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November 19, 2014

Via Federal Express and E-mail –CWM.RWMUNIT2@dec.ny.gov

James T. McClymonds
Chief Administrative Law Judge
NYSDEC Office of Hearings and Mediation Services
625 Broadway, 1st Floor
Albany, NY 12233-5500

Re: CWM Chemical Services, LLC
Application for Hazardous Waste Facility Siting Certificate and
Application to Modify Hazardous Waste Management Permit

Dear Judge McClymonds:

These comments are submitted on behalf of CWM Chemical Services, LLC ("CWM"), the applicant for a Siting Certificate and a modification of the CWM Model City Hazardous Waste Management Permit both related to proposed RMU-2. These comments are focused on the demand and capacity information used in the 2010 New York Hazardous Waste Facility Siting Plan ("Plan"). Under separate cover, CWM is submitting comments on the draft RMU-2 modifications to the Model City Part 373 Permit.

A. The Statutory Provisions

ECL § 27-1102.2(f) required the DEC to prepare a Siting Plan which was to include a determination regarding "facilities that will be needed for the proper long-term management of hazardous waste consistent with the assurances required pursuant" to ECL § 27-1102.1. The § 27-1102.1 required assurances relate to the availability of facilities to manage all hazardous wastes expected to be generated in New York over the next twenty (20) years ***with such facilities to be located in New York or to be available to New York generators in accordance with interstate agreements***.

ECL § 27-1105.3(f) provides that the Siting Board should deny an application for a Siting Certificate for a new or expanded facility "if it is not consistent with [the] plan or if the need for such facility is not identified in [the] plan and the board finds that the facility is not otherwise necessary or in the public interest." Thus, to obtain a Certificate, the proposed new or expanded facility must be consistent with the Plan, or the need for the facility must be identified in the Plan, or the Board must find that the facility is otherwise necessary, or that it is in the public interest.

B. The Plan

The Plan was adopted in October 2010 (twenty years after its due date), and it concludes that "there is sufficient capacity within and beyond New York's borders for the management of the hazardous waste presently generated within New York State." It also concludes that interstate agreements are not required to assure New York generator's access to out-of-State facilities.

The introduction to the Plan explains that, since the Plan requirement was adopted in 1987, much has changed in the hazardous waste management industry, including EPA's 1996 determination, confirmed in 2009, "that there is sufficient national capacity" to meet the expected national disposal needs for "recurrent" wastes for the next twenty (20) years. The Plan also relies on EPA's determination not to require each state to make its own capacity assurances.[1] The Plan states that EPA has assumed responsibility for the capacity assurance program, dropping the need for interstate agreements.

The Plan looks at hazardous waste generated in New York from the perspective of present industry practices concluding that state borders are not a major factor in the business or regulatory approach to hazardous waste management. As a result, unlike the statutory provisions requiring a Plan, the Plan's findings, recommendations and guidance reflect a national-not statewide-perspective in determining the hazardous waste management "needs" of New York State.

The Plan explains that the national regulatory perspective derives from the federal RCRA Subtitle C Program which established a national "cradle to grave" approach to all hazardous waste management. RCRA authorizes the individual states to apply to EPA to be delegated to operate the federal RCRA program within their borders. In order to qualify to implement the federal RCRA program, a State's regulatory and permitting standards must meet and be consistent with the federal RCRA regulatory and permitting requirements for hazardous waste management. Almost all States are delegated to implement the RCRA program. As a result, the Plan concludes that interstate agreements are not necessary to assure the proper management of hazardous wastes sent from New York for disposal or treatment in other States.

The Plan (Intro-6) describes the aspects of the RCRA program that were adopted to promote the national character of the hazardous waste industry, to assure access to out-of-state facilities, and to prohibit any barriers to interstate commerce.

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[1] 42 U.S.C. § 9604(c)(9) provides that, after October 17, 1989, the President shall not provide any CERCLA-funded remedial actions unless the State where the site is located provides assurances for the availability of hazardous waste treatment or disposal facilities with adequate capacity for the wastes expected to be generated in that State during the next twenty (20) years, where such facilities are within the State or outside the State and available in accordance with an interstate agreement. This same "assurance" language is contained in ECL § 27-1102.1. The purpose of the Plan was to provide a basis for New York to make such assurances relying on in-state capacity.

Federal regulations, in 40 CFR 271.4(a), state that: "Any aspect of the State program which unreasonably restricts, impedes, or operates as a ban on the free movement across the State border of hazardous wastes from or to other States for treatment, storage or disposal at facilities authorized to operate under the federal or an approved State program shall be deemed inconsistent." Because no state can inhibit the interstate transport of hazardous waste, all generators are allowed access to treatment, storage and disposal facilities across the country.

The federal regulation goes on to state that: "any aspect of State law or of the State program which has no basis in human health or environmental protection and which acts as a prohibition on the treatment, storage or disposal of hazardous waste in the State may be deemed inconsistent." 40 CFR § 271.4(b). The Plan concludes that, ***to continue to be an authorized State, New York must meet the requirements of these federal regulations, and that the Plan was written to be consistent with these federal mandates***.[2]

The Plan concludes that "a national perspective on the hazardous waste industry is a necessary result of the Supreme Court holdings that solid waste is a commodity and interstate transport cannot be inhibited under the Commerce Clause [citations omitted]." Thus, the Plan looks at the management of hazardous waste generated in New York State from the perspective of present industry practices. In doing so, the Plan takes into account the impact of national hazardous waste management capacity. Unlike the original statutory intent, the Plan recognizes the current realities of the hazardous waste management industry and the Plan's findings, recommendations and guidance reflect a national perspective in determining the hazardous waste management "needs" of New York State. (Intro-7).

C. New York's 1993 CAP

In May 1994, NYSDEC submitted to EPA New York's most recent (1993) capacity assurance plan ("CAP"), a copy of which is attached hereto as Exhibit A. As indicated in the CAP (pp. 1, 7 and 12), EPA's CAP guidance only called for New York to assess "recurrent" wastes generated in the State. "One-time" wastes from remedial actions under CERCLA, RCRA and other programs were not included in New York's CAP. Using the 1991 Baseline data included in New York's CAP, Table 3, p. 13, recurrent wastes generated in New York and landfilled in New York accounted for less than 10% of the volume of wastes actually landfilled in New York (18,360 tons as compared to 197,160 tons).

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[2] *See* also ECL § 27-0911 which provides that the standards applicable to TSDs in New York "shall be consistent with the comparable standards" promulgated by EPA. To be consistent with EPA's comparable standards, New York's RCRA program cannot prohibit the treatment, storage or disposal of hazardous wastes in the State except where there is a threat to human health or environmental protection.

As indicated at pp. 17-18 of the CAP, the determination of New York's Baseline demand does not include one-time wastes (*i.e.*, remedial wastes); it does not include imported wastes; and it does not include industrial, non-hazardous wastes.[3]

Excluding from the CAP analysis more than 90% of the wastes actually land disposed necessarily results in a very substantial under estimate of future demand for land disposal capacity and a very unreliable projection regarding the future availability of needed landfill capacity.

D. The Plan's "Needs" Analysis

Chapter 6 of the Plan contains its in-State facility needs analysis.[4] Since 1985, it has been the State's policy to look to the private sector for the construction and operation of hazardous waste management facilities. (p. 6-1).

The land disposal restriction rules ("LDRs") mandate the best management method for each specific waste type. The LDRs establish specific treatment standards to assure that the land disposal of hazardous waste will pose no significant threat to public health or the environment. Landfilling is not permitted for many wastes. (p. 6-2).

The Plan specifically relies on EPA's 2009 National Capacity Analysis, which relied on EPA's 1996 National Capacity Assessment Report ("1996 Report"). EPA determined that national capacity remains available to handle the waste generated across the nation at least through 2034. (Plan, Appendix E). Based on this EPA determination, federal Superfund monies continue to come into New York and other states for remedial cleanup activities. (Plan, p. 6-3).

The Plan concludes that it is not necessary for NYSDEC to sponsor or initiate the siting of any new facilities. Rather, any siting proposals should originate from the private sector based on their scientific, technical, environmental, regulatory, social and economic considerations. The "Siting Plan embraces the market forces that have served to assure adequate hazardous waste management capacity and does not discourage the consideration of private sector siting proposals that meet the requirements of the ECL and regulations, including the siting criteria in 6 NYCRR 361." (pp. 6-7 to 6-8).

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[3] The CAP, at p. 18, indicates that EPA was expected to develop a separate demand estimate for one-time (remedial) wastes and an assessment of the adequacy of national capacity for such wastes, but the Plan makes no reference to nor reflection of any such assessment by EPA for what constitutes the largest demand for land disposal capacity. In Jan. 1995, EPA published a report entitled "One-time Waste Estimates for Capacity Assurance Planning," EPA530-R-94-002. See Exhibit B attached hereto.

[4] This analysis focuses more specifically on whether there is a need for NYSDEC to sponsor the development of new or expanded facilities in New York.

E. EPA's 2009 Capacity Assurance Analysis

The 2009 EPA assessment states that it is based on the November 1996 Report updated using anecdotal information based on a consideration of the following:

1. Prices for the treatment and disposal of hazardous wastes have remained essentially unchanged, indicating no capacity shortfall.

2. The RCRA Biannual Report information does not show significant changes in the generation or management of hazardous wastes that would be indicative of a shortfall in capacity.

3. Information from RCRA permits indicates no national shortfall in capacity.

4. There is evidence that increased efforts to promote waste minimization, source reduction, and recycling activities have resulted in a reduction in the generation of hazardous wastes.

"This information, combined with the finding of the 1996 National Capacity Assessment Report, indicates that there remains adequate national capacity in all CAP management categories through December 31, 2034. States may refer to this memorandum and the above data sources as a basis for assuring adequate hazardous waste management capacity in their cooperative agreements or SSCs." There is no indication that EPA undertook to update its 1995 one-time waste analysis reported in Exhibit B attached hereto.

The 1996 Report, at p. 14 contains the following:

> EPA recognizes that many States included as available capacity for 2013 facilities that were not in full-scale commercial operation or were operating under interim status in 1993. The inclusion of such facilities in CAPs is not evidence of a commitment on the part of the Agency or the States to bring these facilities on-line or to grant them part B permits. Capacity planning is intended to project into the future based on historical data and current knowledge. Including management facilities not yet fully operational or operating under interim status does not imply a State certification or intention that these facilities will receive their permits or become fully operational but rather is an attempt to evaluate future capacity based on the information representing waste management today….Accordingly, although the Agency believes the information presented in this Report demonstrates the presence of significant treatment and disposal capacity, the Agency will continue to periodically collect and evaluate data to ensure that the requirements of CERCLA 104(c)(9) are satisfied.

The capacity data contained in the tables presented in EPA's 1996 Report were taken directly from each State's CAP. (Exhibit B attached hereto, p. 17). For land disposal capacity,

the 1996 Report contained the following information derived from New York's 1993 CAP Report.

State	**Baseline**	**Commercial Landfill Capacity for Subtitle C Wastes (tons)**		
		1993	**1999**	**2013**
New York	308,750	1,174,770	2,831,010	2,028,900

New York's 1993 CAP (p. 25—Projections) estimated the amount of commercial landfill capacity that is expected to be used for recurrent wastes between the start of 1993 and each of the remaining projection years (1999 and 2013). It made that projection by multiplying the estimated annual recurrent waste demand for commercial hazardous waste landfill capacity in 1993 (Table 5) by the number of years into the future and subtracting this quantity from the land disposal capacity available in 1993 (CAP—Table 6).

CAP Table 5, p. 20, assumes a constant recurrent demand for landfill disposal of 57,290 tons per year or 1,145,800 tons over the 20 year period from 1993 to 2013. That projection assumes no remedial wastes and no imported wastes. Table 6, p. 26, shows projected available landfill capacity in 1993 as 374,770 tons, and a 771,100 ton deficit by the year 2013.

