Documents being prepared for the TC rulemaking. Based on currently available information, EPA estimates that 50,000 tons of TC organic liquid wastes are generated annually; however, the amount of these wastes requiring commercial treatment is uncertain. Approximately 2 million tons of sludges and slurries exhibiting TC are generated annually. There is, however, uncertainty in how much of the total sludge and slurry quantity exhibit TC for organic constituents (some of the sludges and slurries may exhibit TC for inorganic constituents), and how much of these wastes require commercial treatment. EPA is considering options for specifying treatment based on technology type or concentration; therefore, the treatment technologies that will be used for these TC wastes is uncertain at this time.

LDRs for Newly Identified and Listed Wastes -- Phase III

Phase III LDRs would restrict the land disposal of the following wastes: (1) wood preserving wastes generated by the wood preserving industry (F032, F034, and F035); (2) spent potliners removed from electrolytic cells at primary aluminum reduction facilities (K088);

[2] 56 *Federal Register* 55160, October 24, 1991.

and (3) listed mineral processing wastes generated from the processing of ores and minerals (K064, K065, K066, K090, and K091), if relisted. In Phase III, EPA will also develop treatment standards for newly identified characteristic mineral processing wastes. Many of the waste streams were considered special wastes by the generators and were assumed to be excluded by RCRA Subtitle C requirements until EPA conducted a study of mineral processing wastes. In 1989, EPA identified the mineral processing wastes that are excluded from Subtitle C requirements. EPA believes that over 250 "newly identified" characteristic mineral processing wastes are currently subject to Subtitle C requirements.[3]

Data on Phase III wastes are incomplete. EPA is currently collecting data on these wastes from industry in preparation for the proposed LDR rule for Phase III wastes. According to preliminary EPA analyses, about 635,000 tons of F032, F034, and F035 wastes are generated annually. EPA is currently requesting information from industry to determine the quantity of wood preserving wastes that will be affected by LDRs. Preliminary assessments of treatment methods indicate that organic wood preserving wastes will likely undergo thermal destruction prior to land disposal, and inorganic wood preserving wastes will probably require recovery and stabilization as treatment.

EPA estimates that about 130,000 tons of spent potliners are generated every year. Of this amount, about 105,000 tons will require treatment once the Phase III LDRs become effective. Since spent potliners are primarily large blocks of carbon containing fluoride and cyanide, these wastes will most likely affect capacity requirements for thermal destruction (e.g., incineration or fuel substitution).

EPA has also requested information on the generation and management of characteristic and listed mineral processing wastes. These wastes are hazardous because they contain toxic metals or are corrosive. EPA expects that treatment of mineral processing wastewaters will affect capacity requirements for chemical precipitation, reverse osmosis, cation exchange, and electrolysis technologies, while treatment of mineral processing nonwastewaters will affect capacity requirements for stabilization, high temperature thermal recovery, and hydrometallurgical technologies.

[3] Ibid.

APPENDIX G.
WASTE MINIMIZATION

G.1 Approaches for Estimating Future Waste Minimization

This section provides more detailed guidance on alternative approaches that states can use to estimate future waste minimization efforts. EPA will evaluate states' forecasts as discussed in Chapter 4 of this Guidance document. As introduced in Chapter 4, there are at least three approaches that states may find helpful for developing estimates of the future reduction in industrial generation of hazardous waste:

- Generator surveys;
- Engineering literature reviews; and
- Historical data.

These approaches are not necessarily mutually exclusive. In fact, it may be in a state's best interest to pursue more than one approach and to use the data from one source to verify another.

Some of the approaches described in this Guidance may require a significant level of effort to derive estimates. As a result, groups of states may wish to work collectively in order to support a more substantial waste minimization analysis than any single state might undertake on its own. In addition, collective efforts among states may offer some economies of scale for analysis.

Generator surveys provide information on what generators themselves predict they can accomplish in reducing waste generation. When properly designed and executed, generator surveys can provide reasonable estimates of the future potential to reduce waste generation.

Engineering literature reviews can provide information on the potential for reducing waste in a particular industry and process, but cannot confirm whether generators have yet achieved any of this potential. Engineering literature reviews are often an important starting point for any projection effort. They are useful to initiate an on-going dialogue with key generators and form the basis for more robust approaches for estimating waste reduction potential.

Analysis of historical data provides some insight into an industry's potential to reduce waste, depending on the strength of the methodology, but the results should be validated. As discussed in section 4.2, there are limitations with analysis of historical data. Without field validation, it could be difficult to accurately project future waste minimization based on past information. Data analysis also is relatively resource intensive, but can be accomplished with existing sources of data. Data analysis may be the most feasible

approach to estimate waste reduction potential for a large number of facilities within a wide variety of industries.

