ECONOMIC ASSESSMENT OF THE HAZARDOUS WASTE MANAGEMENT REQUIREMENTS RULE

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CHAPTER 1: INTRODUCTION

The U.S. Environmental Protection Agency (EPA or Agency) has prepared this *Economic Assessment of the Hazardous Waste Management Requirements* (also known as the Hazardous Waste Identification Rule for Contaminated Media, or HWIR-Media) to accompany the Agency's final rulemaking covering the management of RCRA hazardous remediation wastes. This report summarizes the final HWIR-Media rule and describes EPA's efforts to estimate the cost savings and benefits of the new requirements. The main provisions of the rule cover:

- Remedial action plans (RAPs) which will be faster and easier to obtain than traditional RCRA permits or permit modifications;

- Staging piles, a new type of RCRA unit for the temporary storage of remediation waste; and

- An exemption from RCRA Subtitle C for materials dredged under permits issued under the Marine Protection, Research and Sanctuaries Act (MPRSA) or the Clean Water Act (CWA) to reduce confusion and dual regulation of dredged materials.

Currently, all hazardous remediation wastes are subject to the same RCRA Subtitle C requirements as newly generated hazardous wastes. Subtitle C requirements, however, are not always appropriate for the management of hazardous remediation waste and frequently slow the pace of cleanups or discourage firms from performing cleanup activities. On April 29, 1996, EPA published a comprehensive regulatory proposal designed to remove low-risk contaminated media from the Subtitle C system and streamline permitting requirements for on-site management of remediation waste (62 Federal Register 18779). Since the proposal was published, the Agency has continued to examine the issues surrounding HWIR-Media and has concluded that pursuing comprehensive regulatory reform would be both time and resource intensive, and would most likely result in a rule that would provide additional years of litigation and uncertainty. This uncertainty would be detrimental to the program and have a negative effect on both ongoing and future cleanups.

Instead, EPA decided to promulgate targeted elements of the HWIR-Media proposal. Previous to this rule, EPA finalized new soil treatment standards for contaminated soils as part of the Phase IV Land Disposal Restrictions (LDR) rulemaking. The HWIR-Media final rule contains the three provisions mentioned above. EPA is withdrawing all other provisions of the HWIR-Media proposal, including the bright-line approach and withdrawal of the Corrective Action Management Unit (CAMU) rule.

This economic assessment has been completed in compliance with Executive Order 12866, which requires federal agencies to assess the costs, benefits, and impacts of "major regulations." Based on this analysis, EPA expects that the final rulemaking will:

- Result in minor cost savings at some cleanups performed at RCRA permitted or state facilities because RAPs are less burdensome than permit modifications;

- Reduce RCRA Subtitle C regulatory compliance costs for cleanups performed under state superfund and voluntary programs by approximately $5 to 35 million per year;

- Increase the number of cleanups performed each year, as RAPs provide a simplified way to remediate contaminated sites and do not trigger facility-wide corrective action liability; and

- Reduce the costs of storing of remediation waste before on-site treatment or off-site shipment through the use of staging piles.

Additionally, this analysis concludes that the exclusion from RCRA regulation for sediments managed under MPRSA permits will likely have negligible effects on entities managing such materials.

The remainder of this introductory chapter has four parts. The first three parts summarize the final rule provisions covering RAPs, staging piles, and dredged navigational sediments. The fourth section outlines the remainder of the report.

1.1 Remedial Action Plans

In order to facilitate the permitting of contaminated sites wanting to treat, store for more than 90 days, or dispose of hazardous remediation waste on site, EPA is finalizing, as part of the HWIR-Media rulemaking, provisions for RAPs. RAPs are designed to address the particular needs of facilities wanting to cleanup all types of hazardous remediation waste that would otherwise need to be covered under a full RCRA permit or permit modification, including hazardous contaminated soil, sediment, groundwater, sludges, or debris. Until now, the treatment, storage, or disposal of hazardous remediation waste required the same type of permit as hazardous process waste management. RAPs will be an alternative form of RCRA permit that will serve as an administrative mechanism for documenting, providing for public review and comment, and enforcing site-specific permit requirements. Importantly, HWIR-Media does not change, in any way, the conditions under which a RCRA permit is required. RAPs simply provide a substitute for RCRA permits in cases where permits related to the cleanup of hazardous remediation waste are needed under existing requirements.