The CWM Model City Facility is the only commercial hazardous waste landfill in the State of New York. CWM's SLF 12 was operating in 1993 with 374,770 tons of remaining capacity. RMU-1 was permitted in late-1993 and constructed in 1994-95.

The projections in EPA's 1996 CAP Report appear to have included 2,800,000 tons as the capacity in RMU-1. By adding 2,800,000 tons to the 771,100 ton deficit projected for 2013 in New York's 1993 CAP, the 1996 EPA projection for 2013 capacity is the 2,028,900 tons reflected in the above table taken from the EPA's 1996 Report.

According to the data tables in the Appendix to EPA's 1995 one-time waste estimate for capacity assurance purposes (Exhibit C attached hereto) for 1993 to 2013, EPA estimated that New York would need 516,719 tons of landfill capacity for one-time wastes. EPA further projected that the national demand for landfill capacity for one-time wastes for 1993 to 2013 would be 5,372,138 tons.

The actual capacity in RMU-1 was 2,800,000 cubic yards which converts to approximately 4,200,000 tons.[5] The 1999 RMU-1 height increase added 695,000 yards of capacity, and the 2009 RMU-1 final cover redesign added 106,900 yards. Thus, the total capacity of RMU-1 is approximately 5,402,850 tons. In 2013, the actual available capacity in RMU-1 was approximately 200,000 tons, not the 2,000,000 tons projected in EPA's 1996 CAP

[5] The conversion factor is 1.5 tons/cu. yd.

projection. Between 1993 and 2013, the landfill capacity in SLF 12 and RMU-1 actually consumed was approximately 5.58 million tons.

Based on a review of its records back to 1995, CWM estimates that 98% of its landfill gate receipts have been bulk wastes, and 81% of the bulk wastes are from one-time remedial actions.

According to EPA's 1995 one-time waste estimate and the 1996 recurrent waste projections, New York's anticipated demand for land disposal of in-State generated wastes for 1993 through 2013 was as follows:

1.	recurrent wastes	1,145,800 tons
2.	one-time wastes	516,719 tons
TOTAL		1,662,519 tons

The actual data for total wastes landfilled in New York between 1993 and 2013 was as follows:

SLF 12	374,770 tons
RMU-1[6]	5,202,850 tons
TOTAL	5,577,620 tons

Assuming that remedial wastes represented 79.4% (.98 x .81) of the total, 4,428,630 tons were one-time remedial bulk wastes, and 1,148,990 tons were in the nature of recurrent wastes. Thus, while the projection for recurrent waste was within 1% of the actual volume, the actual volume of one-time wastes were 8.5 times more than the projection and nearly 82.4% of the total national projection for one-time wastes. The total actual demand for land disposal at Model City for 1993 to 2013 was 3.3 times the estimated total for recurrent and one-time wastes.

This very large under estimate in the demand for the land disposal capacity at the Model City facility is the result of several factors. First, the estimated demand substantially understated the demand for one-time remedial wastes. While it is nearly impossible to accurately project the amount of such demand from one year to the next, the actual data for the period from 1993 through the present demonstrates that one-time remedial wastes represent a significant and ongoing factor in determining the need for future land disposal capacity. Significantly, the 2010 Siting Plan referenced only the projections for recurrent wastes without any estimate for one-time wastes. That oversight significantly undercuts the accuracy and reliability of the Plan's needs analysis.

[6] 200,000 tons of capacity was available at the beginning of 2013.

Second, as recognized in the Plan, the market for hazardous waste treatment and disposal services is regional not State specific. Waste imports and exports are essential components of any accurate demand projections. EPA's 1996 and 2009 CAP projections did not accurately reflect what is happening in the market place.

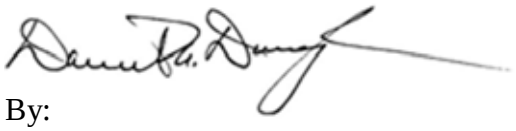
CONCLUSION

CWM respectfully submits that the actual landfill demand and capacity data presented herein demonstrates that there is a need for additional land disposal capacity, and, as indicated in the Plan, NYSDEC is properly relying on the private sector to determine where and when to develop the additional capacity that will be needed to meet the future demand for land disposal capacity.

Moreover, as provided in the Plan, consistency with 40 CFR § 271.4(a) and (b) is required. Therefore, a Siting Certificate should issue unless it is shown that RMU-1 would have a significant adverse effect on public heal or the environment, and no such showing has been made.

Sincerely,

COHEN & GRIGSBY, P.C.



By:
Daniel M. Darragh

DMD:mlv
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cc: David Stever, Esq.

EXHIBIT A

RCRA Box 320

Prepped by Ryan Dugan

Document Number:

94) CAGA-S0125

Docket Number:

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STATE OF NEW YORK
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK 12233-1015

LANGDON MARSH
Acting Commissioner

MAY 23 1994

Ms. Jeanne Fox
Regional Administrator
United State Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

Dear Ms. Fox:

Enclosed is the 1993 New York State Capacity Assurance Plan (CAP) required under Section 104(c)(9) of the Comprehensive Environmental Response and Liability Act, (CERCLA), as amended (42U.S.C. §9604(c)(9). This is our Phase I CAP submittal.

Under this section of CERCLA, the United States Environmental Protection Agency (USEPA) 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 hazardous waste reasonably expected to be generated within their borders for 20 years. This 1993 New York State CAP provides a basis for you to evaluate the assurances of New York State that are required to be contained in a CERCLA contract or cooperative agreement. Those contracts or cooperative agreements will incorporate this document by reference.

The enclosed 1993 New York State Phase I CAP: 1) demonstrates that New York State has described its current hazardous waste management system, including on-going waste minimization program activities; 2) has projected the demand for commercial hazardous waste management capacity from recurrent hazardous wastes generated in New York State for the next 20 years; and 3) has projected the commercial hazardous waste management capacity available within New York State 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 or 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 New York State under 42 U.S.C. §9604(c)(9).

Sincerely,

Langdon Marsh
Acting Commissioner

Enclosure

cc: Capacity Programs Branch OS-321W
United States Environmental Protection Agency
Office of Solid Waste
401 M Street
Washington D.C. 20460

ATT: Phase 1 Capacity Assurance Submittal Enclosed

NEW YORK STATE

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS SUBSTANCES REGULATION

50 WOLF ROAD

ALBANY, NEW YORK 12233-7250

1993 HAZARDOUS WASTE CAPACITY ASSURANCE PLAN FOR NEW YORK STATE PHASE 1

APRIL 30, 1994

Langdon Marsh
Acting Commissioner

Norman H. Nosenchuck, P.E.
Director

Introduction

This is the New York State 1993 Capacity Assurance Plan (CAP) for hazardous waste management. This Plan has been prepared according to the instructions provided by the United States Environmental Protection Agency (USEPA) in its publication "Guidance For Capacity Assurance Planning: Capacity Planning Pursuant to CERCLA §104(c)(9)." dated May, 1993. Biennial Report data received in 1991 from large quantity generators and from Treatment, Storage and Disposal facilities were used as the basic data source. Confidential Business Information (CBI) data not available for this report, has been sent to Margaret Lee, United States Environmental Protection Agency CBI Officer, Washington, D.C. pursuant to instructions contained in the March, 1994 document "Questions and Answers - Capacity Assurance Planning (Pursuant to 1993 Guidance Document For Capacity Assurance Planning." The data was edited by the basic, and advanced edits provided through the USEPA Biennial Report Software. Numerical data was verified by cross reference and comparison with the New York State Hazardous Waste Manifest database. New York State believes that this Capacity Assurance Plan adequately addresses all of the requirements in the USEPA guidance.

New York State has been among the leading states in developing a long-term plan for assessing hazardous waste management capacity needs and ensuring the availability of needed hazardous waste management capacity. As a example, the State's Hazardous Waste Facility Siting Plan represents a major planning effort. Data used to develop the Siting Plan will be compared to the CAP data and the State Siting Plan will be updated to address future hazardous waste management capacity needs.

New York State believes that this 1993 CAP demonstrates a thorough understanding of the Hazardous Waste Management system in New York State and provides the USEPA with an adequate assurance of capacity.

BASEYEAR DATA

The following is a discussion of the features common to all CAP tables: (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 hazardous waste management capacity from recurrent and one-time waste in 1991.

CAP Management Categories

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.

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 following Biennial Report Forms: Waste Generation and Management (GM), Waste Received From Off Site (WR), and Waste Treatment, Disposal, or Recycling Process Systems (PS). Exhibit 2-1 presents Biennial Report System Type codes and the CAP Management Categories to which it was assigned.

Two Biennial Report System Type codes are not assigned to a CAP Management Category: 1) M135 Direct discharge to sewer/POTW (no prior treatment); and 2) 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. These System Type codes are reassigned to more appropriate CAP Management Categories based on waste management reported by the receiving facility or the physical form of the waste and knowledge of waste management systems available at the receiving facility.

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.

Exhibit 2-1
CAP Management Category/Assignment

RECOVERY

Metals Recovery

M011*	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

* 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

Transfer Facilities

Hazardous Waste Transfer facilities typically receive hazardous 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 of baseyear demand data can occur when wastes that are reported on the GM forms of both generators and transfer facilities are included in the baseyear and projection tables.
- Waste imported to in-state transfer facilities may be erroneously included as waste generated in state when quantities reported on the GM forms of in-state transfer facilities are included in the total of waste generated and managed in state. Consequently, demand for management of wastes generated in state would be overestimated.
- Waste imported to in-state transfer facilities or exported to out-of-state transfer facilities may be aggregated with in-state generated waste and sent to one or more waste management facilities; consequently, it is difficult to distinguish final management of imports or exports from final management of waste generated by other states.
- Waste shipped by transfer facilities may include waste from small quantity generators (SQGs) and/or wastes shipped during a previous reporting cycle, consequently a state may over estimate their baseyear demand.

To address these problems, New York State employed the following USEPA CAP guidelines:

- Disregard all waste quantities shipped by transfer facilities. These quantities of waste are accounted for by the reallocation of wastes shipped from generators to transfer facilities.
- For in-state generated waste, reallocate waste quantities shipped from generators to transfer facilities to appropriate in-state CAP Management Categories. If a transfer facility exports wastes for management out-of-state, these waste quantities are reported as exports, rather than reallocated to in-state CAP Management Categories.
- Reallocate waste quantities imported from other states to transfer facilities in New York to appropriate import CAP Management Categories. Waste quantities that are imported by New York transfer facilities and subsequently exported for management in another state are reported separately as imports transferred out-of-state.
- Report exports to transfer facilities located in other states in the baseyear tables. Reallocate these quantities to the appropriate CAP Management Categories for projecting future demand on capacity.

Quantities shipped to transfer facilities have been reallocated based on the distribution of CAP Management Categories to which each transfer facility shipped waste. The proportion of waste sent to each CAP Management Category is calculated by dividing the total waste shipped to each CAP Management Category by the total shipped by the transfer facility. Proportions are calculated for all transfer facilities and shipments received by each transfer facility are reallocated based on the associated proportions.

The advantage of this approach is that it does not require reallocation on a shipment-by-shipment level. Although, this option is sometimes inaccurate in terms of determining the technology that actually managed each shipment, this option will likely determine the appropriate CAP Management Category, due to the broad definitions of CAP Management Categories.

International Exports

USEPA CAP Guidance indicates that 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 must include estimates for international exports in their CAP tables. International exports are presented in the same way as interstate exports for the baseyear and for estimating demand on commercial capacity in the projection years. 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 of hazardous waste exports which are maintained by the Office of Waste Programs Enforcement (OWPE) according to 40 CFR 262.53. New York State obtained these reports from USEPA and used these reports to verify the completeness of the 1991 New York Biennial Report Database.

