

US EPA ARCHIVE DOCUMENT

**RE-ENGINEERING RCRA FOR RECYCLING
DEFINITION OF SOLID WASTE TASK FORCE:
REPORT AND RECOMMENDATIONS**

**U.S. Environmental Protection Agency
Office of Solid Waste**

ACKNOWLEDGMENTS

This report was prepared by the Definition of Solid Waste Task Force, an internal Agency group with the following members:

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Although we received advice from many different individuals and groups from both inside and outside the Agency, these recommendations are our opinions and not necessarily those of EPA management or other staff. To reach our conclusions and recommendations, we worked very closely with the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and its Definition of Solid Waste Workgroup. We wish to thank everyone who helped us in this effort, but especially the ASTSWMO members. We are also grateful for the assistance of Ms. Nancy Bacon Brown, a former Task Force member.

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EXECUTIVE SUMMARY

THE DEFINITION OF SOLID WASTE TASK FORCE

This report presents the recommendations of the Definition of Solid Waste Task Force. The Task Force was established in October 1992 by the Director of the Office of Solid Waste to address concerns about the current solid waste definition and how it affects waste recycling.

The Environmental Protection Agency (EPA) has promulgated regulations under the Resource Conservation and Recovery Act (RCRA) that set forth extensive responsibilities for managing certain wastes. To be subject to these responsibilities, a material must generally be defined as both a solid and a hazardous waste (hazardous wastes are a subset of solid wastes). Whether a material is a solid waste, therefore, has enormous implications for the person who generates and handles it. In turn, recycling a material can affect whether it is defined as a solid waste under the RCRA regulations.

RCRA has two principal goals: (1) protecting human health and the environment and (2) reducing waste and conserving energy and natural resources. EPA's highest priority for conservation is the reduction of pollutants at their source. However, source reduction is not always technically possible or economically practical. In such cases, EPA recommends recycling waste, including hazardous waste. Many businesses find that recycling their waste makes good economic as well as environmental sense. It can conserve our virgin resources, and save time and money as well.

At the same time, unsafe recycling of hazardous waste has sometimes harmed public health and the environment. Problems with unsafe recycling have created a public demand for oversight of this activity. In particular, the environmental community believes that EPA's hazardous waste recycling regulations create loopholes that increase the likelihood of unsafe or illegitimate recycling.

Many people in industry, on the other hand, believe that EPA's hazardous waste regulations discourage the safe recycling of hazardous waste, and increase the likelihood that waste will be disposed of instead of beneficially reused. They argue that the regulations impose costs that can make recycling less profitable than disposal.

Other interested parties, such as State regulatory agencies, have asserted that EPA's hazardous waste recycling regulations are too difficult to understand, enforce, and implement. In addition, many people have pointed out that the regulations seem to be "all or nothing" - that is, recyclers are generally subject to most RCRA responsibilities, or to virtually none. They argue that a more reasonable approach would tailor management requirements to the risks involved in different types of recycling.

The Definition of Solid Waste Task Force was formed to recommend solutions to these concerns. The Task Force has three principal goals:

- o Eliminate disincentives for the safe recycling of hazardous waste;
- o Eliminate regulatory loopholes for recycling that create risks to human health and the environment;
- o Clarify and, if possible, simplify the definition of solid waste.

Through the Association of State and Territorial Solid Waste Management Officials, the Task Force asked State representatives to help us develop a workable plan to deal with hazardous waste recycling. We established a core group of State personnel whom we consulted at all stages in developing our recommendations.

We also conducted extensive meetings with individuals from industry and the environmental community. To get the best technical comments available, we formed a Definition of Solid Waste Roundtable, consisting of sixteen experts in the field of hazardous waste management and recycling. The Roundtable members provided the Task Force and the States with invaluable expertise in evaluating new options for change.

We realize that all of our recommended changes may not be achievable under the current statute. We will evaluate whether our suggested revisions can be implemented under current law, or whether legislative changes would be needed. We also emphasize that the recommendations in this report represent only the opinions of the Task Force members and are not necessarily shared by other EPA personnel. The purpose of this report is to provide specific recommendations for the consideration of senior EPA management.

TASK FORCE RECOMMENDATIONS

The principal recommendation in this report is a proposed new recycling system that recognizes both the public's need for protection of human health and the environment and industry's need for a system in which recycling can compete fairly in the marketplace. The proposed new system is based upon the following principles:

Use of equipment designed to prevent releases to the environment, especially groundwater.

Quick and effective response to releases that occur despite preventive measures.

Sufficient knowledge by government regulators about recycling facilities to enforce compliance with the management standards.

Safe transportation and tracking of recyclable materials.

Waste-derived products that pose no more threat to human health and the environment than the virgin products they replace or compete with.

Notification of the surrounding community if the recycler will be recycling hazardous waste generated at another facility.

Under the current regulations, recycling facilities are generally subject either to very few controls or to the full panoply of hazardous waste management requirements. Our proposal would replace this scheme with different levels of control for different types of facilities. Our scheme has three broad classes of recycling. The first class is RCRA Recycling (covered by our proposed tailored controls). The second class is recycling which would remain or become exempt from RCRA regulation (RCRA-Exempt/Excluded). The third class is recycling which would remain subject to full Subtitle C requirements (RCRA Hazardous Waste Recycling). These three classes are described in order below.

RCRA RECYCLING

New Classification Scheme

Our recommended new system divides RCRA recycling into the following categories based on the source of the recyclable materials and the recycling location:

Category A: Direct reuse off-site of spent materials and recovery of precious metals.

Category B: On-site recycling. Recycling secondary materials at the manufacturing facility that generated the materials.

Category C: Captive (intracompany) recycling and product stewardship. "Captive recycling" means recycling secondary materials at a facility owned by the same company that generated the materials, but at a different location. "Product stewardship" means recycling used products returned to manufacturers by their customers.

Category D: Commercial recycling (off-site): Recycling secondary materials by a facility unrelated to the generating facility and located at a different site. No product stewardship relation exists.

RCRA Recycling Requirements

Recyclers within each category must comply with waste management requirements tailored to address the differences among the categories. Some requirements apply to all of the categories, and many apply to three of the four categories. Except for the notification and reporting requirement, which is new only for Category A, the requirements resemble those currently existing for all four categories. Some requirements are less stringent than the existing standards, some are more stringent.

Our suggested management requirements respond to important industry, State, and environmental concerns about the current regulation of recycling. The concern most frequently voiced by industry is the nature of the RCRA permitting process. Industry representatives reported that the delays and uncertainties involved in obtaining a RCRA permit significantly discourage hazardous waste recycling. Responding quickly to changes in demand and other market conditions is complicated by uncertainty about the timing, extent, and costs of the regulatory controls that are eventually determined to be applicable. We believe that our clarified requirements address industry's concerns without sacrificing sound environmental management.

Key Recommendations for All Recycling Categories

o **Recommendation #1: Speculative accumulation is prohibited.**

Currently, RCRA allows accumulation for 12 to 24 months (depending on the calendar month accumulation begins) at any facility storing exempt materials. RCRA also generally requires a permit for any off-site storage of regulated wastes and for on-site storage that exceeds 90 days. The Task Force recommends allowing secondary materials to be accumulated for 18 months on-site and 12 months off-site before a hazardous waste storage permit is required. We recommend 18 months accumulation for on-site recyclers to allow them more time to reuse their secondary materials in the most compatible product.

o **Recommendation #2: State/EPA notification and biennial reporting is required.**

The recycler would file a one-time notice, giving the location of the recycling facility and the type and quantity of wastes recycled. The reporting requirements for hazardous waste generated (currently applicable to Categories B-D) would be extended to Category A.

o Recommendation #3: Land storage is prohibited.

We recommend expanding the current prohibition against use constituting disposal to include **storage** before recycling in surface impoundments or waste piles. In our proposed new system, the materials must be stored in tanks, containers, or containment buildings. This change is a logical extension of the Agency's concerns about the potential environmental risks of land placement.

o Recommendation #4: Recyclable materials manifest is required for off-site shipments.

A new manifest for RCRA recyclable materials would accompany off-site shipments. It would resemble the current hazardous waste manifest for these materials, but could result in the elimination of stringent State requirements attached to use of that manifest. The new manifest would respond to industry concerns about the transportation costs associated with the current manifest, and about the stigma associated with transporting hazardous recyclables, even when the environmental risk is minimal.

o Recommendation #5: No "toxics along for the ride" are allowed.

This requirement responds to concerns of the environmental community that EPA does not regulate most hazardous waste-derived products. We recommend that most recycling meet objective criteria that establish the recycling as legitimate. Recyclers would certify compliance, but States or EPA Regions could request more specific data if they believed that the products in question introduced significant new risks into the marketplace. A method for determining legitimacy could be the comparison of recycled products to their virgin material counterparts to ascertain whether they contain significantly higher levels of hazardous constituents ("toxics along for the ride," or "TAR" test). Variances would be available under certain circumstances. When objective criteria are developed, they will clarify existing policy. We are considering several options to reduce the overall cost of complying with this requirement.

Key Recommendations for RCRA Recycling Categories B, C, and D

The following management requirements are recommended for recycling units in Categories B, C, and D. Most of these are already required for recycling facilities that must obtain a storage permit, but the recycling unit itself is currently exempt. Under our plan, recycling units would be regulated as described below.

o Recommendation #6: Eliminate requirement for a full RCRA permit.

We recommend that full RCRA permits be replaced by certain management standards, discussed in the remainder of these recommendations. In lieu of applying for and obtaining a permit, facilities would certify compliance with all applicable conditions.

o Recommendation #7: Tank, container, and containment building management standards.

This requirement would emphasize secondary containment by requiring RCRA management standards for tanks, containers, and containment buildings.

o Recommendation #8: Clean Air Act requirements in lieu of RCRA air emission requirements.

In an effort to reduce regulatory redundancy, we recommend that Clean Air Act (CAA) requirements be adopted for regulating air emissions. RCRA air emission requirements would apply only if Clean Air Act standards did not apply or if the CAA standards were less stringent.

o Recommendation #9: Unit release response rather than facility-wide corrective action.

We recommend adopting for recycling units the RCRA requirements for responding to releases from tank systems. Other effective Federal and State cleanup authorities would address existing releases beyond the unit boundary. Existing facilities already subject to corrective action would remain subject to those obligations.

o Recommendation #10: Facility modifications to be reported in the Biennial Report.

Except for major modifications at Category D facilities, no facility modification would need prior approval; they would be transmitted in the Biennial Report.

o Recommendation #11: Closure and financial assurance for closure.

The Task Force recommends that facilities submit a financial assurance estimate for clean closing their recycling management units. The estimate would be submitted at the time of the compliance certification. Closure plans would be submitted at the time of closure. We also recommend that EPA develop guidance for closure based on the historical cost of closing different kinds of facilities.

o Recommendation #12: Public notice for large Category C facilities.

We recommend that Category C facilities recycling more than 12,000 kilograms per year give 30 days public notice of hazardous waste shipments received from off-site. Citizens would be free to review nonproprietary material.

o Recommendation #13: Operations plan.

We recommend that facilities submit an operations plan consisting of a waste analysis plan and a description of how they intend to handle and manage secondary materials.

Key Recommendation for Category D Only

For Category D (off-site commercial recycling) **all** of the above requirements apply, with one additional requirement. This is:

o Recommendation #14: Prior government approval.

We recommend that Category D facilities obtain government approval (with full public participation) for their operations plan, secondary containment, financial assurance estimates, and

major modifications. This approval would be required before recycling operations could begin. Prior approval of TAR tests would also be required if the State or EPA requested it.

RCRA EXEMPT/EXCLUDED

This is the second broad class of recycling activities. Below are our recommended changes to the existing exemptions and exclusions. We believe that these suggested changes will protect human health and the environment while encouraging greater reuse of materials and energy.

New Exemptions

We recommend three new exemptions involving fuel use. We are also considering another exemption for incidental processing.

- o **Recommendation #1: Allow direct reuse of secondary materials containing hydrocarbons in thermal processes at petroleum refineries or petrochemical plants.**
- o **Recommendation #2: Allow direct reuse of secondary materials containing hydrocarbons when returned for blending into commercial-grade gasoline at a petroleum refinery.**

The current direct-reuse exemption does not allow recycled materials to be used as fuels. However, adding secondary materials to standard commercial fuel production processes or gasoline-blending operations at petroleum refineries more closely parallels chemical production than blending hazardous wastes for direct combustion at other industrial facilities. This is because the secondary hydrocarbon-bearing materials are compatible with petroleum refining and blending processes designed to produce high-specification fuels.

- o **Recommendation #3: Allow recovery of energy from "clean" waste-derived fuels (e.g., ethanol, methanol, hexane).**

This exemption responds to suggestions that materials that burn "cleanly" because of low levels of hazardous constituents should not be regulated as hazardous wastes, even if burned as fuels. We plan to define fuels that are "clean" in the future; an example would be any fuel that is low in toxic metals and halogens, and that is hazardous only because of ignitability.

- o **Recommendation #4: Allow recycling that involves only simple, low-risk processes (incidental processing).**

Current EPA regulations do not allow most exempt materials to be reclaimed before reuse. Industry believes that the current definition of "reclamation" (processing to recover a usable product, or regeneration) is too broad. The term encompasses such activities as simple filtering, screening, sorting, and grinding, which industry believes are incidental to most normal manufacturing processes, rather than being confined to recycling. Therefore, we recommend exempting recycling that involves only simple, low-risk processes, if other management requirements are met (e.g., use of RCRA tanks or containment buildings).

Exemptions Eliminated

We recommend regulating two currently unregulated activities:

o **Recommendation #5: Regulate direct reuse (without reclamation) of spent materials sent off-site.**

Some States expressed concern about lack of regulatory control over spent material transported off-site due to tracking and spill problems. Including direct reuse of spent materials off-site in the "RCRA Recycling" class (Category A) will address the current lack of controls on the transportation of these materials. Because this activity so closely resembles manufacturing, we are not recommending the management standards we recommend for other types of recycling.

o **Recommendation #6: Regulate characteristic sludges (emissions control residues).**

Current regulations exempt characteristic sludges (those which exhibit a hazardous waste characteristic) if they are reclaimed. The Agency exempted them because of the difficulty of developing a standard for distinguishing between reclamation of product-like sludges and reclamation of waste-like sludges. Environmental groups and some States have expressed concern about this exemption, believing that there is no reason these materials should not be treated as solid wastes.

The Task Force and the States believe that *most* sludges should be classified as wastes rather than products, since they are a result of treatment processes and normally resemble other waste-like materials. They also are defined as "solid waste" in the statutory definition. We recommend defining some kinds of emission-control residues as intermediate products in the primary metals industry if they have a sufficiently high metals content to make them consistently valuable as commodities.