As required by 40 CFR 270.68(e), RAPs must include the following data:

- General facility information;
- A characterization of the contaminated areas and origin of the contamination; and
- Information sufficient to ensure compliance with applicable Part 264-266, 268, and 270 standards.

Importantly, facility-wide corrective action requirements mandated by RCRA Section 3004 (u) and (v) will not apply to facilities addressing hazardous waste contamination under a RAP, unless those facilities are already subject to such requirements. Thus, an unpermitted facility using a RAP to cleanup a known contaminated site will not be obligated to conduct facility-wide investigations for contamination requiring corrective action. RAPs are similar to remediation management plans (RMPs), which were included in the HWIR-Media proposal, but RAPs will not:

- Document and enforce alternative or contingent management practices to justify exempting hazardous contained media from hazardous waste regulation through a contained-in decision; or
- Provide relief from hazardous waste regulation other than relief from RCRA 3004(u) and (v) facility-wide corrective action requirements and procedural permitting requirements, as noted earlier.

1.2 Staging Piles

This rulemaking establishes a new RCRA unit called a staging pile, which must be approved under a RAP, a RCRA permit, or a CERCLA decision document. Staging piles are intended for temporary (two years, with a six-month extension period available) staging and storage of remediation wastes during remedial operations. Staging piles will provide greater flexibility for decision-makers to implement protective, reliable, and cost-effective remedies. While similar to remediation piles, which were proposed in the 1996 HWIR-Media proposal, staging piles do not allow for treatment which EPA believes is more appropriately performed in CAMUs. Rather, staging piles are intended to complement CAMUs and temporary units (TUs) by facilitating the management of remediation waste and thereby encouraging cleanup activities.

Hazardous remediation waste placed in staging piles will not require pre-treatment to the applicable LDR treatment standard. EPA believes that requiring compliance with LDRs prior to storage in a staging pile is inconsistent with the temporary nature of a staging pile. Since staging piles are temporary and will be

designed and operated according to requirements tailored to site- and waste-specific characteristics, they will, by definition, eliminate the long-term uncertainty LDRs were designed to address. However, hazardous remediation waste will have to comply with applicable land disposal restrictions at the time of subsequent disposal.

Staging piles do not replace existing mechanisms that allow remediation waste managers to tailor RCRA requirements. These include CAMUs, temporary units, and the area of contamination (AOC) policy. Rather, staging piles provide an additional mechanism that may be used for short-term storage of remediation waste when the AOC concept does not apply and tank or container storage is infeasible or unreasonable.

1.3 Dredged Navigational Sediments Exclusion

The third part of the HWIR-Media rule is an exclusion from the definition of hazardous waste for dredged materials that are managed in accordance with a permit under Section 404 of the CWA or Section 103 of the MPRSA. Currently, dredged material proposed for disposal in an aquatic environment could be regulated under RCRA Subtitle C if it contains listed hazardous waste or exhibits any of the four hazardous characteristics: ignitability, corrosivity, reactivity, or toxicity. The purpose of this exemption is to clarify regulatory roles within EPA and avoid potential overlaps between RCRA and CWA or MPRSA regarding the disposal of dredged materials carried out in compliance with the CWA and the MPRSA. It is important to note that the wastes are exempt from RCRA only if they are managed in accordance with a permit issued under CWA Section 404 or MPRSA Section 103.