Mixed Hazardous/Radioactive Wastes

As discussed in the USEPA Guidance For Capacity Assurance Planning, adequate capacity does not currently exist for the treatment and disposal of mixed hazardous/radioactive wastes due to the technical difficulties involved in its treatment and the concerns about human exposure to radiation. Therefore, these wastes are not included in the baseyear or projection years. Mixed hazardous/radioactive wastes are identified in the 1991 Biennial Report on Form GM, Section I, Box I.

Demand on Capacity from Recurrent and One-time Waste

USEPA requires that states distinguish between recurrent and one-time wastes for those wastes generated within their borders that place demand on commercial management capacity in the baseyear. This distinction is necessary because projections include demand on commercial capacity from only recurrent wastes; USEPA has estimated the future demand on commercial capacity from one-time wastes. The baseyear demand for on-site and captive management capacity does not distinguish between recurrent and one-time wastes.

The Form GM Origin code was used to identify whether waste are recurrent or one-time. Wastes with the following GM Form Codes or Sources were also identified as onetime wastes.

FORM CODES

B002 Lab packs of debris only
B301 Soil contaminated with organics
B302 Ash, slag, or other residue from incineration of wastes
B307 Metal scale, filings, or scrap
B308 Empty or crushed metal drums or containers
B310 Spent solid filters or adsorbents
B311 Asbestos solids and debris
B406 Empty fiber or plastic containers

SOURCE CODES

A61 Superfund Remedial Action
A62 Superfund Emergency Response
A63 RCRA Corrective Action at solid waste management unit
A64 RCRA closure of hazardous waste management unit
A65 Underground storage tank cleanup
A69 (Other remediation)
A93 Closure of management unit(s) or equipment other than by remediation specified in codes A61 - A69

BASEYEAR TABLES

As a component of its CAP, each state is required to demonstrate an understanding of its current RCRA Subtitle C hazardous waste generation and management system by providing information on the quantity of RCRA Subtitle C hazardous waste exported, imported, and generated and managed in state. States are required to report on RCRA Subtitle C hazardous waste, and non-RCRA Subtitle C hazardous waste that is considered hazardous under state regulations and is managed in hazardous waste management systems. Four CAP baseyear tables present this information.

- 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.

Table 1. 1991 Hazardous Waste Generated and Managed On Site

Table 1 presents demand for on-site management of hazardous waste in New York State by CAP Management Category. This table shows how much waste is managed in systems on site and not available for captive or commercial use. Wastes that are generated and managed on site in commercial systems (treatment residuals), are included in Tables 2 and 3.

According to the CAP Guidance, states are not required to demonstrate adequate capacity for hazardous wastes that are managed in on-site systems. It is assumed that the capacity needed to manage hazardous wastes on site will continue to be available in future years unless significant events that will reduce this capacity can be identified. No specific events that will cause significant shifts from on-site to commercial management in New York State have been identified.

Table 1

New York State
1991 Hazardous Waste Generated and Managed On Site (tons)

CAP Management Category	Waste Managed On Site
RECOVERY	
Metals Recovery	21,840
Inorganics Recovery	3,800
Organics Recovery	4,210
Energy Recovery - Liquids	14,940
Energy Recovery - Sludges/Solids	30
TREATMENT	
Stabilization/Chemical Fixation	0
Incineration - Liquids and Gases	70,520
Incineration - Sludges/Solids	1,830
Fuel Blending	0
Hazardous Wastewaters and Sludges Treatment	50,496,060
DISPOSAL	
Landfill	0
Deepwell/Underground Injection	0
Land Treatment/Farming	0
TRANSFER/STORAGE	
Transfer/Storage	0

Table 2. 1991 Management of Hazardous Waste in Captive Systems

Table 2 presents the demand placed on captive management systems in 1991, divided into 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 captive system(s). Demand on captive capacity from recurrent and one-time wastes is presented on Table 2, because states are not required to assure capacity for wastes managed in captive systems.

Table 2 does not include the demand placed on limited commercial capacity; this demand is included in Table 3. Mixed hazardous/radioactive wastes and wastes quantities shipped by transfer facilities are not included in Table 2.

Table 2

New York State
1991 Management of Hazardous Waste in Captive Systems (tons)

CAP Management Category	Exports	Waste Generated and Managed in State	Imports
RECOVERY			
Metals Recovery	170	80	210
Inorganics Recovery	0	0	0
Organics Recovery	70	10	1,160
Energy Recovery - Liquids	0	0	0
Energy Recovery - Sludges/Solids	0	0	0
TREATMENT			
Stabilization/Chemical Fixation	0	0	0
Incineration - Liquids and Gases	560	560	2,260
Incineration - Sludges/Solids	40	40	170
Fuel Blending	120	0	0
Hazardous Wastewaters and Sludges Treatment	230	362,090	31,580
DISPOSAL			
Landfill	720	0	0
Deepwell/Underground Injection	0	0	0
Land Treatment/Farming	0	0	0
TRANSFER/STORAGE			
Transfer/Storage	100	780*	0

* Waste transferred to commercial systems (Table 3); Long Term Storage

Table 3. 1991 Management of Hazardous Waste in Commercial Systems

Table 3 presents 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).

Table 3 distinguishes between recurrent versus one-time waste for waste generated and managed within New York State and exports that placed demand on commercial capacity in 1991 due to the requirement to project demand on commercial capacity from recurrent waste only. Table 3 does not distinguish between recurrent and one-time waste for imports because states do not assure capacity for wastes imported from primary generators.

Residuals from the treatment of imported wastes and the treatment of wastes generated and managed in-state are reported as either recurrent or one-time New York State generated wastes. Secondary treatment residuals that are generated and managed on-site in commercial systems are reported as recurrent waste generated and managed in-state.

Waste quantities generated in New York State and transhipped to in-state management facilities are reallocated to the appropriate in-state CAP management categories. Shipments of wastes to out-of-state management facilities through transfer facilities located in New York State are reallocated to the exports CAP Management categories. Waste quantities that are imported by in-state transfer facilities and subsequently exported for management in another state are reported separately as imports transferred out-of-state.

Apparent transfer coefficients to CAP management categories for New York facilities which transfer wastes received from any off-site sources are presented in the APPENDIX.

Table 3

New York State
1991 Management of Hazardous Waste in Commercial Systems (tons)

CAP Management Category	Exports		Waste Generated and Managed In State		Imports*
	Recurrent	One-time	Recurrent	One-time	
RECOVERY					
Metals Recovery	18,980	260	1,340	620	300
Inorganics Recovery	230	2,140	220	80	0
Organics Recovery	11,090	1,000	1,680	70	400
Energy Recovery - Liquids	5,150	700	740	20	9,630
Energy Recovery - Sludges/Solids	470	120	0	0	0
TREATMENT					
Stabilization/Chemical Fixation	21,210	3,250	5,490	150	77,540
Incineration - Liquids and Gases	7,730	1,180	180	40	0
Incineration - Sludges/Solids	3,030	3,280	120	40	20
Fuel Blending	15,430	1,220	2,290	470	3,540
Hazardous Wastewaters and Sludges Treatment	27,780	21,590	84,090	3,260	15,540
DISPOSAL					
Landfill	10,820	11,750	18,360	43,600	135,200
Deepwell/Underground Injection	1,990	30	0	0	0
Land Treatment/ Farming	0	10	0	0	0
TRANSFER/STORAGE					
Transfer/Storage	4,320	1,270	0	0	0

*Imports cannot be divided into recurrent and one-time wastes due to limitations of information provided on Biennial Report WR forms. 7750 tons of waste imported to New York State transfer facilities was subsequently exported to out-of-state management facilities.

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

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 from PS forms in 1991 Biennial Reports. Table 4a displays maximum operational in-state RCRA Subtitle C capacity by facility location and CAP Management Category.

Table 4

New York State
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	27,220
Inorganics Recovery	0
Organics Recovery	1,900
Energy Recovery - Liquids	37,480
Energy Recovery - Sludges/Solids	0
TREATMENT	
Stabilization/Chemical Fixation	125,800
Incineration - Liquids and Gases	40
Incineration - Sludges/Solids	720
Fuel Blending	9,920
Hazardous Wastewaters and Sludges Treatment	778,650
DISPOSAL	
Landfill	308,750
Deepwell/Underground Injection	0
Land Treatment/Farming	0
TRANSFER/STORAGE	
Transfer/Storage	0

Table 4a - Maximum Operational In-State Commercial Subtitle C Management Capacity - End of 1991 (tons/year)

NAME	EPA ID	CAP MANAGEMENT CATEGORIES								
		RECOVERY			THERMAL		TREATMENT			DISPOSAL
		Metals Recovery	Organics Recovery	Energy Recovery Liquids	Incineration Liquids	Incineration Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill [1]
CHEMICAL MANAGEMENT, INC.	NYD000691949							9,926	733	
LEA RONAL INC	NYD001325661	3,628				300				
WEKSLER INSTRUMENTS	NYD005920194		1							
PRIDE SOLVENTS & CHEMICAL	NYD057722258		760							
PHOTOCIRCUITS CORPORATION	NYD096920483							183		
KBF POLLUTION	NYD981182769	23,380						1,169		
BERKMAN BROS	NYD001236017							880		
AT&T NASSAU	NYD086225596					20				
CERAMASEAL	NYD002066173		14							
ASHLAND CHEM	NYD046877775							6		
MERCURY REFINING	NYD048148175	216								
NORLITE CORPORATION	NYD080469935			37,479						
SOLVENTS & PET	NYD013277454		705							
NORTHEAST ENVIRONMENTAL	NYD057770109						2,801	3,380		
STATE UNIVERSITY OF NY	NYD071600100	1								
SCI SYSTEMS INC.	NYD982271793		384							
BDT INC	NYD000632372		35		38	400		2,000		
FRONTIER CHEMICAL	NYD043815703						5,866	5,585		
CWM CHEMICAL SERVICES, INC.	NYD049836679						1,250	535	125,068	308,750
CECOS INTERNATIONAL INC	NYD080336241							755,004		
Statewide Management Capacities		27,230	1,900	37,480	40	720	9,920	778,660	125,800	308,750

1 - Tons Remaining

04/12/94

PHASE 1: PROJECTIONS

PHASE 1 PROJECTIONS

Introduction

This chapter describes the methods used to project New York State's future need for commercial hazardous waste recovery, treatment, and disposal capacity. The 1993 CAP projections focus only on commercial capacity because it is generally expected that on-site and captive capacity will grow as needed to meet the demand for such capacity. Projections include the impact of USEPA regulations that are finalized before the end of the 1992 calendar year, but do not adjust hazardous waste projections for the impacts of economic change.

Baseline

Tables 1-4 present the previous chapter baseyear data that describes hazardous waste management systems in 1991. This baseyear information is used to produce the baseline recurrent demand and capacity data from which projections were made.

Baseline Demand

According to the CAP Guidance document, Baseline demand includes the following types of waste:

- Primary RCRA Subtitle C hazardous waste generated in state in the baseyear;
- Primary Non-RCRA Subtitle C hazardous waste that is considered hazardous under state regulations and is managed in hazardous waste management systems; and
- Treatment residuals generated from management of primary hazardous waste in the baseyear. EPA has assigned 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 are responsible for the residuals; and

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

Baseline demand does not include the following types of waste:

- One-time wastes, as EPA has developed one-time waste estimates by state 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.

The baseline recurrent demand for commercial Subtitle C hazardous waste management capacity was estimated by aggregating 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.

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

Treatment residuals from wastes imported for management by stabilization or incineration require the following adjustments to the base line data:

1) Subtracting the demand on landfill capacity from baseyear data for all treatment residuals from stabilization/chemical fixation, incineration -liquids and gases, and incineration - sludges/sludges management categories.

2) Adjusting the demand for land disposal capacity for residuals from stabilization or incineration of any wastes generated in New York with the following USEPA multipliers:

   - 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.