New Criteria for Exemption

Following are suggested criteria for most RCRA Exempt/Excluded activities. The Task Force believes that the modifications suggested below will prevent the activities from becoming part of the waste disposal problem.

o **Recommendation #7: Facilities must determine their status under RCRA.**

Currently, EPA does not require a status determination for exempt facilities, except in the context of an enforcement action. The Task Force recommends requiring an exempt recycler to keep on file a brief document that states the grounds for the claimed exemption or exclusion. The document would be available for inspection if questions arose about the regulatory status of the facility under RCRA.

o **Recommendation #8: Facilities must notify EPA or the State.**

Because States do not currently receive information about many recycling facilities, they are unable to ascertain whether a facility's claimed exemption is justified. We recommend that most exempt categories of recyclers be required to notify the State or EPA of those currently exempt recycling activities (including storage) and the grounds for the claimed exemption.

o **Recommendation #9: Speculative accumulation is prohibited.**

This is the same as the criterion for the RCRA Recycling class, described above in Recommendation #1.

o Recommendation #10: No land storage.

This requirement is the same as that described above for RCRA Recycling in Recommendation #3.

RCRA HAZARDOUS WASTE RECYCLING: FULL SUBTITLE C

The final class of recycling is subject to full Subtitle C hazardous waste requirements. This class includes:

Recycling of used oil (current rules unchanged).

Recycling of inherently waste-like materials (dioxins and certain materials fed to halogen-acid furnaces).

Waste-derived products containing TARs (or secondary materials containing TARs if the recycler prefers to measure toxics in ingredients).

Storage for recycling in excess of the speculative accumulation limits.

Recycling that involves landfilling, land storage, or burning for destruction.

The Task Force and the States believe that these activities and materials should be subject to full Subtitle C controls because they pose a significant potential for harm to human health and the environment. Furthermore, those regulatory controls give generators an appropriate economic incentive for considering alternative practices more consistent with the goals of RCRA. For used oil recycling, we believe the Agency has already established an alternative regulatory program consistent with those goals.

STATE IMPLEMENTATION

The Task Force recommends that States should have maximum flexibility and latitude to implement the new recycling program. They should have the opportunity to develop requirements that are different from federal rules if, on balance, the same degree of environmental protection is attained.

To bring about this flexibility, we believe that any necessary State authorization applications should be evaluated by EPA to ascertain whether the entire recycling program achieves environmental results similar to the EPA program, rather than comparing each component of the State program to its federal counterpart.

We also believe that States should have the flexibility to demonstrate that alternative State requirements are as environmentally protective as EPA requirements. For example, a State may choose to work with a facility to identify less burdensome ways to prevent groundwater contamination, such as alternative frequencies of inspections or groundwater monitoring. In return, the State could choose to require more stringent design or operating procedures in other areas. We believe that EPA should work with the States to identify potential "trade-off" requirements.

States also should be able to make the final decision about which recycling category a facility is in, or whether a facility is exempt. This flexibility is particularly useful in situations

where it is hard to distinguish continuous manufacturing from waste recycling. We believe that this will speed State decisionmaking, since States currently must be concerned about issues that may be raised by EPA.

Finally, States should be able to take into account the ease or difficulty of retrofitting existing facilities or units (such as recycling units) that were previously exempt under the RCRA regulations but that would be regulated under our proposed scheme. The Agency can work with the States to identify alternative requirements that ensure protection of human health and the environment.

POTENTIAL IMPACT OF OUR NEW RECYCLING SCHEME

Available data suggest that significant opportunities exist for recycling additional amounts of hazardous waste. In 1991, industry reported recycling only 2 percent of the wastes they generated (exempt wastes and RCRA wastes). It is true that many wastestreams are not amenable to recycling. However, when the wastestreams most frequently recycled are examined, it is apparent that almost 10,000 generators are not recycling an estimated 113 million tons of hazardous waste most amenable to recycling. Only 5 percent of the most commonly reported recyclable wastestreams are actually being recycled.

Similarly, available data suggest that two clusters of hazardous waste generators exist - a small number of very large generators and a large number of small to medium size firms. The smaller the generator, the higher the probability that the waste will not be handled on-site, and that it will be sent off-site for treatment and disposal. We believe that additional opportunities exist for the smaller generators to conduct either on-site or off-site recycling.

The proposed new recycling system will eliminate disincentives for the **safe** recycling of hazardous waste that is today treated and disposed of. We have recommended reducing some regulatory requirements because we believe they over-regulate recycling. For example, permits would no longer be required for RCRA recycling units, the uniform hazardous waste manifest would no longer be required for shipping recyclable materials, and most facility modifications would no longer need prior approval.

We also believe that the loopholes closed by this approach are just as important as the disincentives removed. We have recommended tighter requirements in some areas where we believe safe recycling could be jeopardized. Examples are notification to States of exempt activities, prohibition of land storage before recycling, and elimination of the recycling unit exemption. If the limited increases in oversight that we have recommended would disqualify much recycling that currently takes place, we would be forced to doubt the benefits of such recycling.

On balance, we believe that our system will increase both the quantity of waste recycled and the number of recyclers, particularly if the States are allowed flexibility and latitude to implement the program. The new approach could also encourage firms to incorporate recyclability into their process and product designs, since under product stewardship more of their spent or used products could be returned for reprocessing.

In the final analysis, the new recycling system will require us to manage change effectively. Although the recommended plan is not without its critics, we believe that our scheme is the right starting point for triggering reform of the regulations governing hazardous waste recycling. Interacting with interested parties in refining the system should produce further gains in effectiveness. We hope to work with these parties to test and validate all parts of our

system, and to provide industry and the States with guidance and user-friendly implementation tools. This cooperation is essential to avoid confusion and disruption.

If our plan encourages more safe recycling, we can improve the environment and save resources at the same time. In the end, what could be more important?

CHAPTER 1

WHY REENGINEER RCRA?

Surveys consistently show that Americans are troubled about hazardous waste, especially in landfills.¹ If hazardous materials and energy can be used again in manufacturing instead of disposed of as waste, they are less likely to pollute the environment or harm public health. Reuse also conserves virgin materials and can save time and money. However, **unsafe** recycling practices have sometimes brought about significant environmental harm, as documented by the Environmental Protection Agency (EPA). This report recommends ways for EPA to encourage recycling, while still protecting our environment.²

HOW RCRA WAS BORN

The American public was not seriously worried about the environment until several notorious incidents of air and water pollution occurred in the 1960s. For example, in December 1962, the "Killer Smog" engulfed London, killing at least 340 people; 200 deaths were attributed to a similar incident in New York City in November 1963. Major water pollution accidents also occurred — the Cuyahoga River in Ohio once caught fire from a toxic spill. In 1970, Congress passed legislation creating the U.S. Environmental Protection Agency. At first, resources were concentrated on improving air and water quality. By the end of the 1970s, the air in our major cities had improved significantly, and many rivers and lakes began to show new signs of life.

Compared with these acute air and water quality problems, the dangers of hazardous waste and its effects on soil and groundwater were not readily apparent. Although Congress originally enacted the Solid Waste Disposal Act (SWDA) in 1965, that statute only addressed the problems of municipal solid waste (garbage). It emphasized nonhazardous rather than hazardous wastes, and also focused on planning rather than on resolving environmental problems from land disposal. Congress amended the SWDA in 1976 with the Resource Conservation and Recovery Act (RCRA) to regulate hazardous waste generators, transporters, and management facilities. Even with the amendments, however, the statute still emphasized the regulation of municipal (nonhazardous) wastes.

As Congress and EPA strengthened air and water laws, land disposal, which was largely unregulated, appeared to be an inexpensive alternative. Pollution steadily shifted from air and surface water to soil and groundwater. Well-publicized catastrophes like Valley of the Drums and Love Canal finally brought attention to the dangers of hazardous waste land disposal. As harmful health effects from soil and groundwater contamination appeared, Congress viewed hazardous waste as the "last big loophole in environmental law." This public and political awareness provided the impetus for new laws to clean up abandoned waste sites and to prevent further uncontrolled dumping of industrial waste.

¹U.S. EPA, *The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study ("RIS")*, at 5 (July 1990). See also, *Roper Reports*, 90-1, 59, 90-2, 2-27; 90-8, 30-33; 92-4, 36-39; 92-9, 20-20-21.

² 50 *Fed. Reg.* 614, 659 (Appendix A) (January 4, 1985) and U.S. EPA, *RCRA Implementation Study Update: The Definition of Solid Waste ("RIS Update")*, Appendix C (July 1992).

First, Congress created Superfund³ to clean up old contaminated sites. Because Superfund did not include preventive measures, however, Congress amended RCRA with the Hazardous and Solid Waste Amendments of 1984 (HSWA). HSWA prohibited the land disposal of hazardous waste without pretreatment and mandated cleanup as a RCRA permit requirement. Thus, RCRA became a "cradle-to-grave" system for managing hazardous waste from generation to disposal and cleanup. This program, contained in Subtitle C of RCRA, is generally called the "Subtitle C program" (for hazardous waste) to distinguish it from the "Subtitle D program" (for nonhazardous waste). This report concerns only the Subtitle C program.

WHY IS RCRA SO DIFFICULT?

Since their enactment in 1965, SDWA and RCRA have ranked among the most complex and expensive regulatory programs in the United States. In 1993, industry, states, and EPA spent \$10.4 billion implementing RCRA Subtitle C requirements.⁴ This included a universe of approximately 24,000 large-quantity generators and 175,000 small-quantity generators. Up to one-third of the 130,000 calls received each year by the RCRA Hotline concern the definitions of solid or hazardous waste.⁵

Several factors contribute to RCRA's current complexity. One factor is competing objectives within the statute itself. RCRA's primary goals are: (1) to protect human health and the environment, and (2) to reduce waste and conserve energy and natural resources. There is an inevitable tension between these goals, because the most effective measures for protecting human health and the environment are likely to be expensive and do not automatically foster resource conservation. Some parties believe that **any** activity involving hazardous wastes should be subjected to the same strict controls that apply to landfill disposal. Strict controls may cause hazardous waste recycling to be as expensive as disposal. Manufacturers using secondary materials then find it difficult to compete with facilities using virgin materials, which are not as strictly regulated. They therefore choose instead to dispose of the material.

The nature of EPA's jurisdiction over hazardous waste also contributes to the program's complexity. The statute authorizes EPA to regulate hazardous waste as a subset of solid waste. A waste must first be a solid waste before it can be defined and regulated as a hazardous waste. The statute defines "solid waste" as "any garbage, refuse, sludge . . . and other discarded material . . . resulting from commercial, mining, and agricultural operations, and from community activities . . ." (42 U.S.C. § 1004(27)). Congress used very general terms ("discarded material") in the statute and did not specifically mention recycling. Therefore, instead of basing decisions on whether a material poses a risk to human health and the environment, EPA must also try to determine whether a material is "discarded." This makes it difficult to set regulatory priorities and to draft regulatory language. As a result, RCRA has evolved into a regulatory scheme that is difficult to understand and that sometimes under-regulates or over-regulates different types of

³Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601 *et seq.* (1980).

⁴Based on figures in *U.S. EPA, Environmental Investments: The Cost of a Clean Environment*, Table 5-3A (November 1990), adjusted to 1993 dollars.

⁵All Hotline statistics based on Monthly Hotline Reports for 1991 through 1993 and 1991 and 1992 annual reports.

recycling. Debate continues over EPA's authority to regulate some kinds of hazardous waste recycling.

THE DEFINITION OF SOLID WASTE TASK FORCE

Because so many questions about RCRA concern recycling, even small improvements to the recycling regulations could clarify these issues for everybody concerned. In October 1992, EPA's Definition of Solid Waste Task Force was formed as part of the effort to improve EPA's recycling program. The Task Force was so named because recycling a material may affect whether it is defined as a solid waste and regulated under RCRA.

The Task Force is a small internal Agency group reporting to the Director of the Office of Solid Waste. The Director charged the Task Force with three primary goals consistent with the statutory mandate to protect human health and the environment. These goals are:

Eliminate disincentives for the safe recycling of hazardous waste;

Correct under-regulation of recycling in the current regulations to ensure protection of human health and the environment;

Clarify and, if possible, simplify the applicable regulations.

The Task Force is charged with finding the best ways to carry out these goals, even if its recommendations are not achievable under the current statute. If the most practical, protective, and economically feasible recycling system is not consistent with the statute, then the Agency must consider asking Congress to enact legislation to implement the system.

To develop recommendations responding to the concerns of all affected parties, the Task Force met with industry groups, the environmental community, and State associations. We visited manufacturing, recycling, and waste management facilities, and solicited written comments and suggestions. We also held a large public forum where constituents could discuss broad options for change.

The Task Force then convened a dialogue group ("the Roundtable") to solicit opinions from experts in hazardous waste management. We met with a core group of State personnel acting through the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) to develop a straw proposal designed to spark discussion among the Roundtable members. Because any successful recommendations must have the support of most States, they have participated at all stages of this initiative as co-regulators.

This report describes the Task Force's conclusions and recommendations. These recommendations come from our evaluation of the ideas received from everyone we met or spoke with, or from whom we received written comments.⁶ We recognize that all the changes may not be achievable under the current statute, and we are interested in comments about whether our suggested revisions can be implemented under current law, or whether legislative changes would be needed. Our recommendations do not alter current Agency policy, although we are advising EPA's management to use the recommendations as a starting point to develop a

⁶Any written information, including Task Force/State proposals, discussion documents, and public comments, have been placed in the EPA RCRA docket.

new regulation. We hope that this report stimulates further discussion of the issues and elicits suggestions for improving our recommended system.

CHAPTER 2

THE CURRENT SYSTEM

DEFINITION OF "SOLID WASTE"

Subtitle C of RCRA states that solid wastes are "discarded" materials. EPA's regulations specify that materials may be considered "discarded" if they are "abandoned," "recycled," or "inherently waste-like." Some materials are expressly excluded from the definition of "solid waste" and, therefore, are not subject to RCRA Subtitle C requirements. Examples (which appear in 40 C.F.R. § 261.4(a)), include:

Domestic sewage and mixtures of domestic sewage and other wastes discharged to a publicly owned treatment works;

Discharges regulated under the National Pollution Discharge Elimination System;

"Closed-loop" recycling in a totally enclosed system with piping and tanks.

RECYCLING SOLID WASTE: WHEN IS IT REGULATED?

Materials that are potentially solid and hazardous wastes are usually referred to collectively as "secondary materials," although the term does not appear in the statute or regulations. EPA currently regulates the recycling of four kinds of secondary materials:

A **spent material** is a material that has been used and, as a result of contamination, can no longer serve the purpose for which it was produced without processing.

A **sludge** is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility (exclusive of treated effluent from a wastewater treatment plant).

A **by-product** is a material that is not one of the primary products of a production process and is not solely or separately produced by the production process.

Commercial chemical products are chemicals manufactured or formulated for commercial or manufacturing use. EPA lists them as "P" and "U" wastes and regulates their recycling only under certain circumstances.

Whether EPA regulates recycling depends on the nature of the material and how it is recycled. Generally, EPA regulates materials and processes that resemble hazardous wastes and their management more closely than they resemble products and manufacturing. Consistent with this philosophy, EPA almost always defines materials as solid wastes if they are:

Burned for energy recovery or used to produce a fuel;

Used in a manner constituting disposal (placing recycled material directly on the land, even after it is incorporated with other materials);

Accumulated speculatively (accumulating otherwise exempt secondary materials longer than allowed by the regulations).