1.4 Outline of This Document

This report discusses the savings associated with the three parts of the HWIR-Media rule summarized above. The remainder of this report is organized as follows:

- Chapter 2 presents the analysis methodology and results for each of the three provisions described above; and

- Chapter 3 analyzes HWIR-Media rule with relation to regulatory requirements concerning regulatory flexibility, unfunded mandates, and environmental justice.

CHAPTER 2. METHODOLOGY AND RESULTS

This chapter describes the methodology for estimating the cost savings and major impacts of the HWIR-Media rulemaking and the results of the analysis. It is organized as follows:

- Section 2.1 analyzes RAPs;
- Section 2.2 addresses staging piles; and
- Section 2.3 discusses the dredged sediments exclusion.

2.1 Cost Savings of RAP Provisions

As explained in Chapter 1, RAPs provide a streamlined approval process for remedial actions that currently must be covered under a full RCRA permit or permit modification. Because RAPs will be less burdensome and less expensive to obtain than RCRA permits, EPA expects that the new provisions will result in:

- Small savings at some cleanups at RCRA permitted facilities;
- Savings ranging from $6 to 33 million per year at cleanups performed under state superfund and voluntary programs; and
- An increase in the number of cleanups performed each year because some contaminated sites where remediation is not planned are likely to be cleaned up.

This section begins by discussing the differences between performing hazardous remediation waste cleanup under existing requirements and under RAPs. Next, it presents EPA's methodology and results of analyzing the effect of RAP provisions on:

- CERCLA and RCRA permitted cleanups;
- State superfund and voluntary program cleanups; and
- Contaminated sites where remediation is not planned.

The analysis uses a five-year planning horizon because of the uncertainties associated with longer-term projections and the pace with which the rule will be fully implemented at remediation sites. Longer-term projections are subject to substantial uncertainties, such as government remediation and enforcement budgets, potential changes in statutes governing contaminated site cleanup, changes in treatment technologies, and the demand for restoring economically valuable contaminated properties (e.g., Brownfields).

To facilitate clear understanding of the potential impact of the RAP provisions, EPA's analysis divided the universe of potentially affected cleanups into three groups:

- CERCLA or Superfund sites. CERCLA cleanups will not be significantly affected by the RAP provisions because they are generally exempt from RCRA permitting requirements. Under CERCLA Section 121(e), "[n]o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with" CERCLA Section 121.[1]

- RCRA permitted or interim status facilities. These facilities are subject to RCRA 3004(u) and (v) corrective action requirements in the baseline, that is, in the absence of the final rule. The promulgation of the RAP provisions, therefore, will not induce these facilities to shift their remediation management approach, for example, from off-site to on-site treatment. Instead, these facilities will experience only a minor potential incremental savings due to the less rigorous requirements for RAPs versus permit modifications for permitted facilities or permits for interim status facilities.

- Facilities without RCRA permits or interim status, including facilities cleaned up under state superfund and voluntary cleanup programs. If these facilities conduct hazardous waste remediation, they must manage the waste off site, unless they are located in states with RCRA permit waiver authority. (Some states with EPA-authorized RCRA programs have the authority under their state statutes and/or regulations to waive permitting requirements for corrective action, which is comparable to EPA's waiver authority under CERCLA Section 121(e) or RCRA Section 7003. In these states, facilities may be allowed to treat, store for more than 90 days, or dispose of hazardous remediation waste on site without obtaining a RCRA permit, provided they manage the waste under the oversight of the appropriate state program.[2]) Excluding facilities in such states, the RAP provisions will encourage these facilities to shift from off-site to on-site treatment including to less expensive in-situ treatment, because on-site treatment under a RAP will not subject the site to facility-wide corrective action under RCRA 3004(u) and

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[1] 42 USC 9621(e).

[2] Memorandum from J. Winston Porter, EPA Assistant Administrator, entitled "RCRA Permit Requirements for State Superfund Actions," November 16, 1987.

(v). As a result of this shift, facilities will experience an estimated $6 million to $33 million per year in savings from reduced waste transportation and treatment costs.