Reccurrent baseline demand for Subtitle C hazardous waste management capacity was adjusted to exclude two large wastestreams:

Olin Corporation (NYD002123461) reported a onetime private remediation of 5700 tons (GM Page 9, lo_pg_num - 2).

Exans Chemet (NYD002234763) reported approximately 1500 tons of waste subsequently reported as non-hazardous (GM page 7, lo_pg_num - 1).

Both wastestreams were removed from the Baseline.

The baseline recurrent demand for Subtitle C hazardous waste management capacity was further adjusted by excluding the baseyear demand on commercial waste management capacity of two closed facilities:

- Frontier Waste Management (NYD043815703)
- Republic Environmental (NYD000691949)

Typically, waste quantities generated by these facilities are residuals from the treatment of hazardous wastes. Based on the treatment performance indicated by GM and PS forms for these facilities, the following rates of residual generation from waste treatment were estimated:

	New York	Out-of-State
Hazardous Wastewater and Sludges Treatment -	2950 tons	3340 tons
Fuel Blending -	5500 tons	2910 tons

As indicated by Table 6, New York has adequate capacity for management of wastes requiring Hazardous Wastewaters and Sludges Treatment. However, additional quantities of wastes requiring Fuel Blending capacity would be exported under the scenario proferred by the USEPA CAP Guidance. Since the residuals are the responsibility of the importing state, only additional Wastewater and Sludges Management capacity has been added to the baseline.

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	18,310	18,560	18,560	18,560
Inorganics Recovery	460	460	460	460
Organics Recovery	12,750	12,720	12,720	12,720
Energy Recovery - Liquids	3,680	3,990	3,990	3,990
Energy Recovery - Sludges/Solids	390	340	340	340
TREATMENT				
Stabilization/Chemical Fixation	24,210	24,240	24,240	24,240
Incineration - Liquids and Gases	7,910	8,020	8,020	8,020
Incineration - Sludges/Solids	3,150	3,320	3,320	3,320
Fuel Blending	13,960	13,860	13,860	13,860
Hazardous Wastewaters and Sludges Treatment	118,060	119,960	119,960	119,960
DISPOSAL				
Landfill	57,010	57,290	57,290	57,290
Deepwell/Underground Injection	480	440	440	440
Land Treatment/Farming	0	0	0	0
TRANSFER/STORAGE				
Transfer/Storage	4,480	*1,550	1,550	1,550

* Transfers to US and Canadian Transfer Facilities

Projections

1993 Demand

Demand estimates for 1993 are required since that is when states make the assurance of availability of capacity for 20 years from the date that these assurances are made. The impacts of Phase I LDRs (57 *Federal Register* 37194, August 18, 1992) and expired LDR capacity variances for certain wastes are included in the CAP analysis since their impact is not reflected in the 1991 Biennial Report data because they became effective after the start of 1991. These regulations may affect changes in RCRA Subtitle C hazardous waste management and residuals generation, as they require treatment of waste previously sent directly to landfills. Wastecodes newly listed in 1991, (EPA Hazardous Waste Codes F037, and F038) require a quantitive adjustment to accurately represent a future annual generation rate.

Demand for commercial waste management capacity from recurrent hazardous waste expected to be generated within New York State borders in 1993, was determined as follows:

- Baseline exports to transfer/storage facilities were reallocated to the appropriate CAP Management Categories based on the percentage distribution of CAP Management Categories to which each out-of-state transfer facility shipped wastes. (Table ?)

- Wastes that are affected by regulatory changes were separated from wastes that are not affected by regulatory changes by compiling 1991 Biennial Report data by EPA Hazardous Waste code. No newly listed waste quantities (i.e., EPA Hazardous Waste codes F037 and F038) requiring a quantitive adjustment were identified in New York's data.

- Wastestream records containing waste codes affected by regulatory changes were further screened by relevant physical form indicators and disposal methods to identify wastes potentially affected by land disposal restrictions (Exhibit 3-1). The generators of over 90% of the wastes identified were contacted by phone to verify the regulatory status of each of the impacted wastestreams. Demands for alternate management capacity cited by these generators replaced the land disposal demand indicated by baseline management practices. For the remaining wastestreams identified by the Land Disposal Restriction Assessment, the Best Demonstrated Available Technologies indicated on Exhibit 3-1 were substituted for continual land based management of these wastes. As described earlier, the quantities of primary and in-state generated treatment residuals affected by LDR requirements were multiplied 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.

Exhibit 3-1
Wastes with Expired Nat al 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[a]	Arsenic nonwastewater	Concentration-based	Vitrification (stabilization/chemical fixation)	55 FR 22520
D007[a]	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[a]	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[a]	Salts from MSMA and cacodylic acid production	Concentration-based	Vitrification (stabilization/chemical fixation)	55 FR 22520
K084[a]	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.

SOURCE: "GUIDANCE FOR CAPACITY ASSURANCE PLANNING: CAPACITY PLANNING PURSUANT TO CERCLA §104(c)(9)" - 5/93

Table 3-22
Recurrent Wastes Impacted by Federal Land
Disposal Restrictions Variance Expirations

USEPA Hazardous Waste Code	Quantity (tons)
D002	2,500
D003	1,550
D004	40
D007	5,140
D009	5,960
F007	50
F037	0
F038	0
F039	1,260
K009	0
K011 - Wastewater	0
K011 - Nonwastewater	0
K013 - Wastewater	0
K013 - Nonwastewater	0
K013	0
K014	0
K016	0
K031	0
K084	0
K118	0
Total	16,500

Table 3-22b
Shift in Demand for Commercial Hazardous Waste Management Capacity from the Expiration of National Variances for Land Disposal Restrictions (tons)

CAP Management Category	Quantity (tons)
Metals Recovery	239
Inorganics Recovery	0
Organics Recovery	0
Energy Recovery - Liquids	0
Energy Recovery - Sludges/Solids	0
Stabilization/Chemical Fixation	57
Incineration - Liquids and Gases	44
Incineration - Sludges/Solids	119
Fuel Blending	0
Hazardous Wastewaters and Sludges Treatment	1826
Landfill	-480
Deepwell/Underground Injection	-24
Transfer/Storage	-1694

1993 - 2013 Demand

New York State assumed that demand for commercial RCRA Subtitle C hazardous waste management capacity from hazardous waste expected to be generated within the State is constant from 1993 to 2013.

Baseline Capacity

Baseline commercial capacity is the existing 1993 operational capacity located within New York State. The baseyear renewable capacity figures from Table 4, less the waste management capacities from two facilities (i.e. Frontier, Republic Environmental) closed since 1991, are reflected in the Baseline column of Table 6. The quantity of nonrenewable land disposal capacity available in 1993 was obtained from the Form PS of the 1992 New York State Annual Reports submitted in 1993.

Projections

For all CAP Management Categories except commercial landfill capacity, New York State assumed that capacity available in 1993 is available to the year 2013. Consequently, the "Maximum In-State Commercial Subtitle C Management Capacities" for the years indicated on Table 6 reflect the difference between the Baseline column of Table 6 and the relevant "Demand for Commercial Subtitle C Management Capacity" of Table 5.

The estimated amounts of commercial landfill capacity that is expected to be used between the start of 1993 and each of the remaining projection years (1999 and 2013) is calculated by multiplying the demand for commercial landfill capacity in 1993 (Table 5) by the number of years and subtracting this quantity from the Land Disposal Capacity remaining in 1993 (Table 6).

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	27,220	8,660	8,660	8,660
Inorganics Recovery	0	-460	-460	-460
Organics Recovery	1,900	-10,820	-10,820	-10,820
Energy Recovery - Liquids	37,480	33,490	33,490	33,490
Energy Recovery - Sludges/Solids	0	-340	-340	-340
TREATMENT				
Stabilization/Chemical Fixation	125,070	100,830	100,803	100,830
Incineration - Liquids and Gases	40	-7,980	-7,980	-7,980
Incineration - Sludges/Solids	720	-2,600	-2,600	-2,600
Fuel Blending	4,050	-9,810	-9,810	- 9,810
Hazardous Wastewaters and Sludges Treatment	755,970	642,300	642,300	642,300
DISPOSAL				
Landfill	308,750	374,770	31,010	-771,100
Deepwell/Underground Injection	0	-440	-440	-440
Land Treatment/Farming	0	0	0	0
TRANSFER/STORAGE				
Transfer/Storage	0	*1,550	1,550	1,550

- Indicates Capacity Shortfall
* Transfers to a Canadian Transfer Facility

STATE WASTE MINIMIZATION ACTIVITIES

Overview of Waste Minimization Activities

New York State feels that a waste minimization program is a key step toward sound hazardous waste management, and that states should vigorously pursue waste minimization as a central component when addressing waste management.

New York State's top hazardous waste priority is waste reduction. The New York State Department of Environmental Conservation (NYSDEC) has developed a program to implement ECL 27-0908 and 27-0105. This program requires companies to reduce their hazardous waste generation, with a goal of 20% reduction over the next five(5) years. The Department is adopting a multi-faceted approach to waste reduction. This requires all industries to develop and use programs to reduce the use of toxic substances and the generation of hazardous waste and to submit to NYSDEC a Hazardous Waste Reduction Plan (HWRP) discussing their goals and objectives. HWRP are required to be submitted by all TSDFs and all generators of 50 tones or more in calendar years 1993 and 1994, and 25 tons or more for calendar 1995 or later. The written plans are due to NYSDEC by July 1st of the following calendar year. Also, a coordinated effort among NYSDEC's Air, Water and Hazardous Substances programs will ultimately result in reducing the amount of toxic substances and hazardous wastes generated and disposed of.

In developing the State Siting Plan, New York has devoted significant resources in deciding the potential for waste reduction activities to reduce the demand for new management capacity. In this connection, New York has implemented a comprehensive hazardous waste reduction program. The State Siting Plan has formally incorporated a five(5%)percent annual reduction target for the period 1994-1998; four (4%) percent for 1999-2003; three(3%)percent for 2004-2008 and two(2%)percent for 2009-2013. These targets are applied to all waste streams and industry groups, and form New York's so-called "5-4-3-2" waste reduction plan.

To achieve these objectives, New York provides a substantial budget in combined Federal and State funds. These funds are used to provide a full range of waste reduction services to all sizes of generators in all types of industries. New York is also working to ensure communication and obtain reactions from industry so that the effectiveness of the programs and the validity of the goals can be measured.

Multimedia Waste Reduction

A focal point of New York's current waste minimization activities is its multimedia waste reduction program. The NYSDEC has received a USEPA Pollution Prevention Incentives to States Grant to expand its technical assistance activities to all environmental media. The major elements of this program are:

1. To pilot multimedia, pollution prevention programs for small business. This will expand the State's small business stationary source technical and environmental compliance assistance program that was established by section 507 of the Clean Air Act Amendments.

2. To continue and expand the Department's multimedia pollution prevention technical assistance and outreach programs.

3. To pilot a solid waste reduction effort aimed at solid waste generated at grocery stores.

New York recognizes that to achieve maximum compliance with the hierarchy of preferred management practices, reduction of hazardous waste generation must be accorded the highest priority. The NYSDEC is developing multimedia waste regulations as part of its program of carrying out the preferred management practices hierarchy. The schedule calls for completing the multimedia waste reduction regulations by the Spring of 1994. These regulations will require hazardous waste generators and toxic substance emitters to submit Toxic Chemical Reduction Plans(TCRP). These plans will contain industries' program for reducing generation of hazardous waste and toxic substances across all media, and will be subject to NYSDEC approval.

In summary, New York believes that its waste reduction program is ambitious, but achievable, in view of the very important task and the resources available.

APPENDIX

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 factor

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.) (see page x)
☐ 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.