A fourth kind of recycling — reclamation — is regulated under some circumstances and not others. Reclamation is the processing of a secondary material to recover a usable product or to regenerate the material. Spent materials, listed sludges and by-products, and scrap metal are usually considered solid wastes if they are reclaimed, while sludges that exhibit a hazardous characteristic, by-products, and commercial chemical products are not.

Materials recycled in ways that resemble ongoing manufacturing are **not** solid wastes, even if the recycled materials are spent materials, listed sludges or by-products, or scrap metal. A material is generally not a solid waste if it is:

Used or reused (without reclamation) as an ingredient in an industrial process to make a product.

Used or reused as an effective substitute for a commercial product.

Returned to the original process from which it was generated (without reclamation) as a substitute for raw material feedstock. The original process must use raw materials as its principal feedstock. This exclusion is sometimes referred to as "closed-loop" recycling (not to be confused with the next exclusion, also known as "closed-loop"). An example is returning solvent carriers from organic chemical production to the beginning of the process that generated them.

Returned to the original production process from which it was generated with prior reclamation (also referred to as the "closed-loop exclusion"). The materials must be stored only in tanks for no more than a year before being reclaimed, with the entire process enclosed through pipes or other conveyances. Materials recycled in this way are usually liquids (frequently organic chemicals).

DEFINITION OF "HAZARDOUS WASTE"

The statute generally defines hazardous wastes as solid wastes that pose a threat to human health or the environment if "mismanaged." Solid wastes become hazardous wastes in one of two ways - through EPA listings or by their characteristics. EPA has listed many solid wastes as hazardous in 40 C.F.R. §§ 261.31, 261.32, and 261.33. Solid wastes are also hazardous if they exhibit one or more of the following four hazardous characteristics: ignitability, corrosivity, reactivity, and toxicity.

EPA exempts certain solid wastes from the definition of hazardous wastes in 40 C.F.R. § 261.4(b). Other hazardous wastes are defined as "recyclable materials" (in 40 C.F.R. § 261.6) and are subject to alternative regulatory requirements (in 40 C.F.R. Part 266) tailored to the particular material and process.

Once the RCRA regulations define a material as a hazardous waste, EPA regulates almost everyone who handles it - generators, transporters, and treatment, storage or disposal facilities. The requirements that apply to each appear in 40 C.F.R. Parts 262 through 265. A more detailed discussion of these requirements may be found in Appendix B of this report.

CHAPTER 3

IMPROVING SUBTITLE C FOR RECYCLING

BACKGROUND

As part of the Agency's efforts to evaluate the RCRA program, EPA reexamined the definitions of "solid waste" and "hazardous waste" in the RCRA Implementation Study (RIS) published in July 1990. The RIS concluded that the definitions are difficult to understand and implement. Their complexity hampers permitting and enforcement of RCRA requirements. The RIS recommended ways for the Agency to address the identified shortcomings. These included clarifying who is regulated, establishing a consistent philosophy for regulating wastes and recycling, and locating the exemptions in one place in the regulations.

In response to the RIS recommendations, EPA held several public forums in late 1990 to solicit information from industry, Congressional staff, State personnel, the environmental community, federal facilities, and EPA regions. The public forums generally validated the findings of the RIS. They confirmed that the regulations are difficult to understand and apply, and that the rules do not regulate recycling consistently. Most affected groups observed that these and other shortcomings create impediments to hazardous waste recycling and competitive advantages for products made from virgin materials.

Forum participants recommended convening a group to help develop options that would make the RCRA recycling regulations address environmental risks in a more rational manner while reducing barriers to recycling. After analyzing the information collected at the public forums, EPA published a summary of its findings in the RCRA Implementation Study Update: The Definition of Solid Waste (July 1992) (RIS Update).

To follow up on the RIS Update, in October 1992 EPA's Office of Solid Waste created the Definition of Solid Waste Task Force, an internal EPA group charged with recommending solutions to the problems identified in the RIS Update. As a first step, the Task Force spent several months meeting with various State agency personnel, industry representatives, and the environmental community. The Task Force also visited several different kinds of recycling operations. These discussions and site visits confirmed for the Task Force the validity of the information previously gathered about regulatory problems. If anything, our sense was reinforced that EPA should make changes to clarify the system and encourage safe hazardous waste recycling.

WHAT WE HEARD

Each group--industry, States, and the environmental community--expressed somewhat different concerns, as summarized below.

Industry's concerns include:

The definitions of solid and hazardous waste are difficult to interpret and apply consistently;

The RCRA Subtitle C permitting process is costly, time-consuming, and uncertain;

Recyclable materials and their products cost more to produce;

The label "hazardous waste" stigmatizes hazardous waste recyclables;

States often interpret regulations inconsistently;

The system for permit modifications is too burdensome and sometimes irrelevant to the risks of the proposed modifications.

According to industry, these problems seriously affect manufacturing facilities because:

Businesses are reluctant to invest in recycling facilities without knowing whether they will need a permit or can obtain one if they do;

Recycling facilities are generally unable to compete with manufacturers using virgin materials;

Waste-derived products are perceived as less valuable than those made from virgin materials;

Consumer costs are raised, natural resources are wasted, and the creation of new jobs and new technology are stifled; and

Enforcement often emphasizes paperwork violations because they are easier to enforce.

The States' concerns include:

The definitions of solid and hazardous waste are too complex;

Legitimate recycling is difficult to distinguish from treatment;

Wastes are sometimes difficult to distinguish from products or raw materials;

The exemption for characteristic wastes sent for reclamation is an unjustified regulatory loophole; and

Since some recycling is entirely exempt, States cannot track the materials involved or inspect the facilities.

These concerns interfere with the States' ability to implement and enforce the RCRA program because:

They result in high administrative costs;

Exempt hazardous wastes may be mismanaged;

Legitimate recycling or manufacturing may be overregulated;

States are sometimes reluctant to approve or permit recyclers;

States are unable to advise the regulated community with any certainty before an enforcement action;

Enforcement is impaired if the regulators are not aware of the universe of facilities of potential concern.

The environmental community's concerns include:

The significant number of recycling sites on the Superfund National Priorities List;

Since some recycling is entirely exempt, regulators cannot oversee the activities;

No oversight, regulation, or product specifications exist for exempt waste-derived products.

The environmental community believes these factors endanger the environment because:

"Bad recycling is worse than good treatment and disposal";

Enforcement is impaired if regulators are not notified of recycling;

Undetected releases are more likely in unregulated operations;

Waste-derived products may hide the risks of hazardous waste.

In April 1993, the Office of Solid Waste held a public forum in Washington, D.C., attended by approximately 350 people. The Task Force presented several options for revising the regulations that define solid waste. The first option was a federal system with requirements tailored to different recycling categories. The categories could be based on industry, type of waste, risk, or the recycling process involved. The second option gave States that were authorized to implement the RCRA program broad discretion in determining their own requirements for recycling facilities or categories. EPA would develop minimum criteria for management requirements, upon which the States would base their programs. The third option limited any revisions to improving other parts of the RCRA program that are perceived as troublesome, such as certain permitting requirements or lack of assistance to States for interpretation and implementation.

Participants at the forum generally favored the first approach (national requirements tailored to categories of recycling). They believed that State-generated requirements would lead to greater inconsistency in interpreting and applying the regulations, possibly causing competitive disadvantages for recyclers in certain locations. Participants also believed that revising individual parts of the RCRA regulations not specifically related to recycling would make it harder to tailor controls to particular recycling situations. This approach might not address the concern that recycling regulations are insufficiently based on environmental risks differing according to process.

After the public forum, the Definition of Solid Waste Task Force met in June 1993 with State representatives from the Association of State and Territorial Waste Management Officials (ASTSWMO). Since EPA has authorized most States to administer the RCRA program, they have primary responsibility for implementing and enforcing its requirements. State approval of any changes to the recycling regulations is crucial to the success of the program.

The State/EPA group then developed more detailed regulatory options for a tailored, categorical recycling system. First, the group developed the appropriate categories into which hazardous waste recycling could feasibly be divided, so that the same or very similar controls could be applied to all facilities within a category. The group tentatively divided recycling into

four categories (Categories A, B, C, and D), based on the materials recycled and whether the recycling took place at the facility which generated the materials.

The Task Force, after consultation with the States, also concluded that EPA's Subtitle C management system needs a third tier between "excluded" and "permitted" for hazardous waste recycling. Precedents already exist in the Subtitle C regulations for imposing management requirements without a RCRA permit. Manufacturers may recycle secondary materials in a "closed-loop" process without a permit, but they must meet certain management criteria to be exempt (see 40 C.F.R. §261.4(a)(8)). Generators may accumulate, recycle, or treat hazardous waste for as long as 90 days without a permit, but they are subject to many of the Subtitle C management standards for tanks, containers, and containment buildings (see 40 C.F.R. § 262.34). Part 266, Subpart G, requires a permit for recycling lead-acid batteries, but exempts those who generated, transport, or collect the batteries without reclaiming them. The special collection or universal wastes rule proposed on February 11, 1993 (58 Fed. Reg. 8102) similarly would regulate many aspects of recycling of nickel-cadmium batteries and mercury without requiring a permit.

Based on these considerations, the Task Force and the States developed preliminary management requirements for each of the four recycling categories. The group's suggestions were described in a staff-level "straw proposal" to address hazardous waste recycling. In the meantime, EPA established a Definition of Solid Waste Roundtable to provide the Agency with technical comments on the straw proposal and on alternative regulatory options.

Twenty individuals participated in the Roundtable. Eleven were from various industries involved in recycling or treatment (such as chemical, steel, and automotive manufacturing, mining, metals recycling, petroleum refining, hazardous waste treatment, manufacturing with waste-derived fuels, and small businesses). Three were from environmental advocacy groups or consulting firms, and three were from State hazardous waste regulatory authorities (Oregon, Minnesota, and Oklahoma). In addition, there were three representatives from EPA Regions II, VII, and IX (for a complete list of Roundtable participants, see Appendix C).

EPA held a total of six Roundtable meetings, beginning in July 1993 and concluding in November 1993. As the meetings continued, the Task Force obtained invaluable technical comments from the participants on the definition of solid waste and hazardous waste recycling. With these comments, and with additional assistance from ASTSWMO, the Task Force further refined the straw proposal. A modified State/EPA plan for hazardous waste recycling was presented to the Roundtable and discussed in October 1993, and is the basis for the present report.

The system recommended by the Task Force classifies secondary materials by how they are managed, and then applies appropriate management standards. Under our scheme, there are three broad tiers of recycling:

- o Recycling that is exempt or excluded from most RCRA regulation (discussed in Chapter 4);
- o Recycling that must meet tailored standards for each of four recommended recycling categories (the "RCRA Recycling" system, discussed in Chapter 5);
- o Recycling that must meet full hazardous waste requirements, including a RCRA permit (discussed in Chapter 5).

CHAPTER 4

RCRA EXEMPT/EXCLUDED RECYCLING

EPA's jurisdiction over recycling practices has been very controversial. Industry asserts that the Agency has interpreted the applicable court decisions too broadly - that EPA regulates activities that are actually ongoing manufacturing processes. The Task Force disagrees with this assertion. We believe that the Agency's interpretation is consistent with the language of RCRA and with case law. We also believe that it furthers Congress' intent to prevent future Superfund sites by regulating activities that contribute to the waste disposal problem.

The Task Force recommends continuing EPA's current interpretation of its RCRA jurisdiction, while exercising jurisdiction differently in some areas. This includes defining exempt processes and materials more specifically to prevent them from becoming part of the waste disposal problem. Managing a secondary material before and during recycling in a manner that prevents its becoming part of the waste disposal problem can indicate that a material and recycling process are more like manufacturing than waste management.

The Task Force believes that this exercise of EPA's jurisdiction is necessary to fulfill the goals of RCRA. Without jurisdiction over recycling of secondary materials, EPA could regulate only landfills and incinerators (based on a strict interpretation of "discard"). In addition, the Agency could not address mismanagement of recycling until **after** a release had occurred, and could not distinguish sham from legitimate recycling in order to exercise appropriate oversight.

The RCRA Exempt/Excluded class proposed by the Task Force includes materials and processes that (1) are statutorily excluded, (2) may not be clearly excluded by the statute but resemble normal manufacturing, or (3) appear to present little incremental risk of harm to human health and the environment. It should be noted that products and co-products made from virgin materials are always excluded from EPA's RCRA jurisdiction. Our recommendations do not concern or affect those processes.

GENERAL CRITERIA FOR EXEMPTION

In addition to materials that the statute excludes, the new system exempts or excludes recycling that does not resemble disposal or treatment (consistent with current EPA policy and regulations). Below are the criteria that must be met for an activity to be exempt or excluded.

1. The secondary material may **not** be:
 - Placed on the land;**
 - Burned;**
 - Used to produce a fuel; or**
 - Accumulated speculatively.**
2. Most exempt recyclers must prepare and keep on file a **status determination**, stating the grounds on which they claim an exemption.

All criteria for exemption are explained in this section, along with our principal recommended modifications.

Recommendation #1: Exempt Secondary Materials May Not Be Placed on the Land

The Task Force recommends prohibiting land placement of secondary materials for most recycling in the RCRA Exempt/Excluded class. This prohibition is broader than the current requirement, which generally provides that **using** otherwise exempt secondary materials in a manner constituting disposal (applied to or placed on the land) disqualifies one for an exemption. However, current regulations do not prohibit **storing** exempt materials directly on the ground **before or during** recycling. Accordingly, certain practices that are currently allowed for RCRA-exempt facilities would, under our recommended approach, make them subject to the full set of RCRA hazardous waste management requirements. These practices include storing materials to be recycled in surface impoundments or waste piles. We recommend requiring that secondary materials be stored in tanks, containers, and containment buildings before and during recycling (although these structures would not be required to meet RCRA hazardous waste unit standards).

This requirement continues EPA's longstanding policy of prohibiting placement of hazardous wastes on the land. Mismanagement of hazardous wastes through improper land placement has led to significant contamination of groundwater. We believe that even more environmental damage could occur during land storage before recycling, since the secondary materials often contain higher concentrations of toxic constituents before they are processed into products.

The current regulations generally prohibit "use constituting disposal," i.e., land application of waste-derived products. There has been confusion over what type and duration of contact with the land constitutes land application. To clarify this requirement, we are recommending that products from exempt recycling processes **may** be applied to the land, unless EPA specifically restricts such application. Under our proposal, EPA would promulgate a list of uses of waste-derived products (such as road bed materials or fertilizer) that are most likely to involve extensive or prolonged land contact. This list would draw a clear distinction between products that are actually applied to the land, or incorporated into the soil (e.g., soil conditioners, fertilizers, and dust suppressants) and products whose contact with the land is incidental to their use (e.g., concrete).

Land application of a product **not** on the list would be allowed. Products on the list could be applied to the land, but the recycler would lose its exemption and would become subject to RCRA. The product would then have to meet applicable land disposal treatment standards or pass a test that demonstrated acceptable levels of hazardous constituents. For a discussion of this test, see the following section on the "toxics along for the ride" test (TAR) in "RCRA Recycling."

This approach will require that EPA continuously update its regulatory list, including new waste-derived products as they are developed. We will continue to evaluate whether this approach presents an unacceptable risk of failing to anticipate and prevent new and harmful uses of waste-derived materials on the land.