These approaches, applied to varying degrees, provide a system for producing reasonable projections of waste minimization.

Generator Survey/Plan

Many states have found that generators themselves may be reliable sources of information on future levels of waste reduction. Critical to the usefulness of generator survey results, however, are a well-structured survey instrument, a statistically sound sampling plan (or a census of key industries), and corroborating questions that provide a check on the generators' understanding of the questions and presentation of answers.

Description of Surveys

A survey is a systematic way to collect information about the characteristics of an entire population by contacting and interviewing either all of its members or only a sample of the members of that population. To estimate future waste minimization efforts, surveys could be used to gather information on the potential to reduce generation of hazardous waste at the facility and process levels.[1] In cases where relatively few facilities generate the majority of a state's waste, a survey can be designed and conducted to produce results similar to that of a census. In fact, data from EPA's 1986 Generator Survey showed that 20 percent of all facilities generate 80 percent or more of all waste, suggesting that this approach could be appropriate for some states. Depending on the concentration of waste generation among facilities in a particular state, it may be advantageous to contact only the largest generators and use these results to develop a reliable projection of the future potential to reduce waste statewide.

In cases where waste generation is more evenly distributed across a large number of industries and facilities within industries, the survey design should incorporate statistically valid sampling approaches to ensure that the sample results are representative of the target population. This method requires some form of random sampling. If a random sample is used, it is important that projections regarding the entire target population derived from these data are statistically valid.

Information is collected using a survey instrument or questionnaire that includes explicit instructions and a script or protocol of individual questions. Questions may be either open-ended (i.e., allowing flexibility in response), or closed-ended (i.e., responses to be drawn from among a finite group of choices). This structure makes the interview process more efficient and increases the consistency and comparability of responses. The questionnaire and its questions should be designed to render the respondent able and willing to answer as completely and accurately as possible, minimize the burden on the respondent, and ensure there is no misunderstanding about the meanings intended by either the

[1] While process level knowledge is not strictly essential, it may be helpful if states wish to compare survey results with information from other approaches (e.g. a review of engineering literature).

interviewer or the respondent. Responses may be qualitative or quantitative. One advantage of the sample survey is that quantitative projections or inferences about an entire population can be based on the responses of a sample.

In the past, states have administered waste minimization surveys successfully using three basic methods or a combination of these methods:

- Mail surveys with self-administered questionnaires;
- Telephone surveys using trained interviewers; and
- On-site visits using personal interview techniques.

One particularly effective combination is a mail survey with telephone follow-up.

Engineering Literature Review

A review of engineering literature provides information on technological and economic opportunities for certain industries to reduce the generation of certain types of wastes. Typically, the literature contains process-specific profiles that include the following types of information:

- Description of the industry, process, and product, including a flow diagram of the process;
- Descriptions of the waste reduction alternatives employed, including as appropriate, discussions on process modification, product or input substitution, materials recovery and recycling, and housekeeping adjustments;
- Waste reduction potential for each of the above, in terms of the expected percent reduction or tons reduced of specific EPA waste-types;
- Description of the process or other engineering modifications necessary to achieve reduction;
- Economics of waste reduction alternatives;
- Limitations and constraints on waste reduction alternatives;
- Applicability to other industries and processes; and
- References for additional information.

Purpose of a Review of the Engineering Literature

A review of the engineering literature can help to verify the validity of waste reduction forecasts made for a particular industry and waste stream. The engineering literature typically provides case studies that detail what an exemplary facility achieved by implementing waste minimization techniques. Such case studies usually provide a high estimate of the waste reduction potential for the particular process and waste type. This estimate can serve as an upper bound to evaluate whether a projected reduction is technologically and economically feasible.

Limitations of a Review of the Engineering Literature

While a review of the engineering literature can suggest the potential for waste reduction, it does not provide sufficient information to project waste reduction. For example, a review of the engineering literature may not provide (1) facility-specific information for facilities in a particular state, (2) data on waste reduction activities already being undertaken by facilities in a particular state, or (3) information to assess the range of possible reductions across an industry.

Facility Specific Information. While the engineering literature is specific in that it often reports actual achievements of a specific process at a specific facility, the literature provides only general guidance across an industry. Ranges of reductions are typically not provided to account for the variations across different facilities in that industry. For this reason, it would be inappropriate to use the information provided by the review alone to judge the validity of industry-wide estimates of future waste reductions. Instead, information provided by the review should be used as a basis to develop a dialogue with the facilities in the state to better evaluate the validity of projections.