Exhibit 2-1 summarizes the impact of the RAP provisions on these three groups. The following sections discuss the impact of the RAP provisions on the latter two types of facilities. CERCLA sites are not addressed further because they generally are not subject to RCRA permitting requirements.

Exhibit 2-1. Estimated Impacts of the Remedial Action Plan (RAP) Provisions

Remediation Program	RCRA Permit Requirements	Baseline Management	Impact of RAPs
CERCLA	Exempt from permitting under CERCLA §121(e)	On-site or off-site	No changes
RCRA Corrective Action	Permit or interim status required for TSDFs	On-site or off-site	No changes in management; minor savings from using RAPs instead of permits
State Superfund and Voluntary			
-- States with permit waiver authority	Exempt from permit requirements	On-site and off-site	No changes in management
-- States without permit waiver authority	Permit requirements avoided by use of off-site management	Off-site	Shift to some on-site treatment, including in-situ treatment; resulting transportation and treatment cost savings

2.1.1 Cleanups Performed at RCRA Permitted Sites

Facilities that will be cleaned up under RCRA permits are not expected to recognize significant cost savings from the RAP provisions. Under current requirements, permitted facilities must submit a RCRA permit modification in order to obtain the authority to treat, store for longer than 90 days, or dispose of remediation waste on site. Under HWIR-Media, these facilities could obtain the authority to manage remediation waste on site by submitting either a RAP or a permit modification. Facilities submitting a RAP must integrate its provisions into their existing permit through the

appropriate permit modification procedures in 40 CFR Part 270, Subpart D. In these cases, RAP approval will follow the procedures for the appropriate class of permit modifications (class I, II, or III), instead of the RAP approval process in Section 270.68.

EPA believes that the facility owner or operator's decision whether to pursue a traditional permit modification or to modify their permit with a RAP will most likely reflect the facility's perception of the relative merits of the RAP requirements in Section 270.68 or the permit modification requirements in 40 CFR Part 270, Subpart D. EPA expects that some facilities will use RAPs because they will be less burdensome than permit modifications. The Agency expects these savings to be small because:

- The RAP must be integrated into the permit using existing permit modification procedures. Thus, the contents of a RAP and a permit modification are likely to be similar.

- Permitted facilities will be unaffected by the changes to facility-wide corrective action requirements, as they assumed this liability when they submitted their Part A form.

Additionally, the Agency expects that interim status facilities beginning hazardous waste remediation will be affected in a manner similar to permitted facilities for two reasons. First, facilities operating under interim status assumed facility-wide corrective action liability when they submitted their Part A form. Second, these facilities will likely have already performed many of the activities required of a Part B permit in order to operate under interim status. Thus, EPA expects that the incremental cost for interim status facilities to obtain a RAP to cover activities associated with the cleanup of hazardous remediation waste is not significantly different than the incremental cost of obtaining a permit that covers remediation.

2.1.2 Cleanups Performed Under State Superfund and Voluntary Programs

In states without RCRA permit variance authority, facilities currently performing cleanups under state superfund and voluntary programs generally send their waste off site for treatment and disposal because on-site options require obtaining a RCRA permit. The new RAP provisions will provide a mechanism by which facilities that would otherwise treat their remediation waste off site because of the cost of RCRA permitting requirements can treat waste on site without obtaining a full-blown RCRA permit and assuming full corrective action liability. Such facilities can avoid off-site transportation costs and possibly use less expensive on-site treatment technologies, including in-situ remedies.

Several factors will influence the decision for on-site versus off-site treatment, including:

- The cost of obtaining the RAP;
- The relative costs of off-site versus on-site treatment;
- Uncertainties in predicting the cost of on-site remedies;
- Transportation costs for off-site options;
- The risk of future releases of residuals from inadequate on-site remedies;
- The risk of liability for releases from off-site management facilities; and
- Community relations.