Recommendation #2: Three New Exemptions for Certain Secondary Materials Burned As Fuels or Used To Produce a Fuel

Like the prohibition against land placement, our recommendations generally continue EPA's longstanding policy that burning secondary materials for energy recovery or using them to produce a fuel should not be exempt activities. We do, however, recommend three new

exemptions for activities that resemble normal fuel production or that pose no incremental risk over burning traditional fuels. These exemptions are for "clean fuels," and two of them are for directly reusing hydrocarbons at a petroleum refinery. We would also retain the petroleum exemptions in the current regulations.

Burning of "Clean" Fuels

The first new exemption is the burning of "clean" fuels for energy recovery (i.e, fuels that contain levels of hazardous constituents that may be lower than those found in many common fossil fuels). These materials (to be specifically identified later) burn "cleanly" because they have low levels of toxic metals, contain negligible halogen concentrations to aid in formation of dioxins and furans, are not complex mixtures of organic compounds, and exhibit no hazardous characteristic except ignitability. They are, therefore, more likely to contain predictable and relatively safe products of incomplete combustion (PICs).

Thermal Processing of Certain Secondary Materials

The second new exemption is for thermal processing of certain secondary materials containing hydrocarbons at a petroleum refinery or a petrochemical plant. This proposed exemption is broader than the current regulatory exemptions for oil-bearing wastes at 40 C.F.R. § 261.6(a)(3)(v)-(viii)), and also includes secondary materials sent off-site for recycling (unlike the current exemptions).

Our goal is to allow direct reuse of these materials in commercial fuel production. The current direct reuse exemption (40 C.F.R. § 261.2(e)(i)) does not allow reused materials to be used in fuels. That limitation is intended to prevent unregulated blending of secondary materials into fuels for boilers and industrial furnaces (BIFs), not to prevent the production of standard commercial grade fuels by petroleum refineries. Producing fuels through thermal refining operations more closely parallels chemical production than mixing hazardous wastes for combustion in a BIF, since the hydrocarbon-bearing secondary materials introduced are compatible with petroleum refining processes designed to segregate and convert amorphous crude oils into finished high-specification fuels. We believe that this type of recycling should be considered direct reuse for materials recovery.

However, we are limiting this exemption to secondary materials processed at a refinery under the same ownership as the facility that generated the materials. Operators of these refineries have thorough knowledge of the incoming secondary materials, which increases the likelihood that the materials will be processed safely and effectively.

Blending of Certain Secondary Materials

The third new exemption is for blending secondary materials containing hydrocarbons directly (without thermal processing) into commercial grade gasoline at a petroleum refinery. An example is blending certain spent materials (such as xylene) into gasoline to use as an octane enhancer. Since commercial grade gasoline must conform to fairly strict product specifications, we believe that this type of blending would take place under conditions that would present little incremental harm to human health and the environment.

However, this exemption does not include secondary materials blended into diesel or other fuels since these fuels do not have the same strict product specifications as gasoline. It also does not include blending these materials at terminals or blending facilities, because it is too difficult to ensure that only compatible waste-derived materials are blended at these widely

scattered facilities. We believe the risks of improper blending warrant the restriction of this activity to a relatively small number of locations that are most likely to have the technical expertise to ensure that safe products are produced (such as refineries).

For these new exemptions, we recommend requiring the recycler to submit to the State or EPA a brief one-time statement that exempt recycling is performed at the site, the recycling location, and the grounds for any exemptions or exclusions claimed. We believe that the potential risk to the public of inserting incompatible materials into commercial fuels justifies such notifications.

Recommendation #3: Allow Incidental Processing

Under the current regulations, reclaiming a material (defined as recovery or regeneration) may disqualify a facility from an exemption under RCRA. Some industry observers have pointed out that certain types of reclamation are an intrinsic part of the manufacturing process and should therefore be considered exempt. These activities are usually physical in nature and include filtering, screening, sorting, and grinding. Sometimes they are conducted in portable (or "mobile") waste treatment units that are widely used to pretreat wastes and that present minimal risk of releases to the environment.

The State of California has conditionally exempted from its hazardous waste regulations certain treatment technologies used in recycling non-RCRA wastes. Exempt technologies include filtering, screening, sorting, sieving, grinding, physical or gravity separation without adding external heat or chemicals, pH adjustment, and viscosity adjustment. As a condition for this exemption, certain management requirements must be met, such as labelling and storing.

The Task Force agrees with this general approach, and recommends conditionally exempting simple, low-risk processes, if all applicable Subtitle C requirements are met for tanks, containers, and containment buildings. Exempt processes would include simple multiple filtration steps in sequence, and crushing, grinding, and sizing (when part of a single size reduction). Under our approach, an extended series of unrelated processing steps would not be considered incidental processing. We believe that EPA should work with the States to determine which activities constitute incidental processing.

The Task Force also believes that variances from the containment requirements should be allowed if the facility can demonstrate that its unit does not pose a significant risk and that compliance with the requirements would be technically or economically infeasible, especially if retrofitting an existing unit were necessary.

Recommendation #4: Allow Longer Accumulation Time for Exempt Secondary Materials Recycled On-site

The recommendation would modify the prohibition against speculative accumulation. This prohibition currently exists for most hazardous waste recyclers, but we propose modifying it to specify that secondary materials may be accumulated for 18 months on-site and 12 months off-site (the current limitation varies according to when the accumulation commences during a calendar year). The requirements are more stringent for off-site recycling, because we believe that recyclers should not accept and store secondary materials unless they plan to recycle them within one year. For on-site recycling (much of which is closed loop or direct reuse recycling), we have extended the accumulation period to 18 months. Production runs up to 18 months apart are not uncommon, and the recycler may need to store material until the production run that is

best suited for its reuse. We believe that this extension will not lead to speculative accumulation or endanger human health and the environment.

In addition, we recommend that material to be recycled must have a 100 percent turnover within the specified period. For a more complete description of this new requirement, see the discussion of speculative accumulation in Chapter 5 of this report.

We also recommend requiring the recycler to notify the State or EPA if secondary materials are stored on-site for more than 90 days. We believe that recycling facilities reclaiming secondary materials or storing them for extended periods have a greater potential for misclassifying treatment or disposal operations as recycling. Notification will allow regulatory agencies to quickly evaluate the need for more detailed follow-up at these facilities.

We realize that such a notification may pose difficulties for recyclers of characteristic by-products, since these materials are often difficult to distinguish from products and co-products. We will therefore evaluate whether to recommend notification for these facilities.

Recommendation #5: Facilities Exempt or Excluded From RCRA Regulation Must Perform and Keep on File a Status Determination.

We recommend requiring that any facility managing secondary materials determine whether it is subject to the RCRA regulations, including the new recycling system. If the facility determines that its activity is exempt or excluded from RCRA regulation, it must document its grounds for claiming any exemption or exclusion and keep this "status determination" on file. The facility will not be required to send the document to the State or EPA unless specifically requested to do so, but the document must be available for inspection if questions arise about the facility's status under RCRA. The status determination need not include the documentation required in responding to enforcement inquiries pursuant to 40 C.F.R. § 261.2(f). At the time of inspection, facilities would need to produce only a brief statement of the statutory or regulatory grounds for the claimed exemption or exclusion. Support for the determination could include a visual inspection of the units or processes claimed to be exempt.

Under our recommended approach, all exempt recyclers would be required to document the grounds for their claimed exemption, except those recycling **unused** products or scrap metal.⁷ We recognize that this may result in increased administrative costs for some facilities, especially large complex ones. We intend to explore whether this requirement can be implemented in a way that is manageable for such facilities, or whether the status determination requirement should be retained for all exempt facilities.

LIST OF SPECIFIC EXEMPTIONS

For easy reference, we have developed the following list of the specific exemptions or exclusions for processes and materials, and a table that lists the criteria that apply to each.

Specific exemptions are:

⁷The Agency has determined that unused products or recycling scrap metal should not be subject to Subtitle C requirements, and we have no information suggesting that these requirements should be changed.

Unused products returned for reprocessing⁸Scrap metal⁸

Processing of statutorily excluded materials (Bevill wastes⁹, i.e., specified wastes from the combustion of coal or other fossil fuels, certain ore and mineral mining wastes, and cement kiln dust).

Secondary materials directly reused on-site as an ingredient in a production process or as an effective substitute for a commercial chemical product (current 40 C.F.R. § 261.2(e)(1)(i) and (ii), modified).

Recycling of characteristic by-products, commercial chemical products, and container and spill residues of commercial chemical products. Commercial chemical products may be listed or characteristic; products may be technically "used," but no potential for contamination may exist through their use (e.g., encapsulated mercury and freon gases).

Materials returned, without first being reclaimed, to any unit operation of the original process in which they were generated and used as a substitute for raw material feedstock (current 40 C.F.R. § 261.2(e)(1)(iii), modified). Original process may use raw or secondary materials as feedstock, since this kind of recycling resembles normal manufacturing more than waste management.

Secondary materials reclaimed and returned to any unit operation of the original process from which they were generated, "closed-loop" (current 261.4(a)(8), modified). Recycling process must be enclosed in pipes or other closed conveyance systems, tanks, or containment buildings.

Recovery of energy from "clean" waste-derived fuels (e.g., ethanol, methanol, hexane) (recommended new exemption).

Direct reuse of secondary materials containing hydrocarbons in thermal processes at a petroleum refinery or a petrochemical plant. Includes reuse of secondary materials at petrochemical plants in processes that produce feedstocks sent to refineries for commercial fuel production (recommended new exemption).

Direct reuse of secondary materials containing hydrocarbons when returned for blending into a commercial grade gasoline at a petroleum refinery only (recommended new exemption)

Exemptions for petroleum refining oil recovery exemptions, as currently codified at 40 C.F.R. § 261.6(a)(3)(v-viii).

RESIDUES FROM EXEMPT/EXCLUDED RECYCLING

⁸Excluded from all RCRA regulation.

⁹ The Bevill amendment to HSWA deferred regulation of these wastes until EPA studied them and determined whether they should be regulated as hazardous wastes. 42 U.S.C. 3001(b)(3)(A).

The products or recycled materials from exempt/excluded processes are also exempt. However, we recommend that any materials or residues that are **disposed of or incinerated** be defined and regulated as solid and potentially hazardous wastes. If the waste exhibits one of the current characteristics of hazardous waste¹⁰ or any new characteristic (e.g., a characteristic codified by the pending Hazardous Waste Identification Rule), it would be considered hazardous.

We also recommend applying or continuing the applicability of the mixture and derived-from rules (as modified by the Hazardous Waste Identification Rule) to recycling residues that are disposed of or incinerated. This will ensure that residues from recycling a listed hazardous waste will also be hazardous. If the hazardous residues are mixed with a nonhazardous solid waste, the mixture would also be considered hazardous.

We recognize the potential legal difficulties in applying listings to residues from exempt materials. However, many common recycling residues are listed in their own right, such as stillbottoms from the distillation of spent solvents listed as F001 - F005. If our rationale cannot be legally sustained, we believe the Agency should develop a new listing rule to capture the residues of concern within the hazardous waste program.

¹⁰See Appendix B for a discussion of current characteristics and listings and of the mixture and derived-from rules.

CHAPTER 5

REGULATED RECYCLING

NEW CLASSIFICATION SCHEME FOR RCRA RECYCLING

The Task Force recommends dividing recycling into four categories, with facilities in each category being subject to the same management requirements. The categories and the controls for each category are described in this chapter. In general, recycling operations in all categories would be regulated unless specifically excluded.

We considered several objectives in choosing these categories. First, we needed to differentiate among the types of recycling and recyclers to address the over- and under-regulation of the current regulations. At the same time, we wanted to be sure that regulators and the regulated community could understand and implement the system. Four categories seem to be a manageable number, while still addressing the variety within the system. Finally, the system had to answer health and environmental concerns that RCRA is designed to address.

To accomplish these objectives, we recommend dividing recycling into categories based on the source of the recyclable materials and the recycling location. Recyclers within each category must then comply with management requirements tailored to address the differences among the categories. Some requirements apply to all the categories, with additional requirements for specific types of recycling.

We could have classified recycling in several different ways — by industry, process, recyclable material, or product. When the Task Force originally met with the States to develop a straw proposal for the Roundtable, we started with a much more complex system than the one suggested in this report. We divided recycling into seven categories: (1) on-site materials recovery; (2) off-site materials recovery; (3) on-site energy recovery; (4) off-site energy recovery; (5) product stewardship; (6) land-applied products; and (7) recovery of petroleum products.

As we discussed our concerns about each type of recycling and the appropriate management scenarios to address those concerns, we were able to combine some of the categories. We eliminated land-applied products because this use could fall into several other categories. At the first Roundtable meeting, the group suggested that the Task Force and States eliminate the energy recovery categories because they are adequately addressed in the boiler and industrial furnace (BIF) rule. In a later meeting, the Task Force and States decided to address the recovery of petroleum products by excluding certain secondary material reprocessed as fuels from the definition of solid waste (see our discussion on page 3).

As a result of these discussions, the **Task Force recommends** the following four recycling categories:

- Category A: Direct reuse off-site of a spent material
Precious metals recovery
- Category B: On-site recycling
- Category C: Captive (intracompany) recycling
Product stewardship
- Category D: Off-site commercial recycling

These categories are explained below, with a brief description of the management requirements for each.

Category A

This category includes spent materials directly reused off-site and the recovery of precious metals. The requirements consist of notification, biennial reporting, transportation according to Department of Transportation (DOT) hazardous materials regulations using a "recyclable materials manifest." In addition, facilities in this category must demonstrate compliance with the "toxics along for the ride" test described later in this section.

Under current Subtitle C regulations, EPA does not regulate the direct reuse of off-site secondary materials. For example, an electronics manufacturer uses a high-grade solvent in its production process, then sends the used solvent to another company. The receiving company uses the solvent, without reclaiming or reprocessing it, to clean automobile parts, a use that does not require the same purity as manufacturing electronic components. The used solvent is not defined as a solid waste and is exempt from all regulatory requirements. State regulators view this exemption as a regulatory loophole that should be closed. They want to know who generates and reuses these materials, and they want assurance that the materials actually arrive at their intended destination. We recommend notification, tracking, and reporting to accomplish this goal.

The Task Force recommends redefining a "spent material" as a material that has been used and is no longer usable **at the site of generation** or is used on site following reclamation or other processing. Characteristic by-products and off-specification commercial chemical products sent off-site for direct reuse would remain excluded, assuming that the product is not routinely applied to the land, stored on the land before or during production, or used as a fuel.

In the new system, the same requirements apply to the recovery of precious metals. Currently, precious metals recovery is regulated in 40 C.F.R. Part 266, Subpart F, which requires notification, recordkeeping, and shipping via a **hazardous waste** hauler with a **hazardous waste** manifest. In the new system, these materials would be shipped with a recyclable materials manifest and according to DOT regulations. Notification, recordkeeping, and biennial reporting requirements are the same as for direct reuse. All other requirements (including generator requirements, if applicable) would remain the same. We believe this slight relaxation of the current regulations for precious metals eliminates a significant impediment to recycling.