Basis for Making Projections. As noted above, literature profiles alone are insufficient to project waste reduction at the state level. The information provided by the review, taken alone, does not indicate whether and to what extent an industry has already adopted waste reduction opportunities. If, for example, the literature suggests that a process in a particular industry can achieve 90 percent reduction of a K047 waste stream over the next five years, but many facilities in that industry have already begun to use this process, then the potential future reduction overall is well below 90 percent.

Again, the engineering literature provides an upper bound, which may be useful to improve the understanding of facility-specific information as it is gathered from other sources.

Range of Possible Reduction Levels. The literature typically provides a high-end estimate of potential waste minimization for an exemplary facility; therefore, the information provided by the review of the engineering literature does not adequately characterize the range in levels of reduction for all facilities in a particular industry. Facility-specific data may be a more appropriate source of such information.

Sources for Engineering Literature

EPA has identified the following information sources for states gathering industry-level engineering literature for evaluating the feasibility of waste minimization projections:

- National Source

  - **EPA's Pollution Prevention Information Exchange System (PIES)** is a 24-hour computerized national database containing literature and case studies for 4-digit SIC industries.

- Regional Sources

  - **Hazardous Waste Research and Information Center (HWRIC)**, a division of the Illinois Department of Energy and Natural Resources, operates a user-friendly computerized case study database (WRAS), which is in the process of being merged with PIES;

  - **The Solid and Hazardous Waste Education Center, University of Wisconsin-Madison** houses the Great Lakes Technical Resource Library (GLTRL), which uses INMAGIC library software as a personal computer (PC) interface;

  - **Northeast Multimedia Pollution Prevention Program (NEMPP)** provides pollution prevention information to the public, industry representatives, and state officials throughout the Northeast. NEMPP plans to make all of the information in their clearinghouse available in a section of PIES called the Northeast Mini-Exchange;

  - **Pacific Northwest Pollution Prevention Research Center**, is a non-profit public-private partnership dedicated to the goal of furthering pollution prevention in the Pacific Northwest. Currently, the Center has a limited amount of literature on waste reduction potential, but is actively seeking to expand its holdings through cooperative alliances with other state and regional sources of information, such as universities, state technical assistance programs, and private industry; and

  - **Waste Reduction Resource Center for the Southeast (WRRC)**, housed in North Carolina, provides multimedia waste reduction support for the eight states of U.S. EPA Region IV. The Center has a collection of technical waste reduction information from the national level, all 50 states, and numerous private sources.

Analysis of Historical Data

Taking into account the limitations discussed in section 4.2, analysis of past and current waste generation characteristics of generators, combined with field validation, may be useful to help assess the future potential for individual generators (or industries as a whole) to reduce waste. There are many types of data analyses that can be designed to reveal insights about waste reduction potential and may be most useful in conjunction with surveys or other tools.

The following sections describe two alternative types of data analyses. The first is a cross-sectional analysis that compares waste generating characteristics of similar facilities across industries. The second is a time-series analysis that calculates trends in waste reduction accomplishments at a single facility over a period of time using data from the Biennial Report.

Cross-sectional Analysis

Cross-sectional analysis has two components: (1) a statistical comparison of the relative production efficiencies of apparently similar facilities producing similar products and similar waste streams, but different rates of waste generation per unit of product, and (2) field validation of the inferences drawn from the statistical comparison. Its usefulness as a tool to project future potential to reduce waste generation is based on the assumption that some firms have already implemented waste minimization efforts and others have not. Differences in waste generation characteristics among firms in the same industry may give some indication of unrealized opportunities for waste reduction. The more efficient facilities provide some indication of where others in the industry may reasonably be expected to be at some time in the future.

The first step in analyzing differences between facilities is collecting the necessary raw data on how much waste was produced by each firm in a base year, broken down by the type of waste and industry. Sources of such data include the Biennial Report, state annual generator surveys, manifest data, or other surveys. States will also need facility-level output data, which typically must be added from state sources of industrial economic information, such as economic development commissions, bureaus of labor or economic statistics, or state business councils.

Of course, not all of the differences in waste generation characteristics at similar plants are attributable to the prior adoption of waste reduction techniques. Other explanations could include errors: (1) in reporting industrial category, (2) in rates of waste generation, and (3) in identification of the type of waste. In addition, not all of the differences in unit waste generation characteristics across similar plants can be counted as potential opportunity for waste reduction. Even with favorable economics and ready access to information regarding what technologies or techniques to use to reduce waste generation, some generators may never make the needed changes.