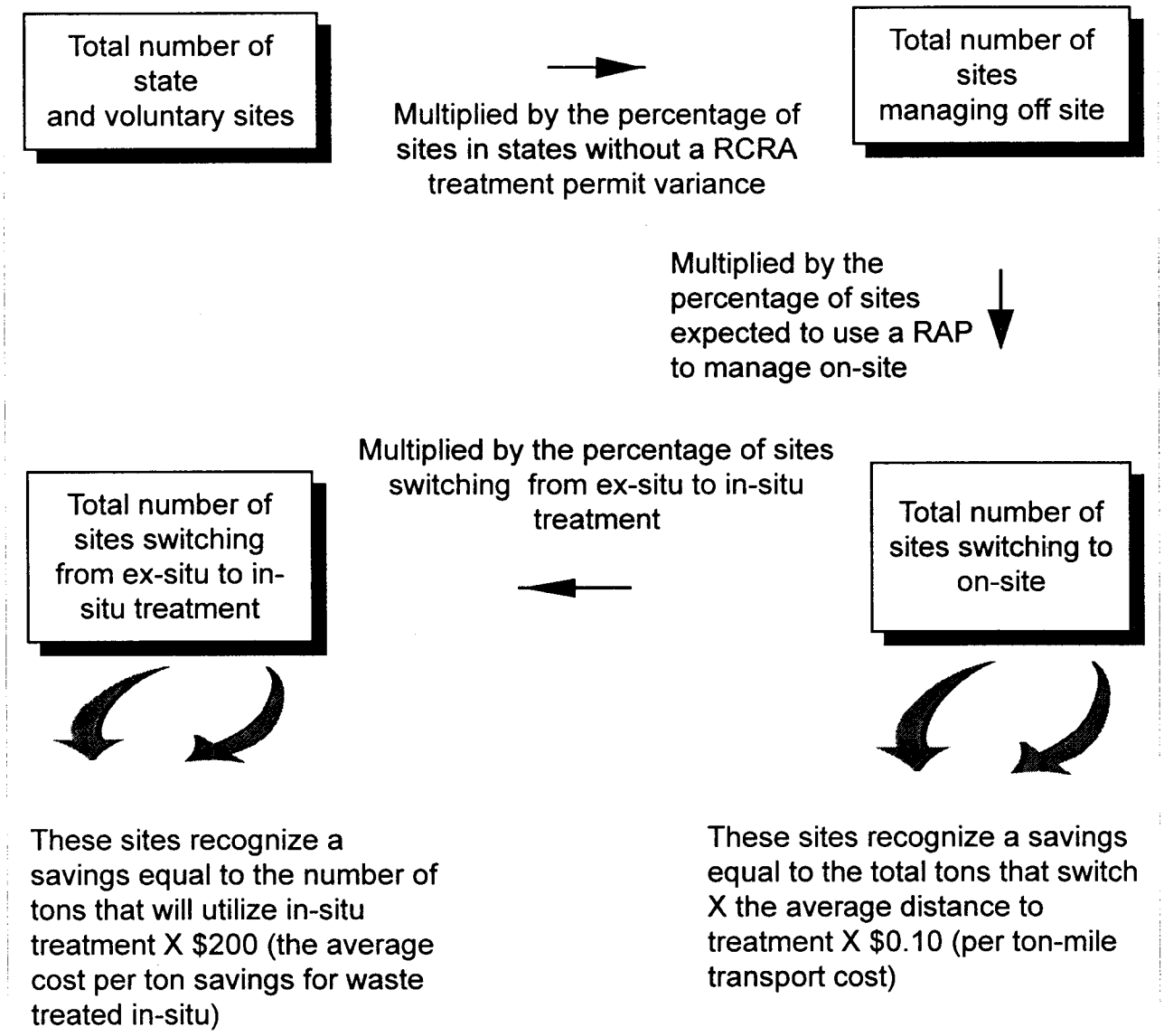
In general, due the number of factors affecting the on-site versus off-site treatment decision, EPA does not expect that facilities will choose on-site treatment under a RAP over off-site remedies unless they anticipate significant long term-cost savings. Thus, the following analysis was designed to identify situations where significant cost savings will be recognized because of the new RAP provisions.