Precious metal recyclers are subject to any applicable requirements for burning in boilers and industrial furnaces (BIFs) under 40 C.F.R. § 266, Subpart H. The BIF rule currently exempts precious metal recycling from most significant requirements. However, EPA recently agreed to reexamine that exemption and consider issuing rules to control air emissions under RCRA or the Clean Air Act. The Task Force would adopt any pertinent changes in its proposed system.

Category B

Recycling secondary materials at a manufacturing facility (on-site recycling) is regulated as Category B in our recommended system.¹¹ Category B requirements would apply only to

¹¹Closed-loop recycling or directly using or reusing secondary materials on-site continues to be exempt from RCRA,

facilities generating more than 1000 kilograms of hazardous waste in any one month of a calendar year (i.e., large quantity generators). Generators of less than 1000 kilograms of hazardous waste in any one month (i.e., small quantity generators) would be subject to no new requirements under our proposed scheme.

We created this category for several reasons. First, we believe that manufacturers would increase their recycling of secondary materials if certain impediments were eliminated, especially the requirement to obtain a permit when regulated materials are stored for more than 90 days. To encourage increased recycling, the new system would not require manufacturers in Category B to obtain prior approval or to provide notice to the public before recycling on site. Similarly, any modifications to the recycling processes would be included in biennial reporting. The recycling of wastes already present on-site, subject to safe management standards established by EPA and the States, is generally of less concern to the public than recycling of wastes generated and shipped to another community. The risks of recycling performed entirely at the site of generation, therefore, do not justify the time, cost, and reduced flexibility caused by prior approval and public notice.

Certification by manufacturers that they are complying with the required management standards enables EPA and the States to enforce compliance. As discussed in more detail below, we are emphasizing **prevention** of risks by applying many hazardous waste management standards to hazardous waste recycling units. These management standards have been in general use for at least five years, and we believe that the States and the regulated community have found the requirements to be generally clear, affordable, and consistent with good engineering practices.

In our earlier discussion of jurisdiction (see Chapter 2 and Appendix A), we explained the difficulty of distinguishing manufacturing from recycling. This is a major question for Category B, especially when the recycled material is returned to the manufacturing process after reclamation. In the new system, a unit will be regulated as recycling only if recycled material is the **sole** ingredient processed by the unit. If any virgin materials are co-processed, the unit will be considered a manufacturing unit; the co-processing will not be considered reclamation. Any tanks storing both virgin and recycled materials prior to co-processing would likewise be defined as part of the manufacturing unit. In developing regulatory language to implement this approach, we will explore definitions that prevent *de minimis* additions of virgin materials intended to circumvent designation of a unit as a recycling unit.

Several industry parties have discussed situations in which secondary materials are reused on-site, but do not qualify for one of the current exemptions. For example, secondary materials are often reused in an on-site manufacturing process that is **not** the original process, thereby making the materials ineligible for the closed loop exemption. In addition, secondary materials from an otherwise closed loop process may be diverted for ancillary purposes, such as cleaning or quality assurance. Frequently, mobile closed containers or transportable tanks are used. Sometimes a secondary material may be the sole feedstock to another process producing a final product. However, distillation may be needed before final processing, making the materials ineligible for the direct reuse exemption because distillation has usually been considered a form of reclamation.

assuming the criteria described earlier in this chapter (page 2) are met.

Industry believes that these and most other kinds of on-site recycling constitute ongoing manufacturing rather than waste management, and that EPA should have no RCRA jurisdiction in these situations. The Task Force agrees that many of these situations closely resemble continuous manufacturing processes. For example, if very small amounts of secondary materials (one percent or less) are diverted from a closed loop operation for ancillary purposes, this should not disqualify the operation from the closed loop exemption. Nor should the use of mobile closed containers or transportable tanks be disqualified, as long as they meet standards equivalent to those of 40 CFR 265, Subpart I.

We are also aware that reuse of secondary materials involving distillation or recycling in a second manufacturing unit can often resemble ongoing manufacturing more than waste management. We want to encourage beneficial reuse of these materials, rather than present unnecessary impediments to their recycling. However, we are currently reluctant to suggest the Agency cede broad jurisdiction over **all** on-site recycling, because of the potential for activities taking place that are clearly waste management or mismanagement.

To address this concern, **the Task Force recommends** developing (in conjunction with the States) additional criteria to distinguish on-site manufacturing involving reuse of secondary materials from waste management. These criteria might include engineering design criteria or a sham recycling test involving economics or toxics along for the ride.

Category C

This category regulates captive (intracompany) recycling and product stewardship. Captive recycling includes facilities that recycle materials generated by other facilities under the same parent corporation. An ink manufacturer, for example, may send spent solvents used to wash equipment to another facility that is owned by the same corporation and that produces paint thinner. The second facility distills the solvents as part of its production process. If recycling the spent solvent in this way required a RCRA permit, the manufacturer might not recycle it, because of administrative costs.

Under product stewardship or product return, customers return used or spent products to an original manufacturer of the product. The manufacturer then recycles, rebuilds, remanufactures, or reuses all or part of the returned product. Many manufacturers would like to offer product stewardship as a service to their commercial customers and to reduce the costs of raw material. For example, a photographic processing company returns its spent fixative to the original manufacturer, who then reclaims and resells it. Since these materials are often hazardous waste if disposed of or treated, the manufacturer and the customer are able to avoid disposal costs and possible Superfund liability. We believe that our program will help build recyclability into products and foster increased use of existing capacity.

We recommend the same requirements for Category C and Category B facilities, with one exception. If a facility receives more than 12,000 kilograms of secondary materials annually

from off-site, it must notify the public and must allow access to nonconfidential materials.¹² No public meetings or prior approval would be required.

In their experiences with siting, permitting, and public meetings, States and EPA Regions have found that the public is most concerned about hazardous materials and wastes that come from other localities. We believe this concern results from increased truck traffic and the likelihood of accidents involving toxic materials, and the prevalent NIMBY (not in my back yard) attitude about activities involving hazardous wastes. Because of these concerns, the public should be notified that these materials will be transported to their community.

We will seek comments on ways to classify facilities in unusual situations. For example, Company X ostensibly sets up a product stewardship program. From the materials returned to it, however, it makes a product that is outside the plant's primary manufacturing function. Should Company X be classified in Category C, or as a commercial recycler in the next category, Category D? (Does it matter if the new product is made by recycling significantly more of the original products than Company X has manufactured?)

Another example is Company Y, which receives materials from several facilities within its parent corporation. No one facility generates enough of these materials for on-site recycling to be economically feasible, but the materials can be consolidated and recycled into a usable product. Company Y makes these products primarily from secondary materials and does not have any other manufacturing at its site. Should Company Y be classified as a captive recycling facility in Category C or as a commercial recycling facility in Category D?

Category D

Category D consists of commercial recycling facilities. These facilities purchase recyclable materials from generators or receive payment from generators to recycle their secondary materials. Generally, these facilities receive different hazardous wastes from various kinds of customers. Their products are made primarily from secondary materials instead of virgin materials.

Under our recommended system, all the requirements of Category C would apply. In addition, commercial facilities also must obtain prior approval for some of their operations (in lieu of a Part B permit) before they can begin recycling operations. Items requiring prior approval include a facility operations plan (with a waste analysis plan), financial assurance for closure, and major modifications to recycling units (involving significant changes in capacity, use of new secondary materials, or changes in the process chemistry.)

Both EPA and the States have found that local communities are reluctant to accept the presence of commercial recycling facilities whose design and operation have not been approved by the appropriate regulatory agency. Unlike facilities in Category C, commercial facilities use secondary materials and hazardous wastes for most or all of their raw materials. We believe an

¹²12,000 kg/yr is used to parallel the current definition of a large quantity generator (1000 kg/month) in the hazardous waste regulatory system. We have chosen to annualize the amount so that batch processors or facilities with highly variable monthly production rates are able to qualify as small Category C recyclers. We will continue to seek comment on alternative definitions of small versus large recyclers for this category.

approval process with full public participation can address most of the public's concerns. In general, Americans believe that government supervision of hazardous waste management is justified.¹³ Our approach will focus review by the regulatory agency on the most significant operations involving hazardous waste. By allowing the facility to certify compliance with the remaining requirements, we believe that we can reduce the costs associated with obtaining government approval.

TWO CURRENTLY EXEMPT ACTIVITIES THAT WOULD BE REGULATED UNDER RCRA RECYCLING

The Task Force recommends placing two currently exempt activities in the "RCRA Recycling" class, which would be subject to modified requirements under Subtitle C. Controls can then be targeted to those parts of the activities that pose a significant risk of potential releases. The activities that would be reclassified are:

Direct Reuse of Spent Materials Transported Off-site

Recycling of spent materials transported off-site for direct reuse (without reclamation) was explained earlier in the discussion of Category A. We believe that these materials should be minimally regulated so that appropriate controls can be placed on the likely transportation of these materials.

Recycling of Characteristic Sludges

Characteristic sludges (emission control residues) are not now considered solid wastes when reclaimed, because of the difficulty in distinguishing between reclamation of product-like sludges and reclamation of waste-like sludges. However, the Task Force and the States believe that **most** sludges should be classified as wastes rather than products, since they are expressly included in the statute's solid waste definition and because they typically are produced through pollution control or waste management activities.

It is true that certain kinds of emission control residues (e.g., baghouse dusts with high metal content collected from primary metal smelting) can be more product-like because they are very valuable and represent continuous extraction of metal values from ore. Within the primary metals industry, baghouse dust is routinely recycled rather than disposed of. We recommend exempting these materials as either co-products or exempt sludges if we can develop an appropriate definition that distinguishes them from residues without a high metal content. Operations outside the primary metals industry would not normally be considered "continuous" manufacturing of ore-derived materials.

MANAGEMENT REQUIREMENTS FOR RCRA RECYCLING

In selecting management requirements for each category, the Task Force relied on several key principles for recycling under RCRA jurisdiction:

Safe recycling operations must use equipment designed to prevent releases of hazardous constituents to the environment, especially groundwater.

¹³*Roper Reports* 93-3, 8-11; 92-9, 20-21;

Recyclers must quickly and effectively respond to releases of hazardous constituents that occur despite these preventive measures.

Government regulators must know the identity of recycling facilities and must have sufficient information to enforce compliance with the appropriate management standards.

An effective regulatory system must ensure safe transportation and tracking of secondary materials from "cradle to grave."

Waste-derived products must pose no more threat to human health and the environment than the virgin products they replace or compete with.

The community surrounding a recycling facility should be notified if the facility will receive and recycle hazardous waste generated at another facility.

Most of the requirements we recommend are self-implementing. Where prior approval must be obtained, we will explore ways to encourage government reviewers to respond to applications promptly. We have also eliminated redundancy with other laws and regulations wherever possible. Our recommended recycling system recognizes the needs of the public and the environment and the needs of industry. To compete successfully in an international market, industry must be able to make quick, accurate investment and operating decisions based on a predictable system of regulatory requirements. Many of our recommendations for improvements also may be appropriate for Subtitle C hazardous waste regulations. If these measures are successful for recycling, we will recommend that EPA consider applying some of them to hazardous waste management.

Table 1 compares the requirements for Categories A-D. Category A facilities are subject to minimal requirements necessary for regulators to track these materials. Facilities in Categories B, C, and D have almost identical management requirements. A final set of requirements for public notice or prior approval will apply only to Category C and Category D facilities.

TABLE 1
Comparison of Category A-D Requirements

Requirement	A	B	C	D
No land storage	X	X	X	X
No TARs	X	X	X	X
Recyclable materials manifest	X		X	X
State/EPA notification	X	X	X	X
Biennial reporting	X	X	X	X
Operating Plan		X	X	X
Certification		X	X	X
Management and administrative requirements		X	X	X
Release response, closure, and financial assurance		X	X	X
Public notice			X	X
Prior approval				X
Prior approval of modifications				X

Below is a detailed description of each management requirement.

No Land Storage

RCRA places a very high value on our groundwater. Congress believed so strongly in restricting land disposal that it added "hammers" to the 1984 amendments to RCRA. If EPA did not promulgate land disposal restrictions and treatment standards, the "hammer" would drop, and Congress' standards would go into effect automatically. As a result, EPA restricts the placement of untreated wastes on land, and treatment residues must be placed in landfills with stringent Subtitle C controls.

EPA's hazardous waste regulations generally prohibit placing secondary materials on the land. **The Task Force recommends** applying this prohibition more consistently in our new recycling system. Because of the potential for releases to the environment, EPA views land placement as a general indication that a material is "part of the waste disposal problem."¹⁴ We

¹⁴See, *American Petroleum Institute v. United States Environmental Protection Agency* ("API"), 906 F.2d 729 (D.C. Cir. 1990), and *American Mining Congress v. United States Environmental Protection Agency* ("AMC II"), 907 F.2d 1179 (D.C. Cir. 1990). See also Appendix A.

recommend prohibiting land placement as a condition of exemption from the recycling system, and as a management condition of all four recycling categories.

We recommend that the regulatory definition of "land disposal" apply to land storage before or during recycling. We intend to limit storage before or during recycling to tanks, containers, and containment buildings. Storage in surface impoundments or waste piles would not be allowed, and storage units would have to meet the tank design, installation, and operation standards in 40 C.F.R. Parts 262, 264, or 265.

Some situations exist where the recyclable material is a product meant to be applied to the land (i.e., slag used as road bed material). These materials may be exempt from the new recycling system if: (1) good management practices by the facility prevent releases to the environment before actual use; or (2) the material can be delisted or shown to no longer exhibit the characteristic for which it was listed; or (3) the material is a commercial chemical product listed in 40 CFR 261.33 that is applied to the land and that is its ordinary manner of use.

Recycling Must Be Legitimate

One of the dangers of relaxing requirements for recycling is the increased incentive to engage in "sham" recycling. Sham recycling is managing hazardous waste in a way that actually constitutes disposal instead of legitimate recycling. Any system we develop must deter sham recycling and enable enforcement personnel to identify the process as sham and successfully prosecute the violator.

EPA has often discussed criteria to determine whether an activity is sham recycling.¹⁵ Because the criteria are not binding rules, State and EPA enforcement staff have been concerned about how to apply the criteria with consistency. Some members of the regulated community were not aware of any Agency "sham policy." Others find application of the policy to be very time-consuming and expensive, with little certainty of outcome.

One criterion in EPA's policy is that a legitimate product should not contain toxics along for the ride (TARs). TARs are hazardous constituents not necessary for the product to perform as was intended. These hazardous constituents may also be present in significantly higher levels than in comparable products made from virgin materials. States and EPA regions are concerned that industry may not test its recyclable products for unacceptable TARs. Of particular concern are products used by the general public or products applied to the land.

The Task Force recommends prohibiting TARs as a condition within each of the four recycling categories. Although the Toxics Substances Control Act, the Consumer Products Safety Act, and the Food and Drug Act have some jurisdiction over this issue, the large number of products potentially affected by an increase in recycling of waste-derived products makes reliance on these regulatory authorities impractical. Over three-fourths of Americans do not believe that industry will make products that are safe, environmentally or otherwise, unless the government makes sure that it does.¹⁶ This lack of faith in product safety without government

¹⁵See, e.g., 50 *Fed. Reg.* at 638 (April 4, 1985); 53 *Fed. Reg.* at 522 (January 8, 1988); 53 *Fed. Reg.* at 17606 (May 11, 1988); and 56 *Fed. Reg.* at 7185 (February 21, 1991).