USEPA Hazardous Waste Code	Quantity (tons)
D002	2,500
D003	1,550
D004	40
D007	5,140
D009	5,960
F007	50
F037	0
F038	0
F039	1,260
K009	0
K011 - Wastewater	0
K011 - Nonwastewater	0
K013 - Wastewater	0
K013 - Nonwastewater	0
K013	0
K014	0
K016	0
K031	0
K084	0
K118	0
Total	16,500

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	239
Inorganics Recovery	0
Organics Recovery	0
Energy Recovery - Liquids	0
Energy Recovery - Sludges/Solids	0
Stabilization/Chemical Fixation	57
Incineration - Liquids and Gases	44
Incineration - Sludges/Solids	119
Fuel Blending	0
Hazardous Wastewaters and Sludges Treatment	1826
Landfill	-480
Deepwell/Underground Injection	-24
Transfer/Storage	-1694

Distribution of CAP Management Categories Utilized By New York Transfer Facilities In 1991

NAME	EPA ID	CAP MANAGEMENT CATEGORIES											
		RECOVERY					THERMAL		TREATMENT			DISPOSAL	
		Metals Recovery	Organics Recovery	InOrganics Recovery	Energy Recovery Solids	Energy Recovery Liquids	Incineration Liquids	Incineration Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill	Deepwell
SOUTH SENECA JR-SR HIGH	NYD000332825							100.0					
UNIVERSITY OF ROCHESTER	NYD000631994								25.8	0.1			
CHEMICAL MANAGEMENT, INC.	NYD000691949	6.3	15.4				0.1	1.4	2.8	71.5	0.6	0.1	
CENTRAL HUDSON GAS & ELECTIC	NYD000705905									85.3			
SAFETY-KLEEN	NYD000708164		4.4										
SAFETY-KLEEN	NYD000708172		98.3						1.2				
SAFETY-KLEEN	NYD000708198		84.3										
SAFETY-KLEEN	NYD000708206		100.0										
ROCHESTER G & E CORP.-	NYD000818781	19.3					73.0	7.7					
SAFETY-KLEEN	NYD000824581		97.2										
AUROMET CORP	NYD001234087												
ADEMCO	NYD001530138	100.0											
GRUMMAN AEROSPACE	NYD002047957		7.8				26.5		63.1				
DECORA MANUFACTURING	NYD002087932		100.0										
SCHENECTADY CHEMICALS, INC.	NYD002070118								100.0				
MAGTROL INC.	NYD002111920												
COOPER POWER	NYD002123651						100.0						
INDUST CERAMICS INC	NYD002210714		11.7	10.2						78.1			
GOULD PUMPS INC	NYD002227304						94.7				5.3		
YONKERS CONT	NYD006995652												
SHOREWOOD	NYD010026391									100.0			
FRONTIER CHEMICAL	NYD043815703		0.2			1.8	0.6	0.4		68.5	27.7	0.2	1.1
BECTON DICKINSON ACUTECARE	NYD045644531							100.0					
N D L ORGANIZATION	NYD045662921								100.0				
RADIAC RESEARCH CORP	NYD049178296				3.6		0.7	8.1	62.6	24.3		0.6	
ASHLAND CHEMICAL INC	NYD049253719		31.3				0.9	2.1	43.6	8.5	6.2	0.5	
CWM CHEMICAL SERVICES, INC.	NYD049836879	0.2	7.2	0.2		14.6	49.6	0.7		11.7		1.9	8.6

Distribution of CAP Management Categories Utilized By New York Transfer Facilities In 1991

NAME	EPA ID	CAP MANAGEMENT CATEGORIES											
		RECOVERY					THERMAL		TREATMENT			DISPOSAL	
		Metals Recovery	Organics Recovery	InOrganics Recovery	Energy Recovery Solids	Energy Recovery Liquids	Incineration Liquids	Incineration Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill	Deepwell
NORTHEAST ENVIRONMENTAL	NYD057770109	1.7	43.5				0.2	0.3	5.1	10.7	33.1	5.7	
ENTENMANNS	NYD081966750									100.0			
GE COMPANY	NYD087539940	11.9					30.6					57.5	
MATCO TOOLS	NYD088886621									100.0			
FIAT PRODUCTS	NYD072377575						100.0						
KEAMOTOR CAR CORP	NYD075432229												
CHEM WST DSP	NYD077444263	2.2					8.1	7.1	51.9	14.3		36	
INTERNATIONAL BUSINESS	NYD080480734	0.6					3.3	34.1	1.0	0.1		60.2	
CHEMICAL POLLUTION CONTROL	NYD082785429		0.9		21.7		0.8	0.4	14.6	1.8	18.3	32.1	8.8
AT&T NASSAU	NYD086225596	100.0											
GENERAL ELECTRIC	NYD093256063		77.1										
SENECA FOODS CORPORATION	NYD094411139												
INDUSTRIAL OILTANK SERVICE	NYD095577342					27.0				73.0			
GENPAK CORPORATION	NYD096191192												
HEVI-DUTY ELECTRIC	NYD980641890						0.1			99.9			
SAFETY-KLEEN	NYD980753784		98.4										
DELAWARE COUNTY ELECTRIC	NYD980756019												
SAFETY-KLEEN	NYD980785760		100.0										
S L AUBURN	NYD981133317		64.3										
NATIONAL FUEL GAS-NASHVILLE	NYD981177306									100.0			
NATIONAL FUEL GAS PORTERVILLE	NYD981177314									100.0			
NATION FUEL GAS ZOAR STA	NYD981177330									100.0			
STATE UNIV OF NY AT	NYD981485758												
BOCES-CATTARAUGUS ALLEGANY	NYD981555337												
SAFETY-KLEEN	NYD981556541		81.6										
M & G CONVOY	NYD981559222		100.0										
SAFETY KLEEN	NYD986872689		67.4										

Distribution of CAP Management Categories Utilized By New York Transfer Facilities In 1991

NAME	EPA ID	CAP MANAGEMENT CATEGORIES											
		RECOVERY					THERMAL		TREATMENT			DISPOSAL	
		Metals Recovery	Organics Recovery	InOrganics Recovery	Energy Recovery Solids	Energy Recovery Liquids	Incineration Liquids	Incineration Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill	Deepwell
NYSDOT	NYD986886539												
NYSDOT	NYD986886729									100.0			
NORTHERN FERTILIZER CHEMICAL	NYD986887638												
R L CALLAHAN INC	NYD986926780												
STANTON AG SERVICE INC	NYD986928471						100.0						
U R SAULPAUGH & SONS	NYD986928935												
BIKETT MILLS	NYD986929149												
CACCAMO CIBRO	NYD986930501												
WILTSIE CONSTRUCTION	NYD986934081												
NATIONAL FUEL GAS	NYD986937092									100.0			
LAVOY GAS STATION	NYD986937803						100.0						
CB STRAIN	NYD986952331									100.0			
KOLAR MACHIN	NYD986960367								100.0				
AEROSOURCE INC	NYD986963932								100.0				

Distribution of CAP Management Categories Utilized By Out of State Transfer Facilities In 1991

NAME	EPA ID	CAP MANAGEMENT CATEGORIES											
		RECOVERY					THERMAL		TREATMENT			DISPOSAL	
		Metals Recovery	Organics Recovery	InOrganics Recovery	Energy Recovery Solids	Energy Recovery Liquids	Incineration Liquids	Incineration Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill	Deepwell
CHEMICAL WASTE MANAGEMENT	ALD000622464									100.0			
PRATT & WHITNEY AIRCRAFT	CTD990872081									35.4	64.6		
LAIDLAW ENVIRONMENTAL	FLD981474802							87.8		12.2			
MKC ENTERPRISES INC	GAD000818367	99.5						0.5					
M & J SOLVENTS CO., INC.	GAD045821170				100.0								
CHEMICAL CONSERVATION OF	GAD093380814						100.0						
OHM RESOURCE RECOVERY INC	GAD096829282	100.0											
LAIDLAW ENVIRTL SER OF ILLINOI	ILD980502744									100.0			
LAIDLAW ENV SYSTEMS (NORTH	MAD000804447					100.0							
GENERAL CHEMICAL CORP	MAD019371079								100.0				
GEOCHEM, INC. DBA JET-LINE	MAD047075734										100.0		
CLEAN HARBORS OF BRAINTREE	MAD053452937					0.3		0.7				52.1	
CLEAN HARBORS OF NATICK, INC	MAD980523203					100.0							
LAIDLAW ENVIRONMENTAL	MDD980554853									42.1		57.9	
CLEAN HARBORS OF BALTIMORE	MDD980555169					2.1	0.3	2.1		42.5	0.1	42.8	8.0
LAIDLAW ENVIRONMENTAL	NCD000648451	0.9					0.4	65.3		33.4			
ECOFLO INCORPORATED	NCD980842132									100.0			
SAFETY-KLEEN CORP.	NJD000768101		99.1						0.3				
CHEMICAL WASTE MANAGEMENT	NJD089216790									100.0			
ADVANCED ENVIRONMENTAL	NJD980536593						25.4	3.4	3.0	9.1	8.5	26.5	
BETHLEHEM APPARATUS CO. INC	PAD002390961											100.0	
DELAWARE CONTAINER CO., INC.	PAD084375470			0.4		67.2			29.9				
WASTE CONVERSION INC.	PAD085890592	0.5				0.9	1.2	1.2	11.0	32.7		49.3	
SAFETY-KLEEN CORP.	PAD086873407		68.4										
SAFETY-KLEEN CORP.	PAD980552020		84.2										
SAFETY-KLEEN CORP.	PAD981737109		93.8										
SAFETY-KLEEN CORP.	PAD987266673		86.1										

Distribution of CAP Management Categories Utilized By Out of State Transfer Facilities In 1991

NAME	EPA ID	CAP MANAGEMENT CATEGORIES											
		RECOVERY					THERMAL		TREATMENT			DISPOSAL	
		Metals Recovery	Organics Recovery	InOrganics Recovery	Energy Recovery Solids	Energy Recovery Liquids	Incineration Liquids	Incineration , Solids	Fuel Blending	Wastewater & Sludges	Stabilization	Landfill	Deepwell
SAFETY-KLEEN CORP.	PAD987266715		93.4										
NORTHLAND ENVIRONMENTAL INC	RID040096352										100.0		
SAFETY-KLEEN CORP 2 105 01	VTD000791699		68.2										
POLLUTION SOLUTIONS OF	VTD982766537						19.7	0.3	53.7	7.1	1.0	13.9	

EXHIBIT B

NATIONAL CAPACITY ASSESSMENT REPORT:
Capacity Planning Pursuant to CERCLA Section 104(c)(9)

EPA530-R-95-016
NTIS PB95-20672

United States
Environmental Protection Agency
401 M Street SW
Washington, DC 20460

TABLE OF CONTENTS

Executive Summary

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires States to assure that adequate capacity exists to treat and dispose of hazardous wastes generated in the States for 20 years before EPA can provide any Superfund remedial action in the State. Under a program the Agency has implemented to help States fulfill this statutory mandate, States submitted Capacity Assurance Plans (CAPs) to the Agency as the basis of their assurance. The first CAPs were submitted to the Agency in 1989. Through these CAPs, each State had to demonstrate that it had sufficient in-state capacity or agreements with other States to assure capacity for 20 years. Because of concerns raised by the States over the 1989 CAP process, the Agency worked closely with the States to develop a CAP process focusing on national capacity. On May 1, 1994, the States submitted CAPs to the Agency pursuant to the May 1993 *Guidance for Capacity Assurance Planning*, OSWER Directive 9010.02. This Report describes the outcome of the CAP process pursuant to the Guidance.

Based on the information contained in the CAPs submitted May 1, 1994, along with other information that was available to EPA, the Agency has determined as documented in this report that there exists adequate national capacity in all CAP management categories through the year 2013. This Report assesses the data used during this analysis and presents the resolutions to a number of methodological issues raised in conducting this assessment.