In order to estimate the RAP-related savings to contaminated sites cleaned up under state superfund and voluntary programs, EPA performed the following steps:

- Estimated the total number of sites and the overall volume of hazardous remediation waste managed under state superfund and voluntary cleanup programs;
- Estimated the number of sites that will likely be affected by RAP provisions;
- Projected the volume of remediation waste that will likely switch from off-site to on-site management;
- Projected the savings associated with the shift to on-site management; and
- Estimated the cost savings associated shifts to in-situ treatment.

Exhibit 2-2 shows this methodology graphically.

Exhibit 2-2: Methodology for Estimating Cost Savings at State Superfund and Voluntary Cleanup Sites



Size of State Superfund and Voluntary Cleanup Programs

The initial step of estimating the savings associated with RAPs for sites cleaned up under state superfund and voluntary cleanup programs was to estimate the total number of such sites. The EPA report, *Application of the Phase IV Land Disposal Restrictions to Contaminated Media: Costs, Cost Savings, and Economic Impacts*

(hereafter called the Phase IV Contaminated Media EA), projects that approximately 1,340 contaminated sites will be cleaned up each year (for the next five years) under state superfund or voluntary cleanup programs. EPA arrived at this estimate by using the "Analysis of State Superfund Programs: 50-State Study, 1995 Update" and expert judgment elicitation.[3] Furthermore, the Agency estimated that each site will generate an average of 500 tons of contaminated soil and insignificant amounts of hazardous sediments.[4] To verify the per site average of 500 tons of contaminated soil, EPA analyzed the tonnage of contaminated soil reported to the 1995 Biennial Reporting System (BRS) by facilities believed to be state superfund and voluntary cleanup sites (i.e., generators of contaminated soil (BRS form codes B301 and B302) at non-RCRA/CERCLA/UST sites (BRS source code A69). The estimate of 500 tons was accurate to within 10 percent of the tonnages reported to the BRS.

While RAPs apply to all types of remediation waste, this analysis focuses on contaminated soil because previous analyses showed that hazardous sediments were rarely generated in volumes sufficient to justify on-site management at state superfund and voluntary sites and because few data are available on volumes of hazardous remediation debris and sludges. EPA, however, expects that the nature of debris will prevent it from recognizing significant savings from a shift to in-situ treatment. Debris is most amenable to ex-situ treatment technologies; it is difficult to treat materials such as metal, glass, rubber, concrete, or cloth in situ. To the extent that hazardous remediation debris and sludges are generated at state superfund and voluntary cleanup sites and can recognize savings from avoided transportation and from a shift to in-situ treatment, this analysis underestimates the savings of the RAP provisions.

Finally, groundwater is typically treated on site because of the cost, logistical limitations, and other difficulties of transporting and treating large volumes of liquid wastes off site. EPA does not expect that significant amounts of groundwater will shift from off-site to on-site treatment under RAPs. Thus, contaminated groundwater generated at state superfund and voluntary cleanup sites is not expected to recognize significant savings from RAPs and it is not discussed further in this analysis.

Sites Potentially Affected by the RAP Provisions

RAPs will enable sites cleaning up under state superfund and voluntary programs to treat their hazardous remediation waste on site without obtaining a RCRA

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[3] Environmental Law Institute, December 1995. For more information about how these estimates were developed, please see page 2-30 of the *Application of the Phase IV Land Disposal Restrictions to Contaminated Media: Costs, Cost Savings, and Economic Impacts*, U.S. EPA, Office of Solid Waste, February 1998.

[4] *Application of the Phase IV Land Disposal Restrictions to Contaminated Media: Costs, Cost Savings, and Economic* Impacts.

permit or assuming facility-wide corrective action liability. As explained earlier, however, contaminated sites located in states with RCRA permit waiver authority already have the option to manage their waste on site without obtaining a RCRA permit. Thus, the only sites potentially recognizing significant savings are sites located in states without permit waiver authority.