¹⁶*Roper Reports*, 90-4 at 104.

oversight has changed little over the past decade.¹⁷ We believe that recyclers should continue to have a duty under RCRA to demonstrate, if asked, that their waste-derived products will not create significant new risks to the users of those products.

We also recommend allowing RCRA recyclers to substitute the TAR test for applicable land disposal restrictions standards (LDRs) for uses of waste-derived products meeting our new definition of use constituting disposal. The hazardous constituent levels required by the LDR standards can be significantly more stringent than the levels in products made from virgin materials. The TAR test will ensure that waste-derived products do not create **new** risks in the marketplace.

The Task Force has proposed a test for TAR which consists of three parts: products made from secondary materials would have to pass only one of the three tests. The first test is a self-implementing analytic method. The second and third tests require government review and approval - a case-by-case evaluation of the legitimacy of the product or process. For the first test, a product would have to pass a statistical test chosen by EPA that compares it to a similar product made from virgin materials. The concentration and amount of Appendix VIII hazardous constituents in the recycled product could not be significantly higher than present in a comparable product made from virgin materials. Alternatively, a recycler could compare the concentrations of hazardous constituents in the recyclable material to those present in the virgin materials that would otherwise be used to make the product.

This evaluation is designed to prevent a manufacturer from replacing a commercially available virgin raw material with a recyclable material containing significantly higher concentrations of toxics. We want to avoid the presence of **additional** toxics not significantly present in the analogous virgin material. The goal of the analysis is not to ensure that recycled products are absolutely without risk, or to create new standards of product safety. Instead, we will ensure that recycled products are at least as safe as their virgin material counterparts. We believe that other laws, such as the Toxic Substances Control Act, the Consumer Product Safety Act, and the Occupational Safety and Health Act are better designed to evaluate the effect of products and processes on consumers.

In some instances, a recycler introduces a toxic ingredient to enhance the performance of a product. For these situations, we recommend a second test, allowing an individual manufacturer or industry to apply for a variance from the TAR threshold. The manufacturer must show that the higher toxic levels are necessary for the product to function as intended, or that an industry specification otherwise justifies higher concentrations of toxics.

Finally, a manufacturer may obtain a variance from the TAR threshold based on a life cycle analysis of the product. If a manufacturer can show that the product presents no significant increase in risk to human health or the environment over its life (including the most likely disposal scenarios), a variance will be granted, despite the presence of higher toxic constituent concentrations. An example is a product with toxics that are not likely to be released because strong chemical bonds exist between the toxics and other ingredients. In this case, recyclers also would need to show that the product would be used in industrial applications that would not normally result in disposal in a municipal waste combustor, if breaking those chemical bonds during incineration would increase the toxics present in the combustor's ash or air emissions.

¹⁷ *Id.*

Any materials failing all three tests would be classified as wastes rather than products, and the subsequent transportation, storage, and use would be subject to full Subtitle C regulation. If a waste-derived product passed the TAR test, its status would not be affected if another material produced from the same recycling process failed to pass TAR.

We initially suggested in our straw proposal that any product from Category A could not contain "toxics along for the ride." Some parties have suggested that the costs of applying TAR to this category outweigh the environmental benefits. However, after examining the results of reviewing proposed off-site uses of waste-derived materials, we have concluded that TAR is an important tool in preventing these facilities from avoiding RCRA requirements. Both EPA and the States have rejected a significant number of proposals for direct reuse of wastes (as ingredients or effective substitutes for commercial chemical products) after finding that the activity more closely resembled waste treatment or disposal.

In order to minimize the costs of this requirement, we recommend that recyclers be allowed to certify compliance based on process knowledge and existing data. However, EPA and State agencies should retain the authority to require that recyclers generate more specific data to demonstrate TAR compliance when those agencies believe that the waste-derived products may introduce significant new risks into the marketplace.

Many useful options have been suggested to improve our recommended TAR test, which we are actively considering. These include:

- o Presuming the legitimacy of products that pass TAR Test 1 above, but allowing the State or EPA to prove that it is otherwise sham or unsafe based on factors other than TAR.
- o Determining legitimacy by the economics of the recycling (e.g., the minimum percentage of profit derived from sale of products).
- o Applying TAR tests or other legitimacy tests only to consumer products or land-applied products.
- o Codifying more than one criterion for the legitimacy determination, such as an economics test and a TAR test.

Notification and Reporting

Several types of notification and reporting are currently required under EPA's hazardous waste rules. These rules require generators, transporters, and treatment, storage or disposal facilities (including recyclers) to file an initial notification with EPA or a State. Recyclers who believe that they are managing secondary materials excluded from the definition of solid waste are not required to notify. The notification provides basic information about the notifying facility (e.g., name, address, contact person) and information about the type of activity occurring at the facility (e.g., generator, transporter) and the particular EPA waste codes managed. The notification form does not require facilities to specifically identify any recycling activities.

Every two years, EPA also requires large-quantity generators (producing more than 1000 kilograms of hazardous waste per month) and treatment, storage, and disposal facilities (TSDFs) to file a "Biennial Report" on the volume and type of wastes they generated, how they managed the waste (e.g., recycling, treatment, disposal), and whether it was managed on- or off-site. A recycler who is not a large-quantity generator or TSDF does not file a Biennial Report. Neither

the EPA Notification Form nor the Biennial Report currently requires information on modifications to recycling units or facilities.

Because some recyclers are exempt from biennial reporting, and others incorrectly believe they are recycling exempt materials, the States and EPA do not have adequate information about the true effect of recycling. Without this information, enforcement personnel cannot monitor recycling activities to ensure compliance with applicable regulations. The State and EPA enforcement staffs believe that this state of affairs has led to inadequate control and subsequent mismanagement, as evidenced by the many closed recycling facilities that are now Superfund sites on the National Priority List.

The Task Force recommends that all RCRA recyclers in Categories A-D notify the State or EPA of their activities. This is a new requirement only for Category A (direct reuse off-site) and facilities that do not store before recycling. In addition, we recommend that the existing notification form be revised to require a specific identification as a Category A, B, C, or D recycling facility and the type and quantity of wastes recycled. This form could also be used to facilities claiming certain exemptions, such as facilities recycling a characteristic by-product or those storing materials for more than 90 days prior to recycling. This information will allow the States and EPA to target compliance inspections.

The Task Force also recommends that biennial reporting be required for Categories A-D (again, a new requirement only for Category A and facilities that do not store before recycling). We suggest that the Biennial Report be expanded to report all modifications to Category B and C recycling operations and minor modifications to Category D operations.

Transportation and Manifesting

Under current RCRA rules, hazardous waste shipped off-site for recycling requires a hazardous waste manifest and must adhere to RCRA pre-transport and shipment requirements. EPA and the States use the manifest for tracking off-site shipments to ensure "cradle-to-grave" management of the material and to hold the generator, transporter, and TSDf accountable for these shipments.

The manifest is a document completed by a hazardous waste generator describing the amounts and types of hazardous waste being transported. The document is comparable to a bill of lading used by industry in transporting materials. As part of this document, an individual knowledgeable about the hazardous waste must be identified in case of an accident or release to assist local authorities in spill response activities.

RCRA regulations reference DOT pre-transport regulatory requirements for packaging, labeling, marking and placarding (49 C.F.R. Parts 172, 173, 178, and 179). DOT has nine categories of materials with varying requirements for labelling, placarding, packaging, and marking. If a recyclable material does not fall under one of the first eight categories, it would automatically fall into Class 9, which is the current DOT category for RCRA hazardous waste.

The DOT Class 9 requirements are virtually identical to the EPA standards for hazardous waste transporters in 40 C.F.R. Part 263. Some States have added extra requirements for transporters of materials requiring a RCRA hazardous waste manifest. These requirements include special training or equipment, more liability insurance, local taxes or fees, and additional reporting. Generators and recyclers have claimed that these additional State requirements substantially increase the cost of transporting RCRA hazardous manifested materials directly by

increasing operating costs of transporters, and indirectly by reducing competition because only relatively few transporters are willing to invest in compliance with the State rules.

As an example, the costs of transporting a load of lead-bearing materials between Columbus, Georgia, and Indianapolis, Indiana, was \$1,400 by a hazardous waste hauler and only \$630 by a hazardous materials carrier (DOT). Similarly, the costs of transporting the same materials from Muncie, Indiana, to Indianapolis was \$533 by a hazardous waste hauler and \$160 by a hazardous materials hauler.¹⁸

The Task Force recommends using a new "recyclable materials" manifest for all Category A, C, and D secondary materials shipped off-site. This new manifest could be identical to the current hazardous waste manifest, except for its name. The effect of making this change would be to eliminate the "stigma" associated with transportation of hazardous wastes and also, to the extent possible, to eliminate the more stringent State requirements that automatically attach to shipment of materials requiring a Uniform Hazardous Waste Manifest. The recyclables manifest would still provide identical information for States that rely on automated tracking of manifest data for their hazardous waste enforcement programs.

Because many States cannot inspect manifest data immediately upon receipt, we recommend allowing States to require monthly or quarterly submission of manifest information for recyclable secondary materials. Exception Reports describing shipments that did not reach their destination within 45 days would continue to be filed immediately.

To eliminate redundancy between DOT and EPA transportation rules, the Task Force recommends that the Agency seek changes to the DOT rules to incorporate RCRA recycling materials regulated under Categories A, C, and D. If the DOT transportation safety rules apply, there will be no need to establish separate requirements under RCRA (other than manifest procedures) that apply to transportation of these secondary materials.

FACILITY AND RECYCLING UNIT MANAGEMENT STANDARDS

General Facility Standards

Under the current hazardous waste regulations, generators and TSDFs (including recyclers) must comply with general management standards to minimize any threats posed by the facility to human health and the environment. These standards are found at Subparts B, C, and D of 40 C.F.R. Parts 265 (for interim status facilities) and 264 (for permitted facilities). The standards for generators are found at 40 C.F.R. Part 262, Subpart C.

Under the standards for TSDFs, the facility must obtain an EPA ID number, perform a general waste analysis, maintain security measures aimed at public access, inspect the plant, train personnel for managing hazardous waste, comply with location standards, and provide construction quality assurance programs. The standards also include general requirements for ignitable, reactive, or incompatible wastes.

Preparedness and prevention standards for TSDFs include design and operation standards; required equipment such as alarms; testing and maintenance of equipment; access to

¹⁸From a 1994 survey conducted by RSR Corporation, sent to the Task Force. This information is included in the RCRA docket.

alarm systems; required aisle space; and arrangements with local authorities (such as police and fire departments).

Contingency plan and emergency procedures standards for TSDFs include a contingency plan for fires, explosions, or unplanned releases of hazardous waste; procedures for amending the plan; appointment of an emergency coordinator; and steps that the coordinator must follow in case of an emergency, including assessment, containment, and cleanup.

Pretransport requirements for generators include requirements for pretransport labeling, marking, and placarding. This provision also states that large-quantity generators are subject to Subparts C and D of Parts 264 and 265, and the personnel training requirements for hazardous waste handling of Subpart B. Small-quantity generators are subject to Subpart C of Part 265. In addition, small-quantity generators must follow requirements for responding to emergencies (see 40 C.F.R. Part 262(d)(5)) that are similar to those for TSDFs, but somewhat simplified.

The Task Force recommends adopting the requirements in Parts 264 and 265, Subparts B, C and D, for all recycling categories, except Category A (direct reuse of spent materials sent off-site). Since the primary goal of exercising RCRA jurisdiction over Category A recyclers is to ensure that the materials are handled safely when sent off-site, general facility standards are unnecessary.

In the case of the other recycling categories, we believe that these requirements will ensure that facilities are managed in a way that will prevent releases of hazardous wastes and facilitate prompt response measures if releases do occur. However, we realize that most of the requirements in Subpart B of Parts 264 and 265 (for TSDFs) do not currently apply to generators, and we were unable to evaluate whether all of these requirements are necessary for our recycling categories B, C, and D. For example, the full security requirements of Subpart B or the location standards may not be necessary for many or most recycling operations. Therefore, we are considering simplifying these requirements so that some or all facilities would comply only with the generator standards.

Certain employee protection requirements under the Occupational Health and Safety Act (OSHA) are tied to facilities that are permitted TSDFs under RCRA. These requirements are set forth in 40 C.F.R. 1910.120(p) for TSDFs and 40 C.F.R. 1910.120(b)-(o) for facilities involved in RCRA corrective action cleanups. The requirements include written safety and health programs for employees, health measures, material handling requirements, personnel training, and extensive procedures for emergency responses. Since the facilities in the Task Force's proposed recycling scheme would not be required to obtain RCRA permits, these OSHA requirements would no longer apply. We will continue to examine these requirements and determine whether including the provisions is consistent with ongoing recycling rather than treatment, storage, and disposal operations.

Facilities (including recyclers) that may release hazardous substances as defined by CERCLA have alternative emergency response requirements under OSHA, with which they would still be required to comply (see 40 C.F.R. 1910.120(q)).

Containers and Container Storage Areas

Hazardous waste containers and container storage areas are currently subject to 40 C.F.R. Part 265, Subpart I (for generators and interim status TSDFs) and Part 264, Subpart I (for permitted TSDFs). These standards are performance standards (rather than specific design

standards) and are intended to prevent releases of hazardous constituents from containers to groundwater. They require primary containment (e.g., by replacement of worn-out containers and requiring container construction that is compatible with the materials stored). Also required are inspection procedures for unit closure. TSDFs must install secondary containment to capture any releases from container storage areas.

The Task Force recommends adopting the TSDF standards (40 C.F.R. Part 264, Subpart I) for managing recyclable materials in containers and containment areas at all Category B-D facilities. Hazardous waste container storage areas have been subject to these regulations for more than five years, and we believe that the rules have provided good protection of groundwater without overly burdening the regulated community.

Tanks and Tank Systems

Tanks and tank systems¹⁹ must comply with standards in 40 C.F.R. Part 265, Subpart J (for generators and interim status TSDFs) or Part 264, Subpart J (for permitted TSDFs). These standards are meant to prevent releases of hazardous constituents to groundwater. They require an initial assessment of the integrity of the tank system; containment and detection of releases; minimum design and installation specifications; general operating practices; proper inspection; response to leaks and spills; and closure and post-closure care.

Although the RCRA regulations address most aspects of tank systems, the emphasis is on secondary containment and leak detection (40 C.F.R. §§ 264.193 and 265.193). In a secondary containment system, two impermeable barriers are situated between the wastes and the external environment. The first barrier is the wall of the treatment or storage tank. The secondary barrier may be a second tank wall, a concrete vault, a liner (such as a synthetic membrane liner), or another device approved by the permitting authority.

Secondary containment must capture 100 percent of the volume of the largest tank within the containment system. The ancillary equipment of the tank system must satisfy technical requirements for material compatibility, tank system strength, system foundation, leak detection, and liquid removal.