The States' CAP submissions contained data demonstrating knowledge of their existing hazardous waste management systems and projecting through 2013 the demand for commercial management and the commercial management capacity for treating these hazardous wastes. Data was presented for the years 1991, 1993, 1999, and 2013 in 14 different waste management categories and focused primarily on wastes regulated under Subtitle C of RCRA. The Agency reviewed the State-submitted data for consistency and accuracy. EPA then calculated the total national maximum demand on commercial Subtitle C management by aggregating the States' projected demand and commercial capacity for the year 2013.

While the Agency's analysis has shown that there is adequate national capacity through 2013, States, market areas and/or regional groupings of States should continue hazardous waste planning activities. Further planning activities will add to States' knowledge of their hazardous waste management systems, help them implement waste minimization programs, and encourage companies to replace inefficient treatment technologies with safer and more innovative technologies. Moreover, the national hazardous waste management system is dynamic, as shown by the ongoing consolidation and restructuring of the hazardous waste treatment industry. Thus, there is no guarantee that the current projected surpluses of hazardous waste treatment and disposal capacity will continue to exist. Because of this, the Agency will continue to periodically assess the national capacity situation against the "baseline" assessment presented in this report. Accordingly, although the Agency believes the information presented in this Report accurately indicates the presence of significant future treatment and disposal capacity, the Agency will continue to collect and evaluate additional data, if necessary, to ensure that the requirements of CERCLA 104(c)(9) are satisfied. Specifically, EPA will continue to evaluate the effects of final rulemakings on the Subtitle C capacity situation using information in this report as a baseline analysis. EPA currently does not anticipate a need for a large-scale data collection from the states, and will only request additional capacity information from the States if the Agency's analyses find it necessary. Any additional data collection effort will be performed only after close consultation with the

States.

The Agency provided a draft of this Report to the States and the public for comment on the data and the procedures used to conduct the baseline national assessment. Based on the comments received on the draft Report, the Agency has finalized its assessment.

Introduction

Section 104(c)(9) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund law, requires States to assure that adequate capacity exists to treat and dispose of hazardous wastes generated in states for 20 years before EPA can provide any Superfund remedial action in the States. Under a program that EPA has implemented to help States fulfill this statutory mandate, States submitted Capacity Assurance Plans (CAPs) as the basis of their assurance. EPA then conducted an assessment of data from these plans to analyze the future availability of treatment and disposal capacity nationally through 2013. The statute specifies that adequate capacity must be within a State or outside a State in accordance with an interstate agreement or regional agreement or authority. In evaluating capacity nationwide, the Agency assumes private agreements for the interstate treatment or disposal of hazardous waste have been or will be executed if adequate capacity otherwise exists.

The Agency's baseline national assessment indicates that there exists adequate national capacity through 2013. This assessment is based on the data submitted by the States in their CAPs as well as other information that was available to EPA. In the case of States that did not submit a CAP, EPA used other data submitted by these States.

This Report describes: (1) the Agency's assessment that adequate national capacity exists, (2) the Agency's methodology used to conduct this assessment, and (3) the data used to conduct this assessment. The assessment was finalized with help from comments and new data that was used to supplement the Agency's draft assessment.

CERCLA 104(c)(9) requires that before Superfund remedial action is 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. Because the hazardous waste universe is dynamic, before contracts or cooperative agreements are signed with States, the Agency will utilize the baseline national assessment detailed in this Report, together with additional more recent data on generation and management trends, as appropriate, to ensure that the requirements of CERCLA 104(c)(9) are satisfied.

Background

The Agency's current policy and process for implementing the CERCLA 104(c)(9) capacity assurance requirement is presented in the *Guidance for Capacity Assurance Planning* document dated May 1993, hereafter referred to as the Guidance. The Guidance describes a three-phased approach for States to assure the future availability of hazardous waste treatment and disposal capacity. The three-phased approach involves assessing capacity on a national level (Phase 1); addressing any projected shortfalls by States that have a demand exceeding their supply of capacity in a shortfall management

category through waste minimization and continued development of both capacity that is permitted but not constructed and capacity with draft permits (Phase 2); and reevaluation of projected national capacity and addressing remaining national shortfalls with further state planning and waste minimization activities (Phase 3). This Report describes only the Phase 1 activities conducted to evaluate national capacity availability. Based on this final assessment, the Agency has determined that States do not need to submit Phase 2 or Phase 3 CAPs.

Overview of State Phase 1 Activities

States prepared Phase 1 CAP submissions that were due to the Agency on May 1, 1994. The submissions consisted primarily of six data tables titled:

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;

Table 4. Maximum Operational In-state Commercial Subtitle C Management Capacity;

Table 5. Demand for Commercial Hazardous Waste Management Capacity from Recurrent Waste Expected to be Generated in State; and

Table 6. Expected Maximum in-state Commercial Subtitle C Management Capacity.

States' Phase 1 CAP submissions, including these data tables, are available in EPA's RCRA Docket (Docket number F-92-CAGA-FFFFF). The first four tables demonstrate States' knowledge of their existing hazardous waste management systems; the last two tables show projected future demand for commercial management and projected commercial management capacity quantities for hazardous waste, respectively. The data provided by the States in the projection tables (i.e., Table 5 and Table 6), along with additional information on non-hazardous and Small Quantity Generator waste generation, were used by the Agency as the basis for its determination that adequate national capacity exists for the treatment and disposal of hazardous waste pursuant to Section 104(c)(9) through the year 2013. The CAP submissions focused primarily on wastes regulated under Subtitle C of RCRA. The Agency, when assessing capacity, also accounted for the impact of Subtitle D wastes on Subtitle C management capacity.

Some States chose to submit their CAP data collectively so as to be considered a single entity for the purposes of the Phase 1 national assessment. The collective submittals demonstrated these States' commitment to proactive dialogue for addressing regional waste management needs and provided an opportunity for these States to not have to submit a Phase 2 CAP. This opportunity would occur if EPA's national assessment identified projected national shortfalls, but the States submitting collectively had no projected shortfalls themselves, as demonstrated by combining their data.

The Agency provided States wishing to submit Phase 1 collectively the option to have the Agency present their individual data in aggregate form in this Report. The Agency received two collective submittals: one from the Western Regional Agreement, which consists of all the States in EPA Regions 8,

9, and 10, as well as Kansas, Nebraska, and Guam, and the other from the States of EPA Region 6. Only the States in the Western Regional Agreement asked that their data be presented in an aggregate form. In this Report, data from participants in the Western Regional Agreement are presented as the "Western States."

Data Development

Most States used the Biennial Reporting System (BRS) and the methodology in the Guidance to develop their data. Biennial Reports are completed by hazardous waste generators and treatment, storage, and disposal facilities 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. Some States used BRS-equivalent data sources to prepare their CAPs.

EPA provided States with instructions on how to use BRS data to produce CAP tables in the Agency's *Using Table Talk to Prepare CAP Tables Instructions Manual* (This document is available for review in the RCRA Docket). Following is a summary of the methodology used by most States to develop their CAP data.

Baseyear Data

The first step in developing data for the CAP submissions was to generate "baseyear" demand and capacity data. The year 1991 is the "baseyear" for most States because it is the most recent year for which States had a complete BRS database. States used the 1991 BRS data to estimate the demand for Subtitle C management capacity for on-site, captive, and commercial systems and the available quantities of commercial Subtitle C management capacity for the 14 CAP management categories. States that had 1992 data available chose to use that data instead, thereby avoiding some of the baseline data adjustments described in the following paragraph.

Baseline Data

After obtaining baseyear data, States had to adjust their demand and capacity data to change it from raw data direct from the BRS to data usable for making CAP projections. This adjusted set of data is referred to as baseline data and was used as the starting point for projecting future hazardous waste generation and management. Developing baseline demand data required adjusting the baseyear data, such as allocating the responsibility for assuring the adequacy of landfill capacity for certain treatment residuals (e.g., incinerator ash and stabilized residues) to those States where the waste was originally generated. Baseline capacity data does not differ from baseyear capacity data. It includes the capacity from operational units, including boilers and industrial furnaces (BIFs) burning hazardous waste, which came under RCRA regulation during 1991 and are currently operating under interim status.

1993 Projection Data

After developing their baseline data, States developed data for the first projection year, 1993.

States made projections only for recurrent wastes; States were not responsible for projecting one-time waste demand. Because of the substantial burden developing the one-time waste projections would have placed on the States, the Agency agreed to develop these projections. The document *One-time Waste Estimates for Capacity Assurance Planning* (available in the RCRA Docket) describes the methodologies used and provides the projections that were developed.

To move from baseline to the 1993 projection year, States adjusted both their baseline demand and commercial capacity data. The 1993 data is the baseline data adjusted to account for:

- The shift in the management of wastes from land disposal and land farming to alternate management practices due to the Land Disposal Restrictions requirements that became effective in 1992 and consequently are not reflected in the 1991 baseyear data;
- Shifts in management caused by the expiration of the F037 and F038 national capacity variances;
- The ultimate management of in-state wastes initially shipped to transfer/storage facilities;
- The closure of facilities and/or the declassification of hazardous wastes;
- The changes in capacity caused by commercial management facilities opening or closing between 1991 (or 1992, for those States using 1992 data) and 1993; and
- The decreases in in-state landfill capacity to reflect the depletion of landfill capacity over time.

1999 Projection Data

As requested in the Guidance, States also developed recurrent waste projections for 1999. The Agency, in conjunction with a National Governors' Association workgroup, determined that 1999 is the furthest year for which reasonably accurate projections from 1993 could be made. Generally, based on Agency recommendations, States reported in their CAPs that demand and commercial capacity remained constant between 1993 and 1999. Changes in demand and capacity between these years are due to plant closures, the opening of new facilities, and shifts in the kind of management certain wastes receive. As with the 1993 data, States accounted for the depletion of landfill capacity between 1993 and 1999 and the impact of closures of treatment and/or disposal units. States also included as capacity in the 1999 projection year other commercial units that are permitted, constructed, and operating partially, as well as capacity from unopened cells in permitted landfills.

2013 Projection Data

The States' 2013 projections were made consistent with the requirements of

CERCLA 104(c)(9) for a 20-year assurance, and were used by the Agency to conduct its national assessment. As recommended for the 2013 projection year, States held their demand constant from the 1999 levels. States also held their maximum available commercial Subtitle C capacity constant from 1999, again except for commercial landfill capacity, which was depleted over the projection period, or where it was known that a commercial facility will close.

Other Information in the Phase 1 CAP Submittals

Along with the data tables, most States also included in their Phase 1 submittals a narrative description of their current and planned waste minimization programs, written descriptions of changes in their State hazardous waste management systems since their last CAP submissions (in 1992), information regarding collective State planning efforts, and a list of commercial facilities in their State. Some States submitted a discussion of the public participation efforts they undertook to inform citizens about the State's hazardous waste planning activities.

The 1994 CAPs and the 1991 BRS National Report

Although most States used the 1991 BRS data to prepare their 1994 CAPs, there will be differences between the data in the *1991 BRS National Report* and the data contained in this Report. The *1991 BRS National Report* data and the CAP data are not directly comparable for the following reasons:

- The *1991 BRS National Report* identifies quantities of RCRA waste generated based upon the RCRA permit status of the unit managing a hazardous waste and therefore excludes from any national analysis RCRA wastes reported as managed in systems exempt from RCRA permitting requirements. The CAP identifies the potential demand for RCRA Subtitle C capacity and therefore, may include RCRA wastes that were shipped off-site to be managed in systems exempt from RCRA permitting requirements.

- The BRS identifies quantities of hazardous wastewaters generated, which includes direct discharges to POTWs and direct discharges to surface waters under NPDES. These quantities are excluded from the CAP demand estimates because they are managed in RCRA-exempt units.

- For their CAPs, States allocated "other" and "unknown" categories of BRS data to the appropriate management categories using their best judgement or other data sources.