Based on the input of state and EPA corrective action experts, the Agency estimates that approximately 10 to 50 percent of existing contaminated sites are located in states without RCRA permit waiver authority. Thus, approximately 130 to 660 of the 1,340 sites cleaned up each year under state superfund and voluntary programs are estimated to be located in states without RCRA permit variance authority.

Volumes Switching from Off-Site to On-Site Management

Under the current requirements, EPA assumes that the 130 to 660 sites potentially affected by RAP provisions excavate their remediation waste and ship it off site for treatment and disposal. Assuming that each site generates an average of approximately 500 tons of hazardous contaminated soil, as noted earlier, the volume of hazardous soil generated at these sites ranges from 65,000 to 330,000 tons. Under RAP provisions, a portion of these sites are expected to switch to on-site treatment and disposal, as discussed above. This section describes how EPA estimated the number of sites and volumes of contaminated soil shifting to on-site management. Because of the lack of available data on such potential shifts, EPA relied on the professional judgments of experienced state and EPA corrective action program staff.

State and EPA corrective action experts estimated that only about five to 10 percent of the 130 to 660 contaminated sites, potentially affected by this rule annually, or seven to 66 sites per year, will switch to on-site management because:

- Off-site management will remain the least expensive and simplest option for many sites, particularly small-volume and other sites where on-site treatment and disposal is not economically feasible;

- Contaminated soil for which combustion is the preferred treatment option will likely still be sent off-site because combustion will not be allowed under a RAP, as required by Section 270.68(b)(3);[5]

- Potential community opposition;

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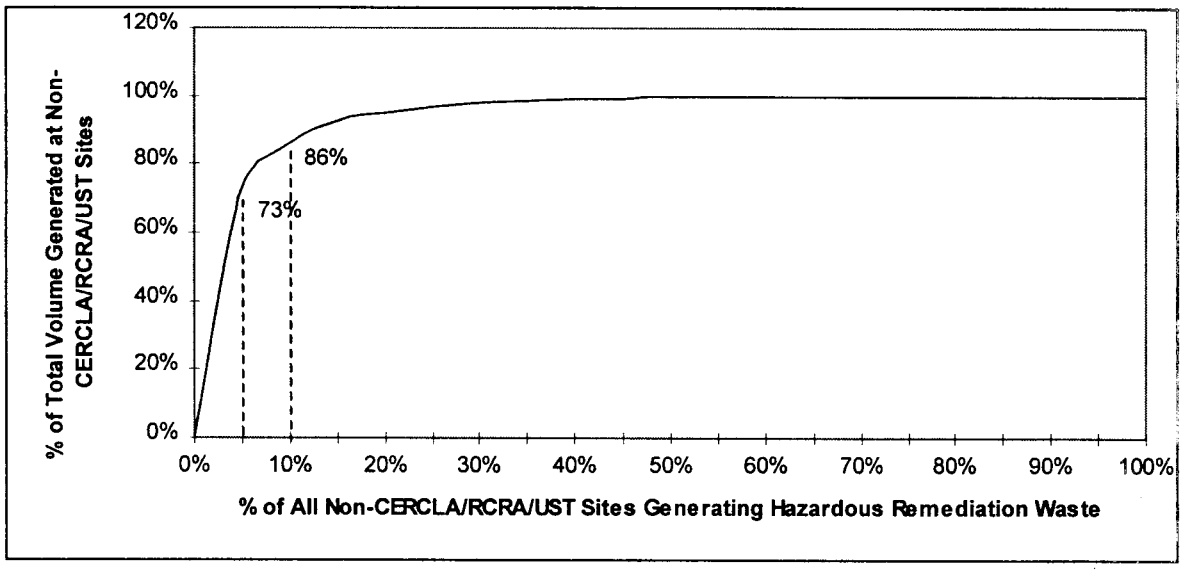
[5] Those contaminated soils for which combustion is estimated to be the preferred treatment option are generally low volume/highly contaminated soils. Therefore, while viable alternatives to combustion exist for on-site management, it is likely that those alternatives would not be cost effective given the small size of the volumes being combusted. Thus, off-site combustion of these soils is likely to continue.