If a leak occurs in the primary tank wall, the secondary containment barrier prevents the release of wastes into the environment. The secondary containment system also provides an enclosed space in which leaks from the primary tank system can be easily detected and removed.

Spill prevention controls must prevent the release of material during tank filling, content transfer, and emptying. Facilities using hazardous waste tanks must provide design and/or operating features to prevent spills and overflows.

All ancillary equipment must also have appropriate secondary containment, as required in 40 C.F.R. § 264.193 (f) and 265.193(f). Certain ancillary equipment is exempted (for example, above-ground and readily accessible piping that can be inspected daily). In general, tank systems must satisfy the technical requirements for:

¹⁹Tank systems include tanks and any associated equipment, such as pipes, pumps, flanges, and valves.

Material compatibility. Both primary and secondary containment structures must be made of or lined with a material that will not be weakened or degraded by the waste placed in the system.

Tank system strength. The system must be strong and thick enough to withstand any foreseeable forces to which it may be subjected (for example, the pressures exerted by groundwater, frost heave, or vehicular traffic over or around the tank system).

System foundation. The foundation or base of the system must be capable of preventing system failure due to settlement, compression, or uplift.

Leak detection. A leak detection system must be installed that is capable of detecting the failure of the primary containment structure. The system must be capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

Liquid removal. The secondary containment system must be sloped or otherwise designed and operated so that all liquids entering the system can be efficiently collected and removed.

A tank owner or operator may petition the EPA Region or authorized State to obtain either a technology- or risk-based variance from the secondary containment requirements.

Integrity Assessments. The tank regulations allow facilities to add secondary containment to an existing (primary containment) tank system any time until it is 15 years old. Under 40 C.F.R. §§ 264.191 and 265.191, owners or operators of existing tank systems without adequate secondary containment were required to have an independent, qualified, registered professional engineer perform an integrity assessment by January 12, 1988. The integrity assessment determined if the tank system was leaking or unfit for service.

Design and Installation. Sections 264.192 and 265.192 provide standards for designing and installing new hazardous waste storage and treatment tank systems or components. The principal design requirement is that new systems or components must be provided with secondary containment. This requirement applies not only to new tank systems, but also to:

any tank, piping, or other equipment installed as an expansion or replacement to an existing tank system;

existing equipment moved or reinstalled to replace components of existing hazardous waste tank systems;

any existing tank systems or components not historically used for hazardous waste treatment or storage, but into which hazardous waste has been or will be introduced after July 14, 1986.

As part of these requirements, all new tank system design features and installation procedures must be assessed and certified by an independent, qualified, registered professional engineer.

General Operating Requirements. Sections 264.194 and 265.194 address the day-to-day operation of hazardous waste treatment and storage tanks. These requirements govern the nature of materials that may be introduced into the tank and the use of spill and overflow prevention

controls. More specifically, no hazardous wastes or treatment reagents may be introduced into a tank system that may jeopardize the integrity of the tank.

Similarly, tank system operators must provide design and/or operating features to protect against spills and overflows. Spill prevention controls should prevent the release of material during tank filling, content transfer, and emptying.

Requirements for Tank System Inspections. Facilities must inspect the following components of hazardous waste treatment and storage tanks and tank systems: overfill controls, data from operating equipment, release detection equipment, above-ground tank system components, and corrosion protection devices (40 C.F.R. §§ 264.195 and 265.195).

The design specifications also require secondary containment. The secondary barrier can be a second tank wall, a concrete vault, a liner (such as a synthetic membrane liner), or another device approved by the State.

All new tank system designs and installation procedures must be assessed by an independent, qualified, registered professional engineer.

The Task Force recommends adopting 40 C.F.R. Part 265, Subpart J requirements for the management of Category B-D recyclable materials in tanks. Like EPA's container regulations, the hazardous waste tank rules are time-tested, provide the necessary protection of groundwater, and are affordable. We believe that existing tanks that will be subject to these standards should be granted the same amount of time to achieve compliance that was provided to existing hazardous waste tanks when the requirements were promulgated (up to 15 years, depending on the age and condition of the tank). We also recommend that States should have the flexibility to evaluate alternative compliance measures that achieve the same objectives as the RCRA tank rules.

In addition, the Task Force recommends that variances be allowed from these rules for existing recycling units, if the facility can demonstrate that retrofit of those devices is either technically or economically infeasible. Any variance should include a demonstration that the unit, as installed, presents no significant risk of releasing hazardous constituents to groundwater.

Containment Buildings

Standards for managing hazardous wastes in containment buildings (storage units where a building with roof, walls, and floor can provide containment of waste) are found in 40 C.F.R. Parts 264 and 265, Subpart DD. Containment buildings are a relatively new management practice designed to address the problem that arose out of the Third-Third Land Disposal Restrictions rule prohibiting the placement of certain dry bulk hazardous wastes on the land prior to treatment. This prohibition had the inadvertent effect of limiting storage practices for materials destined for recycling. The inconsistency arose because EPA regulations allow the storage of liquids in tanks or containers prior to treatment or recycling.

To address this issue, EPA promulgated containment building standards. These standards consist of four parts: standards that must be met for a containment building to be excluded from the definition of land disposal; design and operating standards; closure requirements; and operating standards that apply only to storage less than 90 days in a containment building at a generating facility.

The main emphasis of the regulations, however, is on prescribed performance standards. These standards include a building structure that is completely enclosed with a floor, walls, and a roof to prevent exposure to the elements; ensuring incompatible wastes are not placed in the unit; installing a primary barrier capable of withstanding the movement of personnel, waste, and equipment during the lifetime of the unit; good housekeeping practices to keep the primary barrier free of significant cracks, gaps, or corrosion; certification of the building by a qualified, registered professional engineer; release detection and removal procedures; and unit inspections.

For units managing free liquids, the building must have both primary and secondary containment. The primary barrier must be designed to prevent the migration of wastes into the barrier, and it must be sloped to drain liquids into a liquid collection and removal system. The secondary containment system must include a secondary barrier designed and constructed to prevent migration into the barrier and a leak detection system capable of detecting failure of the primary barrier and collecting accumulated liquids at the earliest practicable time.

The Task Force recommends adopting 40 C.F.R. Part 265, Subpart DD standards for managing recyclable materials in containment buildings. These standards were developed after extensive technical consultation with the regulated community, and represent an economically achievable way to prevent contamination of groundwater. We also recommend that containment buildings be considered adequate secondary containment for furnaces recycling secondary materials.

Air Emissions

EPA presently regulates process vent air emissions of volatile organic compounds (VOCs) from all hazardous waste management units at TSDFs under Subparts AA of Parts 264 and 265 and equipment leaks of VOCs from hazardous waste management process units under Subparts BB in Parts 264 and 265. EPA also has proposed regulations (Subparts CC under Parts 264 and 265) to extend its air emissions standards to surface impoundments, tanks, containers, and miscellaneous hazardous waste units not covered by the Subpart AA and BB standards. As part of this proposed rule, EPA also proposed extending the applicability of Subparts AA and BB of 40 C.F.R. Part 265 to hazardous waste generators accumulating waste on-site for 90 days or less.

The Agency has promulgated regulations under the Clean Air Act (CAA) and its amendments that can apply to the same facilities and constituents as RCRA. The requirements generally affect total emissions from the facility (from both RCRA permitted units and other units), while the hazardous waste program rules generally affect only RCRA permitted units.

The CAA requires EPA to identify and designate compounds as hazardous air pollutants (HAPs), then develop standards to protect the public with an ample margin of safety. The Agency has designated, among other constituents, arsenic, asbestos, benzene, beryllium, and mercury as HAPs.

A second CAA program designed to assist the States in achieving National Ambient Air Quality Standards (NAAQS) for ozone may limit the same air emissions as the RCRA Subpart AA and BB rules. Under the authority of the CAA, EPA has developed a series of Control Technical Guidelines Documents (CTGs) describing emissions controls for existing emissions and recommending standards for incorporation into State Implementation Plans (SIPs). CTGs were specifically limited to VOC emissions. Because of the RCRA TSDF air rules, EPA decided not to issue a CTG for facilities affected by these rules. Instead, EPA advised the States of the

existence of the RCRA rule and suggested that they include it in their overall planning for VOC reduction. In some cases, States may have elected to write specific air rules for these sources; or some of them may be affected by air rules not specifically focused on hazardous waste units.

Another CAA program potentially limiting VOC emissions at TSDFs is the Prevention of Significant Deterioration (PSD)/New Source Review (NSR) permitting program. This program is intended to attain and maintain the NAAQS. Although PSD and NSR differ significantly, each requires stringent controls on emissions from new, modified, or reconstructed emission sources.

The CAA amendments continue the CAA programs, but amend two of the programs potentially affecting TSDF VOC emissions, and adds a new permitting program. The most significant change is in the National Emission Standards for Hazardous Air Pollutants (NESHAPs) program. A key feature requires the Agency to regulate 189 compounds and compound groups identified by Congress as HAPs. Under the first phase of this program, facilities must meet Maximum Achievable Control Technology standards to control excess toxic air emissions, or HAPs, from specified industries. Several years later, EPA is required to evaluate the residual health effects based on these standards, and to develop more standards as needed.

The CAA amendments also provide for new programs and regulations to attain the NAAQS, in particular the ozone NAAQS. EPA must develop new CTGs for the States to implement as part of their SIPs. The most dramatic changes require EPA to impose sanctions on States failing to meet the NAAQS or certain mandatory milestones and allow the States increased flexibility to administer their air programs. To avoid the sanctions, States must reduce VOC emissions in ozone nonattainment areas. States have been encouraged to ensure implementation of the RCRA air rules to address VOC emissions from these sources. In addition, they may have generic VOC rules that coincidentally apply to TSDF recycling units.

The CAA amendments also added an operating permit program similar to the NPDES permitting system under the Clean Water Act. All States must develop and implement permit programs; permits will include all CAA amendment provisions relevant to the facility (e.g., NESHAPs), but will not necessarily include provisions mandating the same controls as RCRA air regulations. This is because: (1) hazardous waste facilities may not be large enough sources of air emissions to trigger CAA requirements; (2) facility-wide limits may encourage companies to focus on controlling bigger sources of emissions within the facility; (3) industry-specific rules may not be completed for several years; or (4) States are relying on the RCRA air rules for the emission reduction.

The Task Force recommends relying on CAA amendment requirements for Categories B-D, rather than RCRA TSDF air emission regulations for units involved in the recycling process (storage containers, tanks, and reclamation units). This recommendation would only apply to situations where it is clear that CAA standards will limit air emissions from the recycling process and storage units.

There is a strong possibility that both the CAA amendments and RCRA will regulate the air emissions from recycling processes in the near future. The Task Force recommends eliminating this potential redundancy by relying on CAA standards and regulations whenever possible in order to benefit from the prioritization of air emission sources that is possible under that program.

Operations Plan

Detailed operations plans are currently required as part of the Part B permit process (see 40 CFR §§ 270.14-26). These plans describe very specifically how the secondary material will be managed from receipt through storage, treatment, and disposal. Information provided includes: a general description of the facility; chemical and physical analyses of hazardous waste in order to manage the material in accordance with Part 264 management requirements; a copy of the waste analysis plan; and a description of procedures, structures, or equipment used at the facility to prevent hazards in unloading operations, or prevent runoff from hazardous waste handling areas to other areas of the facility or environment.

The Task Force recommends that facilities in Categories B, C, and D provide the State with a more simplified operations plan as a condition of compliance. This operations plan would consist of two parts. The first part would be a waste analysis plan that would describe the chemical and physical processes used to measure and identify chemical parameters in the secondary materials, the frequency of measurement, quality assurance and control procedures, and how the facility decides to accept or reject materials destined for recycling. The second part of the plan would describe facility operations, including how recyclable materials are handled and processed from receipt through recycling.

Speculative Accumulation

The limits on accumulating hazardous waste for speculative purposes are found in 40 C.F.R. § 261.1. The purpose of these rules is to prevent the storage of large inventories of hazardous secondary materials otherwise exempted from the hazardous waste management system. Because RCRA does not regulate these materials as hazardous wastes, accumulating large quantities for an extended time could significantly threaten human health or the environment. If leakage from improper storage contaminates the soil or groundwater, removal could also impose significant financial burdens on taxpayers if the responsible company is unable to pay the costs.

EPA's hazardous waste regulations define otherwise exempt or excluded secondary materials as solid wastes if they are "accumulated speculatively." A secondary material is not accumulated speculatively if the person accumulating the material can show that the material is potentially recyclable and that there is a feasible means for recycling it. To avoid triggering the speculative accumulation rule, facilities also must be able to show that, during the calendar year (commencing every January 1) the amount of material that is recycled, or transferred to a different site for recycling, equals at least 75 percent by weight or volume of the amount of material accumulated at the beginning of that period. If those conditions are not met, EPA defines the material as solid and potentially hazardous waste, subject to all applicable RCRA requirements.

The Task Force recommends modifying the speculative accumulation provisions to allow accumulation of exempt/excluded secondary materials at Category B (on-site) facilities for 18 months and at Category C and D (off-site) facilities for 12 months. The 12 or 18 month limit on storage without a permit begins on the first day of storage. However, we do not believe that a facility should be required to empty its storage units every 12 or 18 months. Instead, during each period of 18 months or less, the amount of material accumulated on-site at the end of the period must be equal to or less than the amount of material accumulated on-site at the start of the period.

Facilities would not be required to compute "rolling averages." Rather, they would be required to compute operating log entries of when the storage began and to show through

accounting procedures (e.g., first in, first out) that materials recycled equaled the material received.

In effect, the Task Force is proposing to shift from a "snap shot" approach to a mass balance or flow process approach. The facility would be required to provide the necessary documentation that an amount equal to 100 percent of the secondary materials stored in the previous 12 or 18 months was removed from storage. However, we continue to seek suggestions on alternative procedures which would accomplish our goal.

The Task Force believes that the new system provides sufficient controls to prevent mismanagement of materials accumulated within the recommended time limits. In general, our recommended approach requires that storage in Categories B-D meet the same management standards applicable to storage by generators or TSDFs in the current system.

As part of this new system, Category B-D recyclers must notify EPA or the State that they intend to accumulate recyclable materials for more than 90 days and document in their operating logs the amounts and types of materials stored. All storage is subject to the standards for tanks or containment buildings described earlier in this section; recyclers would be required to maintain proper operating and labelling records describing the date accumulation began.

We have recommended a longer allowable accumulation period for on-site facilities because some specialty chemical and pharmaceutical manufacturers use batch (rather than continuous) processes. Representatives of these firms told us that their normal production cycles may run as long as 18 months between batches of the same product. They believe that the current 12-month speculative accumulation limit discourages recycling of off-specification materials.

It is not clear how much safe recycling is affected by the 12 month limit for on-site accumulation of exempt or excluded materials without a permit. We intend to investigate this issue, and to consider other options such as a rebuttable automatic 6-month extension of the 12-month limit for Category B facilities.

We do not believe that facilities recycling materials generated off-site should be allowed to accumulate the materials without a permit for longer than 12 months. These recyclers should not accept shipment of materials to their facilities if they cannot recycle the materials within 12 months.²⁰ In previous years, excessive accumulation by off-site recyclers (especially commercial recyclers) resulted in the contamination of several large sites, requiring remediation by the Superfund program. We believe that the speculative accumulation limit of 12 months for off-site facilities will help prevent a repetition of such contamination.