The key to the ultimate usefulness of cross-sectional analysis as a tool for projecting estimates of future waste minimization is the extent to which a state conducts follow-up activities designed to evaluate how much of the statistical difference in waste generation characteristics is attributable to potential waste reduction and how much of this potential can

be realized. Even where statistical inferences regarding the relative efficiencies of two or more plants are unclear, differences in unit waste generation characteristics provide states with insights that may be useful in a targeted technical assistance program. For example, states may be able to transfer information regarding waste reduction opportunities from the more efficient facilities to the less efficient ones.

Cross-sectional analysis is more useful for some industries than for others. In certain industries, for example, facility-level waste generation rates differ largely because some facilities have already employed waste reduction techniques including changes in equipment, processes, product design, choice of inputs, and housekeeping practices. To the extent that facilities producing the most waste per unit of product are able to imitate the practices of those facilities that produce the least waste per unit of product, statistical analysis of waste generation rates allows states to observe differences in facilities. Exhibit G-1 compares conditions under which cross-sectional analysis would and would not be useful in projecting waste minimization.

Exhibit G-1
Usefulness of Statistical Analysis in Projecting Waste Minimization

Criterion	Indicates High Usefulness	Indicates Low Usefulness
Number of Facilities in the Specific Industry	More than Five	Fewer than Five
Type of Waste	K, P, and U Waste Streams	D and F Waste Streams
Nature of Product	Single-Product Industry	Multiple Products All Under Same SIC Code
Information Available on Product Output	Actual Measures of Output of Product	Only Indirect Indicators (e.g., Employment, Sales, and Value added)
Number of Industries Requiring Analysis	Many (i.e., > 20)	Few (i.e., < 20)

The key component of the cross-sectional statistical approach is the comparison across facilities of unit waste generation factors (i.e., units of waste per unit of product) for each type of waste generated by the industry in question. While there are various ways to conduct this analysis, the following steps illustrate one approach:

For each waste type in a given industry (so-called "industry-waste pairs"):

- **Select data** that exclude waste types with fewer than roughly five facilities.
- **Compute facility-level "R" factors** (i.e., units of waste generated per unit of product).
- **Rank facilities from lowest to highest R factor.**

- **Segment facilities**. Depending on the number of observations, divide facilities into groups that represent a range in values. With five or more facilities, quartiles -- four groups with the same number of facilities in each group -- may be useful.

- **Estimate potential for reductions under various scenarios**. Assume a range of scenarios for waste minimization. One such choice is low, medium, and high, where facilities with high R factors pursue waste reduction sufficiently over the planning period to attain lower R factors. The choices of which facilities, how much waste reduction they achieve, and over what period are somewhat arbitrary at this stage of the planning process.

- **Translate changes in R factors to tons of waste reduced and aggregate at the industry level.** Based on changes in the R factor at each facility, add reductions in tons -- not tons per unit of product -- to find total tonnage reduction for the industry-waste pair as a whole.

- **Validate projections with experts and literature.** Adjust the results of this statistical analysis based on estimates from industry experts and engineering process analysis. Determine time period over which reduction can reasonably be expected to take place. Focus groups of industry experts may be useful to facilitate this field verification process.

- **Incorporate validated results in re-estimates** of potential waste reduction for all applicable industry waste type pairs. Re-estimate potential tons reduced for each industry waste type pair of interest.

Time-Series Analysis of Biennial Report Form IC and GM Data

Analysis of information reported on Forms IC and GM of the Biennial Report, combined with field validation, also may be useful for projections. These forms ask generators to provide information regarding changes in production from the previous year to the reporting year and the actual tons of waste generated in each year. For all generators that complete these forms, waste reduction accomplishments could be estimated using the following formula:

$$\text{Percentage Waste Reduced} = \frac{(P \times Q_{1992}) - Q_{1993}}{P \times Q_{1992}}$$

where P = Production Ratio Between 1992/1993 = $\frac{\text{Units of Product Produced in 1993}}{\text{Units of Product Produced in 1992}}$

Q_{1992} = Tons of Waste Generated in 1992

Q_{1993} = Tons of Waste Generated in 1993

Waste reduction between the previous year and the reporting year is calculated as the difference between what would have been generated strictly on the basis of changes in production levels, assuming no changes in process technology, and what was actually generated.

This approach requires less data and analysis than does the cross-sectional analysis. Its usefulness, however, is directly related to whether a sufficient number of the generators report the necessary information and whether the analytical results are validated in the field. In addition, because this type of analysis considers only the changes made at a single facility over time, it may be difficult to extrapolate results from that facility to the entire industry without combining this analysis with other approaches. Time series analysis is quite useful, however, for measuring progress in attaining waste reduction goals. Hence, time series studies may be an appropriate method to demonstrate progress under the criteria.