- Some States used information in their own State data systems (usually containing information derived from manifests), not BRS data, to prepare their CAPs.

- The 1991 BRS Report includes data that are excluded from the CAPs, such as mixed radioactive and hazardous waste.

- CAP data contain the capacity from some RCRA-exempt commercial recyclers that the BRS data may not capture.

Overview of EPA Phase 1 Activities

EPA's primary role in Phase 1 was to ensure consistency among State data so that a national aggregation would be meaningful, and to identify problems with the Phase 1 submittals. EPA compiled the data submitted by the States, along with other available information, to assess the total national maximum demand on commercial Subtitle C management by CAP Management Category for all projection years by:

(1) Aggregating State projected demand for management of recurrent waste at commercial management systems;

(2) Reducing this sum by 10 percent[1] in the year 2013 to recognize ongoing waste minimization efforts; and

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

Once the national aggregate demand was calculated, the Agency assessed the maximum operational commercial capacity available nationwide by aggregating each State's Agency-adjusted maximum capacity projected for all projection years by CAP Management Category. The Agency then compared national demand to national supply to assess the availability of future management capacity for hazardous wastes.

Methodology Issues

Upon reviewing the data submitted by the States, the Agency identified some issues it needed to address before it could complete the assessment of national capacity. The following discussion describes the issues and their resolution. Most of the resolutions err on the side of overestimating demand and underestimating capacity. All adjustments to State data are described in Appendix C.

[1] This figure was obtained after consultation with the States as a conservative estimate of the effects of existing waste minimization activities on the generation of recurrent wastes.

Theoretical versus Practical Capacity

The Agency found that some capacity information reported from the BRS Process System forms was not useful for CAP purposes because the reported capacity was actually the maximum theoretical design capacity of the facility, not the practical operating capacity. To evaluate capacity for the facilities where this happened, the Agency calculated a practical operating capacity reflecting real-time operational limitations, which include such considerations as down-time, permit restrictions, and the optimization of operation for profit.

A confounding variable to the problem of excessive reported capacity is the conversion of capacity estimates into consistent units of measurement. Theoretical management system design capacity estimates are often measured in units such as British Thermal Units (BTU) per hour for incinerators and cubic yards for landfills. Since tonnage was the measurement unit requested for all CAP information, many facility capacities had to be converted to tons. This was done by making assumptions about operating conditions and average waste characteristics. For example, when an incinerator designed on a BTU per hour basis is converted to tons per year, assumptions about average waste heating value and density need to be made. Often the assumptions developed assumed ideal, not real-time operation.

To resolve the issue of theoretical versus practical capacity, the Agency compared the State-reported capacities to other data sources (e.g., the Hazardous Waste Treatment Council Industry Survey and the *EI Digest* -- see References section). The Agency assigned practical capacity amounts to the facilities whose capacities differed most substantially from the data sources available to the Agency. These facilities are noted in Appendix C.

CAP Management Categories

The CAP Management Categories "Incineration - Sludges/Solids" and "Energy Recovery - Sludges/Solids" were developed assuming they would capture capacity only for nonpumpable wastes (i.e., wastes that could not be injection-fed into a combustion unit); however, some liquid injection incinerators reported in the BRS capacity for these categories as well as for "Incineration - Liquids and Gases and "Energy Recovery - Liquids". As the Agency discovered, this double-counting primarily occurred due to the wide interpretations of the term "sludge." To address this issue, the Agency developed pumpable and nonpumpable categories and included in these categories the appropriate system types.

The Agency also found that the BRS system codes for management by "Incineration" and "Energy Recovery" were reported inconsistently by generators and combustion facilities when they described how wastes were being managed. To address this issue for purposes of the capacity assessment, the Agency combined the categories into the two combustion management categories - Combustion - pumpable and Combustion - nonpumpable.

Effects of Regulatory Changes on Capacity

The CAP methodology only incorporates EPA regulations finalized by 1992. In order to conduct a broader capacity assessment, the Agency reviewed the major EPA regulatory developments since 1992 that may effect capacity. This review indicates that the proposed Hazardous Waste Identification Rulemaking (HWIR) and the Land Disposal Restrictions (LDR) rulemakings might have the most impact

on Subtitle C waste management.

HWIR is an ongoing Agency effort which, if finalized, may modify the definition of hazardous waste. HWIR may decrease the demand from one-time and recurrent wastes on commercial Subtitle C capacity. HWIR probably will encompass two proposals. "HWIR-waste" could modify certain regulations regulating "listed" hazardous waste. Certain current regulations, including the "mixture" and "derived-from" rules, apply to listed wastes regardless of the concentration and the mobility of toxicants in the wastes, thereby regulating certain low risk waste - in particular, treatment residuals. The modifications may establish exemption standards for these low risk wastes. Additionally, the exempted wastes may no longer be subject to some of the hazardous waste management requirements. "HWIR-media" may modify the regulations for media contaminated with hazardous wastes (analogous to one-time wastes). This modification may allow media contaminated with hazardous wastes that have low concentrations of hazardous constituents to be regulated under rules less stringent than Subtitle C.

Land Disposal Restrictions (LDR) regulations set treatment standards for the disposal of hazardous wastes. EPA has developed six major LDR rulemakings to date. Most recently, the Agency's LDR Phase II rule (59 FR 47982) set treatment standards for wastes that have been identified as characteristically hazardous due to the presence of 25 organic constituents identified in the recent toxicity characteristic (TC) rule, coke and coke by-product wastes, cholorotoluene wastes and soil contaminated with the above listed wastes. Since the majority of these wastes contain organic constituents, the combustion technologies are most likely to be affected by this new rulemaking (see discussion later in this Report for our assessment.)

Demand from Wastes Generated by Small Quantity Generators

States were not asked to account for the demand from small quantity generators (SQGs) in their CAPs because SQGs are not required by federal law to complete a Biennial Report form. Although most States cannot gather SQG information from their State BRS data bases, EPA was able to obtain estimates of the demand on commercial management from SQGs using the BRS National Oversight Database[2]. EPA identified the generators of waste that was received by commercial hazardous waste management facilities in 1991 by examining the commercial waste management facilities' Biennial Report Waste Received (WR) forms. The Agency deleted from this list the generators who reported on the Biennial Report Information and Certification (IC) forms that they were large quantity generators or did not generate hazardous waste in 1991. The Agency then used information from commercial facilities who reported receiving waste from the remaining list of generators (i.e., the potential SQGs) to determine how SQG wastes were managed. This analysis showed that SQG wastes comprise only about one percent of all hazardous wastes received by commercial treatment facilities nationally.

Demand from Nonhazardous Wastes

As with SQG wastes, many States were unable to obtain the demand from nonhazardous waste from their State BRS databases. Nonhazardous wastes are wastes that are neither characterized as State hazardous nor federally defined as RCRA hazardous. The overall management trend for nonhazardous

[2] The BRS National Oversight Database is maintained by EPA and contains BRS data from all states, including those that do not use the Biennial Report Forms.

wastes is disposal in Subtitle D landfills.

While the demand for capacity from nonhazardous waste varies considerably by CAP Management Category, the demand from nonhazardous wastes as it relates to assessment of future capacity primarily affects the landfill CAP management category since landfill capacity depletes over time. EPA was able to estimate landfill demand from nonhazardous waste through discussions with the treatment industry and using estimates found in literature. The Agency's analysis of this demand appears in Table VI under the column "Non-RCRA Industrial Wastes."

Demand from Mixed Hazardous and Radioactive Wastes

As part of the Low-Level Radioactive Waste Policy Act (LLRWPA) of 1980 and its 1985 amendments, individual states or groups of states that form compacts are responsible for disposing of all the low-level radioactive mixed waste generated within their borders, except for waste produced by federal facilities (which the federal government has taken responsibility for). This Act establishes a waste management planning, treatment, and disposal framework independent of the CAP process that specifically deals with the disposal of non-federal radioactive mixed waste. For federal radioactive waste, the Federal Facilities Compliance Act establishes a planning process to ensure that these wastes are properly managed. In the Agency's judgment, treatment capacity for radioactive mixed wastes will be met through these planning mechanisms.

Discussion of National Data Aggregated by EPA

The tables which appear on pages 16 - 21 of the Report show EPA's aggregation of State-submitted data. The Agency adjustments to the State-submitted capacity data appear in Appendix C.

Table I, titled "1991 National Baseyear Data Representing Hazardous Waste Generated and Managed On Site," shows a national aggregation of 1991 baseyear demand data for waste managed onsite from their CAP Table 1.

Table II, titled "1991 National Baseyear Data Representing Management of Hazardous Waste in Captive Systems," presents the States' CAP Table 2 data aggregated nationally. This information was obtained by summing the quantities reported by States as wastes generated and managed in-state at captive facilities with the quantities of waste that are exported to captive facilities in other States. Captive facilities are facilities owned by the same company as the generator, but are at a different physical location. Their capacity can only be used by generators under the same ownership or by generators with whom the facility has an agreement to manage their waste.

Table III, titled "1991 National Baseyear Data Representing Management of Hazardous Waste in Commercial Systems," shows data from the State-submitted CAP Tables 3 and 4. These data were used as the starting point in developing projections. National demand figures for the baseyear were calculated by adding exports to wastes generated and managed in-state from State-submitted CAP Table 3 and then adding the maximum operational in-state commercial management from State-submitted CAP Table 4.

Table IV, titled "National Baseline and Projected Demand for Commercial Hazardous Waste Management Capacity," reports aggregated State demand for commercial capacity. This table shows the sum of each State's baseline and projection year recurrent waste demand data. The data, which has been adjusted by the Agency, is from CAP Table 5. Attached in Appendix A are the individual State-submitted tables showing this information. Also included in Table IV are the nationally aggregated one-time waste estimates that were developed by the Agency.

Table V, titled "National Baseline and Projected National Commercial Subtitle C Management Capacity," shows capacity data for the baseline and projection years submitted by States in their CAP Table 6, with Agency adjustments (which appear in Appendix C). Appendix B contains the individual State-submitted tables showing this information. Appendix D lists the commercial management facilities that make up this capacity.

National Assessment of Future Capacity

Table VI, titled "National Capacity Assessment of Projected Remaining Commercial Subtitle C Capacity Not Utilized by Hazardous Wastes," shows in the first column maximum available commercial capacity from Table V minus the demand for 2013 from Table IV. The second, third, and fourth columns estimate the impact of the additional increases in demand that States were not asked to account for in their CAP submissions. The Land Disposal Restrictions Phase II rulemaking and demand from Small Quantity Generators and Industrial Subtitle D wastes will place additional demand on capacity. The final column shows the Agency's assessment of future capacity when considering the impacts of future Agency regulatory activities and the impact of waste demand not included in the State CAPs.

Assessment of New Rulemakings on Projected National Capacity

Although the LDR Phase II rulemaking will probably increase the demand for all treatments, the solids combustion category will be most affected by this rulemaking. Table VI indicates that, based on information made available with the rulemaking, there will exist sufficient combustion capacity for managing the hazardous wastes expected to be generated nationwide. In the next few years, the LDR program plans to finalize Phase III and Phase IV rulemakings. Both these rulemakings may increase the need for treatment capacity; however, EPA anticipates that future increases in demand for treatment of hazardous wastes due to the impact of the LDR program may be offset by the impact of HWIR. Regardless of the impact of the LDR Phase II and HWIR rulemakings, EPA believes the States have shown for the purpose of CERCLA 104 (c) (9) that there is adequate national capacity.

Assessment of EPA Demand Estimates on Projected National Capacity

An Agency analysis of the 1991 national BRS data showed that the demand from SQGs accounts for only 1 percent of the total demand on commercial Subtitle C management across all CAP Management Categories. The percentage contribution of SQGs on demand varies by CAP Management Category but is generally less than 4 percent of the total waste managed in each category.