- The risk of liability for damages from residuals remaining on site;
- The ability to put the site to a higher-valued use if the contamination is removed; and
- Uncertainties of predicting on-site treatment costs.

The sites that are expected to switch to on-site management are anticipated to be the highest volume sites. On-site treatment is most likely to be economically feasible at high-volume sites due to economies of scale, where the startup cost of building on-site treatment systems can be offset by a higher volume of soil to be treated.

To estimate the quantity of soil generated at these highest volume sites expected to switch to on-site management, EPA used data from the 1995 Biennial Reporting System (BRS) on six-hundred and seventy two facilities that reported the generation of contaminated soil (BRS form codes B301 and B302) at non-RCRA/CERCLA/UST sites (source code A69, assumed to be state superfund and voluntary cleanup sites).[6] The volumes generated at these sites are shown in Exhibit 2-3. The five to 10 percent of sites (or 34 to 67 facilities) reporting the highest

Exhibit 2-3: Contaminated Soil Volumes Generated at Non-CERCLA/RCRA/UST Sites Reporting to the 1995 BRS



volumes in the 1995 BRS generated between 73 and 86 percent of all of the hazard soils at non-RCRA/CERCLA/UST sites. Applying this percentage range to the 65

[6] Wastes generated at remedial activities at underground storage tanks (USTs) were excluded because a separate RCRA Subtitle I programs specifically addresses USTs.

to 330,000 tons generated at sites potentially affected by RAP provisions results in a range of 50,000 to 280,000 tons of contaminated soil switching to on-site management (0.73 x 65,000 to 0.86 x 330,000).

Assuming that the sites that will switch from off-site to on-site management are the highest volume sites likely overestimates the average volume generated at sites expected to switch. While higher volume sites will more frequently switch than low volume sites, the actual volume at which on-site management becomes economically feasible depends on various factors, such as the composition of the remediation waste and site-specific characteristics. Thus, for some types of remediation wastes, on-site management will likely be used for volumes significantly lower than those estimated by this analysis. Nevertheless, because the largest sites will most likely to switch to on-site management, the Agency believes that this approach is reasonable. To the extent that the analysis overestimates the volume generated at sites switching from off-site to on-site management, the overall cost savings of the rule will be overestimated.

Transportation Cost Savings From the Shift from Off-Site to On-Site Treatment

Volumes of remediation waste switching from off-site to on-site management will no longer have to be transported for treatment and disposal. Thus, site owners and operators will avoid waste transportation costs. To project these savings based on the distance to off-site commercial facilities, EPA modeled the distance from each non-CERCLA/RCRA/UST generator of remediation waste reporting to the 1995 BRS to the destination facility using BRS and U.S. Bureau of Census data. The remainder of the section describes the model.

For each of the 672 facilities reporting the generation of remediation waste at non-CERCLA/RCRA/UST sites, EPA used the zip codes reported in the BRS for both the generating facility and the receiving facility to approximate the locations of both facilities. If the zip code was unavailable in BRS, the Agency used the facility zip code in RCRIS, which was identified using the facility EPA identification number. If no zip code was found in RCRIS, EPA used the county in which the facility was located. For facilities reporting no zip code or county, transport distances were not calculated.

To estimate the distance between the generator and the receiving facility, EPA determined the approximate latitude and longitude of the center of each zip code or county reported by both the generation and receiving facilities and estimated the distance between the two locations using a model designed specifically to calculate such distances. U.S. Bureau of Census TIGER files were used to obtain latitude and longitude data. Exhibit 2-4 shows these transport distances reported for facilities