During the development of the CAP Guidance, several States raised concerns about the demand being placed on commercial facilities by non-RCRA, non-state hazardous waste. The Agency found, based on a trade journal study, that about 20 percent of the waste going to landfills is neither RCRA nor State-hazardous. Again, however, this demand is more than covered by the available capacity, as can be

seen in Table VI.

Conclusions

Based on its analysis of the data in this report and from other sources, the Agency has determined as documented in this report that adequate national capacity for the treatment and disposal of hazardous waste exists through the year 2013. Although EPA believes there is national capacity, States and regional groupings of States should continue hazardous waste management planning activities to assist EPA in ensuring that adequate capacity exists in the future. Further hazardous waste planning efforts may be important to a State and regional groupings of States for a number of reasons, including furthering and updating knowledge of hazardous waste management systems, helping to implement waste minimization programs, and encouraging companies to replace inefficient treatment technologies with safer and more innovative technologies.

While each State has demonstrated that there is adequate hazardous waste treatment and disposal capacity, there is the potential for unforeseen circumstances (e.g., new federal regulations, taxes on management, statutory limitations on landfills, and changing market conditions) that could affect the future availability of management capacity. Nationally, the industry is consolidating and restructuring. The hazardous waste market's dynamism makes it difficult to guarantee that the current surpluses of hazardous waste management capacity will continue to exist. These factors should also prompt States to monitor the hazardous waste universe and continue their planning activities.

EPA recognizes that many States included as available capacity for 2013 facilities that were not in full-scale commercial operation or were operating under interim status in 1993. The inclusion of such facilities in CAPs is not evidence of a commitment on the part of the Agency or the States to bring these facilities on-line or to grant them part B permits. Capacity planning is intended to project into the future based on historical data and current knowledge. Including management facilities not yet fully operational or operating under interim status does not imply a State certification or intention that these facilities will receive their permits or become fully operational but rather is an attempt to evaluate future capacity based on the information representing waste management today. States and the Agency will continue to analyze capacity information, removing facilities that have dropped from the permitting process. Accordingly, although the Agency believes the information presented in this Report demonstrates the presence of significant treatment and disposal capacity, the Agency will continue to periodically collect and evaluate data to ensure that the requirements of CERCLA 104(c)(9) are satisfied.

References

Guidance for Capacity Assurance Planning, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER Directive 9010.02, May 1993

One-Time Waste Estimates for Capacity Assurance Planning, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER Directive 530-R-94-002, August 1994

Using Table Talk to Prepare CAP Tables, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER, October 1992

Background Document for Capacity Analysis for Land Disposal Restrictions Phase II - Universal Treatment Standards, and Treatment Standards for Organic Toxicity Characteristic Wastes and Other Newly Listed Wastes, Office of Solid Waste and Emergency Response, August 1994

Hazardous Waste Treatment Council 1993 Survey of Commercial Hazardous Waste Incineration Capacity, in *Phase II Background Document* cited above

EI Digest, April 1993

Demand for Commercial Hazardous Waste Capacity from Recurrent Landfill Expected to be Generated In State (tons)

State	Baseline	Demand for Commercial Subtitle C Management Capacity			State	Baseline	Demand for Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	22,479	16,536	16,361	16,361	New Hampshire	3,198	2,646	2,635	2,635
Arkansas	46,800	46,800	46,800	46,800	New Jersey	171,338	176,449	176,449	176,449
Connecticut	29,253	21,713	21,713	21,713	New Mexico	770	584	584	584
Delaware	2,249	2,044	2,044	2,044	New York	57,010	57,290	57,290	57,290
District of Columbia	116	125	125	125	North Carolina	9,019	8,732	8,732	8,732
Florida	11,151	11,435	11,435	11,435	Ohio	106,308	104,101	104,101	104,101
Georgia	16,437	14,073	14,073	14,073	Oklahoma	3,199	3,448	3,448	3,448
Illinois	87,518	64,213	64,213	64,213	Pennsylvania	61,452	63,235	63,235	63,235
Indiana	7,981	47,502	47,502	47,502	Peurto Rico	2,050	1,985	1,985	1,985
Iowa	6,537	6,593	6,593	6,593	Rhode Island	8,322	8,322	8,322	8,322
Kentucky	24,671	24,671	24,671	24,671	South Carolina	39,662	39,662	39,662	39,662
Louisiana	30,103	26,435	26,435	26,435	Tennessee	22,055	22,329	22,329	22,329
Maine	6,180	6,180	6,180	6,180	Texas	160,000	161,000	161,000	161,000
Maryland	3,635	4,480	4,480	4,480	Vermont	3,643	5,516	5,516	5,516
Massachusetts	26,912	6,912	6,912	6,912	Virgina	9,777	9,412	9,412	9,412
Michigan	85,399	85,799	85,799	85,799	West Virginia	13,696	21,357	21,357	21,357
Minnesota	15,999	15,889	15,889	15,889	Wisconsin	11,190	11,071	11,071	11,071
Mississippi	5,655	5,245	5,245	5,245	Western States	483,998	483,082	483,082	483,082
Missouri	11,459	10,560	10,560	10,560					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

Expected Maximum Commercial Subtitle C Management Capacity for Landfill (tons)

State	Baseline	Commercial Subtitle C Management Capacity			State	Baseline	Commercial Subtitle C Management Capacity		
		1993	1999	2013			1993	1999	2013
Alabama	517,189	600,000	600,000	600,000	New Hampshire	0	0	0	0
Arkansas	0	0	0	0	New Jersey	0	0	0	0
Connecticut	0	0	0	0	New Mexico	0	0	0	0
Delaware	0	0	0	0	New York	308,750	1,174,770	2,831,010	2,028,900
District of Columbia	0	0	0	0	North Carolina	0	0	0	0
Florida	0	0	0	0	Ohio	235,000	2,319,000	1,694,394	236,980
Georgia	0	0	0	0	Oklahoma	1,261,260	1,257,812	1,240,574	1,212,993
Illinois	1,476,089	1,347,663	962,387	63,407	Pennsylvania	0	0	0	0
Indiana	4,881,459	4,883,956	4,548,942	3,883,909	Puerto Rico	0	0	0	0
Iowa	0	0	0	0	Rhode Island	0	0	0	0
Kentucky	0	0	0	0	South Carolina	97,906	135,000	0	- 555,268
Louisiana	6,409,891	4,992,557	4,833,947	4,489,781	Tennessee	0	0	0	0
Maine	0	0	0	0	Texas	1,343,000	1,701,000	735,000	-1,519,000
Maryland	0	0	0	0	Vermont	0	0	0	0
Massachusetts	0	0	0	0	Virgina	0	0	0	0
Michigan	1,150,510	850,000	250,000	0	West Virginia	0	0	0	0
Minnesota	0	0	0	0	Wisconsin	0	0	0	0
Mississippi	0	0	0	0	Western States	27,125,854	28,177,306	27,016,049	21,558,462
Missouri	0	0	0	0					

* Western States: AK, AZ, CA, CO, GU, HI, ID, KS, MT, NE, NV, ND, OR, SD, UT, WA, WY

EXHIBIT C

United States Environmental Protection Agency | Solid Waste and Emergency Response (5305) | EPA530-R-94-002 PB95-167 235 January 1995

EPA

One-time Waste Estimates for Capacity Assurance Planning

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

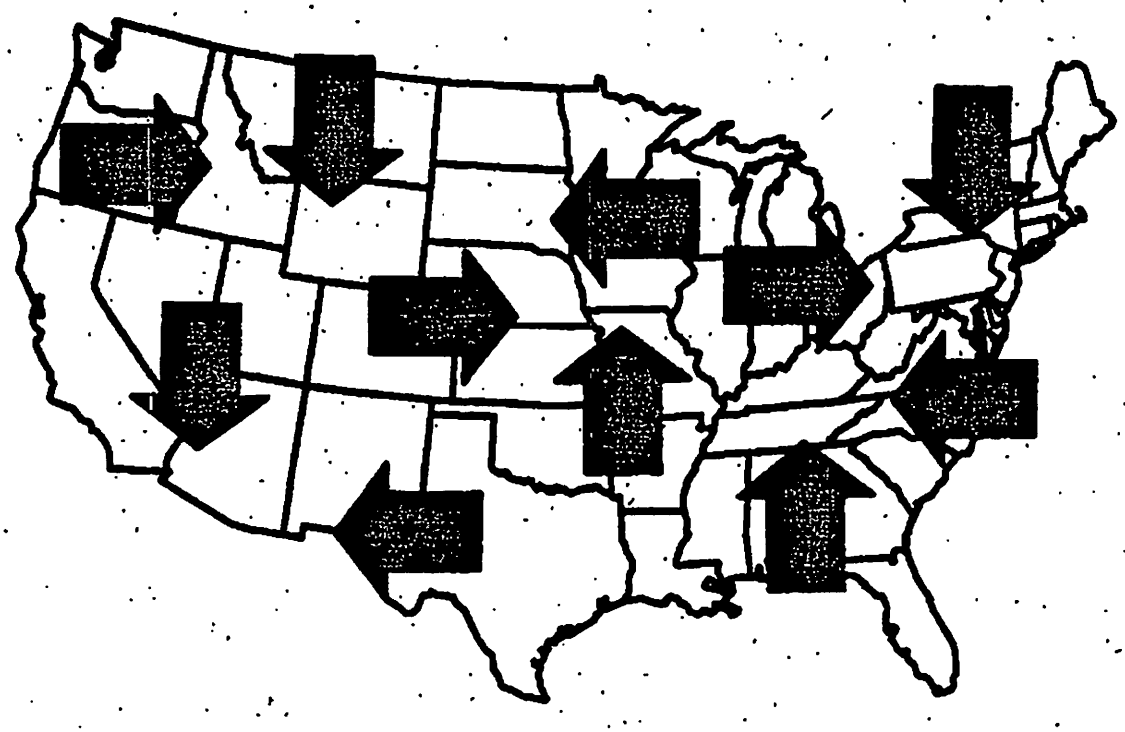

TABLE OF CONTENTS

BACKGROUND AND SUMMARY

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

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

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

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

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

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

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

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

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

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

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

1. SUPERFUND REMEDIAL ACTIONS

1.1 INTRODUCTION

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

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

1.2 DATA SOURCES

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

1.2.1 SUPERFUND RODs

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

HAZDATA and BASECOST

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

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

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

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

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

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

SUMROD

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

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

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

Hazardous Waste Identification Rule RODs Database

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

in-situ versus ex-situ management. Data for RODs signed in 1992 and 1993 were used by EPA for the CAP one-time waste projections.

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

1.2.2 NPL Technical Data Files

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

1.2.3 1992-1993 Guide to Superfund Sites

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

1.2.4 CERCLIS Remedial Event Schedule (CRES) Database

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

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

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

1.3 METHODOLOGY

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

1.3.1 Identify Sites with Potential Off-site Waste Generation

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

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

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

1.3.2 Estimate Volume of Waste to be Generated at Each Site

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

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

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

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

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

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

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

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

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

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

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

1.3.4 Determine the Proportion of Waste Managed Off Site

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

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

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

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

1.3.5 Allocate Off-site Waste to CAP Management Categories

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

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

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

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

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

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

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

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

1.4 REFERENCES

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2. SUPERFUND REMOVAL ACTIONS

2.1 INTRODUCTION

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

2.2 DATA SOURCES

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

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

(2) 1991 Biennial Report data; and

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

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

2.3 METHODOLOGY

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

2.3.1 Removal Actions Nationally Each Year Through 1999

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

2.3.2 Number of Removal Actions in Each State

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

2.3.3 Annual Volume Managed Off Site

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

Percentage of Removals that Generate Hazardous Wastes Managed Off Site

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

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

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

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

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

Average Volume of Waste Per Removal With Off-site Management

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

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

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