Although RCRA requires permits for treatment or storage of hazardous wastes, generators may accumulate or treat hazardous wastes on-site in tanks, containers, and containment buildings for up to 90 days without a permit. EPA believed this would reduce the volume of wastes sent off-site for treatment or disposal and avoid the need to develop permits for

²⁰Actually, the current rules can allow up to 24 months. Because the rules only apply to materials present on January 1 of each year, materials received on January 2 will not be counted until the following January 1. At that point, 75% of the materials need not be recycled or disposed of for another 12 months.

hundreds of thousands of generators. The wastes that generators accumulate or treat are subject to certain management requirements for tanks, containers, or containment buildings, including secondary containment and release response.

The Task Force recommends allowing recyclers to accumulate all recyclable materials (including hazardous wastes) for 18 months on-site and 12 months off-site without having to obtain a RCRA permit. However, the accumulation of hazardous wastes must take place in RCRA tanks, containers, or containment buildings. Since we have recommended that RCRA recyclers who store regulated wastes for more than 90 days be required to notify the State or EPA of their intent to recycle, the regulatory agency will be aware of the potential accumulation and can conduct inspections as appropriate. The tank, container, and containment building standards will provide adequate protection against releases.

Recycling Unit Standards

Recycling units (not storage units) processing secondary materials are currently exempt from most hazardous waste regulations. In the past, EPA has been reluctant to subject recycling units to all the requirements of the hazardous waste program, out of concern that these requirements would inhibit recycling. As a result, the Agency has deferred some decisions on the appropriate regulatory requirements to apply to these units.

We believe that the tailored regulatory approach described in this report balances the need to protect human health and the environment with the need to remove significant economic impediments to safe recycling. Therefore, **the Task Force recommends** that all recycling units at Category B-D facilities should be subject to the same management standards as accumulation units (40 CFR Part 265, Subpart J). Units (not otherwise exempt) that produce only "clean fuels" or commercial chemical products that are used in fuels (and that is their normal manner of use) should be classified as manufacturing units rather than recycling units.

We do not believe that the Agency should specify design or operating procedures for specific recycling processes; rather, it should ensure only that unsafe materials will not be released to the environment. Recyclers should be afforded the same flexibility to improve their production processes as manufacturers of virgin products. Otherwise, it is unlikely that these facilities will be able to compete successfully in a marketplace that demands continuous improvements in efficiency and flexibility to adapt to changes in market or regulatory demands.

Modifications

To successfully adapt to changing demands, facilities currently subject to RCRA permits must continually make changes to their operations. Because these changes often affect their RCRA permit, EPA established the permit modification process. The process differs, depending on whether the modification was initiated by the permitting authority or by the permitted facility. If the permitting authority initiates the modification, it must follow administrative and public involvement requirements comparable to the full permitting process.

If the permitted TSDF initiates the modification, requirements vary, depending on how substantially the modification changes the conditions of the original permit. Three classes of permit modifications exist for changes initiated by the permitted facility. These are:

Class 1: Routine modifications and correction of errors, such as changing typographical errors, upgrading plans and records maintained by the facility, or replacing equipment.

Class 1 modifications involve only simple administrative procedures. The permittee may make the changes without the approval of the authorized permitting agency. However, the permittee must notify the authorized permitting agency by certified mail or other means within 7 calendar days after the change is put into effect. This notice must specify the changes being made to permit conditions or supporting documents referenced by the permit and must explain why the changes are necessary.

Within 90 days of implementing a change, a facility making a Class 1 modification also must notify all parties on its mailing list of the change. Any member of the public may ask the permitting agency to review the modification request. The permitting agency may deny the request.

Class 2: Common or frequently occurring modifications needed to maintain a facility's capability to manage wastes safely or conform to new requirements.

Before making Class 2 modifications, the permittee must submit a request for approval of the change to the permitting agency. The request must describe the change, explain why it is needed, and provide information showing that the change complies with EPA's or the State's technical standards for the facility. Unless the permitting agency specifically requests a delay, a facility may begin construction 60 days after submitting the Class 2 notice.

As part of the Class 2 modification process, the permittee must notify everyone on the facility mailing list of the proposed change by letter **and** publish a notice in a major newspaper. The notice must appear within 7 days before or after the facility submits the request to the permitting agency. The newspaper notice marks the beginning of a 60-day public comment period and announces the time and place of an informal public meeting.

Class 2 modifications require additional steps in the review process not required for Class 1 modifications. After the permitting agency receives written comments, it can review the modification request and extend the review period by an additional 30 days. If the permitting agency does not deny or approve the proposed modification during the extended 30-day review, the facility may begin operating under the modified conditions for 180 days. Within that 180-day period, however, the permitting authority still has the option of approving or denying the modification. If the permitting authority has not denied the proposed Class 2 modification 250 days after it was submitted, the public must be notified that the modification will become permanently authorized unless a decision to deny it is made within 300 days.

Class 3: Major modifications that substantially alter the facility or its operations, such as management of different wastes that require different designs or management practices. Modifications under this class are subject to initial public notice and meeting requirements as well as permit issuance procedures.

For Class 3 permit modifications, the process resembles that for a new Part B permit. There is a 60-day public comment period on the application, followed by preparation of any conditions on the permit modification by the permitting agency, notification to the public of the permitting agency's draft decision, a second public comment period, a public hearing (if requested), and a formal announcement of approval or denial of the application for the modification.

EPA developed these classes of permit modifications to tailor the degree of regulatory oversight and public participation to the potential risk of the change. Because of the

requirements for permitting agency review and public involvement, modifying permits is time-consuming for all except Class 1 modifications.

The Task Force recommends a simpler administrative process for facilities planning to modify their recycling operations. We believe that most types of recycling facilities should notify their EPA Region or State of modifications in their Biennial Report. Only Category D (commercial) recycling facilities undergoing a major²¹ modification would be required to obtain prior regulatory agency approval, unless the change would cause the facility to be defined as a Category D facility for the first time. In these cases, the facility would follow the prior approval procedures established for new Category D facilities.

The Task Force believes that most facility modifications of recycling operations can be addressed effectively by using the EPA/State biennial reporting process. Once identified, EPA or State personnel can target a facility for inspection to verify the successful modification. States with annual rather than biennial reporting requirements can choose to be notified more frequently of any modifications.

Our discussions with industry revealed that the current modification procedures are among the biggest impediments to hazardous waste recycling. They view the current process as so slow and uncertain that companies cannot plan and operate effectively. In particular, companies cited the necessity of installing new equipment (pumps, tanks, or processing equipment) to improve efficiency, respond to market demands, or simply to replace old equipment. In most cases, this equipment does not alter the capacity, basic process chemistry, or raw materials used. We believe that our recommended approach will increase operational flexibility without reducing the States' or EPA's ability to review modifications that could significantly increase risk to the public.

Closure Procedures and Financial Assurance for Closure

EPA's hazardous waste regulations include requirements for closing hazardous waste facilities and caring for the facilities after they are closed. "Closure" is the process during which hazardous waste is removed, if possible, from a hazardous waste management unit or facility, and any contamination to the equipment, facility, or to soil or ground water is addressed. Closure may be partial or final: one unit or the whole facility may be involved, the facility may be ceasing business entirely, or it may be only ceasing its hazardous waste management activity. RCRA requires closure activities to ensure that previous management of hazardous waste does not endanger human health or the environment.

Two kinds of closure are may be performed, depending on the type of waste unit and facility status. A unit may be "**clean closed**" if the TSD or generator can remove all hazardous wastes from the unit and decontaminate it. Units that are clean closed have no requirement for post-closure care. For some units, such as tank systems or drip pads, clean closure **must** be attempted; for others, it is an optional alternative to closure with post-closure care. **Landfill closure** or "**closure as a landfill**" involves leaving the waste in place and installing an engineered final cover to minimize the generation and release of leachate during the post-closure care period. "**Post-closure**" is generally a 30-year period following the completion of closure

²¹Major changes would significantly increase capacity, add new secondary materials to those previously approved, or alter the recycling process chemistry.

activities during which TSDFs or generators must monitor and maintain units with wastes left in place to prevent releases of hazardous constituents.

The closure requirements have three main parts:

Subpart G closure performance standard (explained below). The performance standard is the most important part of the closure requirements and applies to all closure activities.

Procedural requirements. Subpart G establishes the timing of closure and post-closure and the requirements to develop and obtain approval for closure and post-closure plans.²²

Technical and design standards. Parts 264 and 265, Subparts I through O, W, X, and DD, provide closure requirements that apply to specific RCRA hazardous waste management units.

Neither the general standards nor the technical standards supersede the other; facilities must meet both. TSDFs and generators may need to go beyond the technical standards in some cases to meet the general performance standard.

Closure requirements apply to all TSDFs, while post-closure requirements apply to TSDFs with land disposal units (including landfills and some types of waste piles and surface impoundments) and tanks, drip pads, or containment buildings that cannot clean close. Technical standards for specific units include both closure and post-closure for some units, closure alone for some, and an option of clean closure or post-closure care for others.

Requirements for closure and post-closure of permitted and interim status TSDFs are described in 40 C.F.R. Parts 264 and 265, Subpart G, respectively. Closure and/or post-closure requirements for specific waste management systems, such as containers, tank systems, landfills, and incinerators, appear in Subparts I through O, W, X and DD of Part 264 and Subparts J through Q, W, and DD of Part 265. Part 266, Subpart H, incorporates by reference the Part 264 closure and post-closure requirements applicable to boilers and industrial furnaces (BIFs) burning hazardous waste.

Subpart G requirements for both Parts 264 and 265 include requirements to prepare closure and post-closure plans that describe in detail all activities to be performed during the closure and post-closure periods. The plan estimates the cost of closing the facility if a third party performs closure. A facility must provide financial assurance in this amount — through a surety, letter of credit, corporate guarantee, etc.

Closure and post-closure plans must be approved by the regulatory agency; this often requires a significant investment of resources for both TSDFs and the environmental agencies as the plan is reviewed and revised. Permitted facilities must obtain this approval as part of the permit process, while interim status facilities submit plans for approval during the closure notification process.

²²These plans are closely linked to requirements for financial assurance under 40 CFR Parts 264 and 265, Subpart H (see background paper on financial responsibility).

Generators generally may accumulate hazardous wastes in containers, tanks, and drip pads without a storage permit. Unless these generators accumulate less than 100 kg of hazardous waste on site per month, however, they must comply with the two most important closure requirements: the closure performance standard (40 C.F.R. § 265.111) and disposal or decontamination requirements (40 C.F.R. § 265.114). They also must comply with most Part 265 closure standards for tanks and drip pads. Unlike TSDFs, these generators need not develop detailed closure plans and obtain approval for them. However, generators who accumulate hazardous waste on site for longer periods than specified by the RCRA regulations are considered storage facilities. They must meet all closure and post-closure requirements of Parts 264 and 265.

In our discussions, we have found relatively broad support (including industry representatives) for requiring clean closure for recycling units. Because the new system prohibits land storage, emphasizes prevention, and requires secondary containment for tanks and container storage areas, most of the generators we consulted did not believe clean closure would be difficult.

However, industry considers preparing and submitting closure **plans** to be costly and inefficient. A facility initially submits a closure plan primarily to provide the regulatory agency with a cost estimate for closure. Few first versions of closure plans could be used by a third party to close the unit or facility. Instead, the agency and the facility review and revise numerous versions before the plan is approved. When the facility decides to close the unit or facility years later, the plan usually must be revised before initiating closure. Although a facility must regularly update the plan to adjust the cost estimate, many technical aspects must be revised when the plan is implemented.

To remedy this problem, **all** participants in our Roundtable discussions favored dispensing with the plan until the time for closure. This was the only item on which there was uniform agreement. They also suggested adopting a "cookbook" approach to closure cost estimates. We agree with this approach. **The Task Force recommends** that the Agency develop a guidance document of conservative cost estimates based on the historical cost of closing particular units. Instead of a closure plan, the facility would submit a work sheet calculating the closure cost estimate, tailoring it to the units and characteristics of the specific facility.

Spill Response and Corrective Action

When Congress amended RCRA with the Hazardous and Solid Waste Amendments of 1984 (HSWA), it expanded EPA's corrective action authority and responsibilities. The RCRA corrective action program addresses releases of hazardous wastes and hazardous constituents from any solid waste management unit at a TSDF. Section 3004(u) of RCRA now requires that any permit issued to a TSDF after November 8, 1984, address corrective action for releases of hazardous wastes or hazardous constituents to any medium from any solid waste management unit at the facility. The corrective action responsibility applies to facilities subject to the RCRA permitting requirements, including operating permits for new and existing facilities and post-closure permits for land disposal facilities. In addition, Section 3004(u) requires that permits include assurances of financial responsibility for complying with corrective action. Section 3004(v) of HSWA authorizes EPA to require corrective action beyond the facility boundary where appropriate. Section 3008(h) authorizes EPA to require corrective action or other necessary measures when there is or has been a release of hazardous wastes from an interim status TSDF.

EPA has codified certain statutory terms, the interim status corrective action authority of § 3008(h), and EPA's authority beyond the facility boundary of § 3004(v). In July 1990, EPA proposed 40 C.F.R. Part 264, Subpart S, a comprehensive regulatory framework for implementing corrective actions at RCRA facilities. Subpart S contains a detailed set of technical requirements and procedures for investigating and responding to environmental releases at RCRA facilities. Two parts of the proposal affecting the regulatory status of remediation wastes have been finalized. States and EPA regional offices use the rest of Subpart S as guidance in making site-specific decisions, although it is not a final rule.

Subpart S regulations organize corrective action into four stages: the RCRA Facility Assessment; the RCRA Facility Investigation; the Corrective Measures Study; and the Corrective Measures Implementation. Each stage acts as a screen, either allowing facilities to leave the process or sending them to the next stage for more detailed review by the State or EPA.

A RCRA Facility Assessment is the first step in corrective action. The purpose of the assessment is to identify actual or potential releases from all solid waste management units. It includes (1) a file review of available information on the site; (2) a visual site inspection; and (3) in some cases, a sampling visit. This assessment determines whether sufficient evidence of a release exists to require the permitted or interim status TSDF to undertake more detailed investigations. If, after completion of the assessment, it appears likely that a release exists, the Agency either compels corrective action by developing a schedule of compliance in the RCRA permit, or issues an order pursuant to Section 3008(h).

The second stage of the corrective action process is the RCRA Facility Investigation. Its purpose is to characterize the nature, extent, and rate of releases to the air, soil, or water. Investigations may include characterization of the environmental setting at the facility, characterization of solid waste management units from which releases have been or may be occurring, and descriptions of potential human and environmental receptors. While the permitted or interim status TSDF is responsible for conducting the investigation, EPA oversees the work through review and approval of work plans, reports, and site inspections. Once the investigation is completed, the Agency evaluates the results and determines whether corrective measures are needed.

If cleanup is required, the TSDF must conduct a Corrective Measures Study. The purpose of the study is to identify a remedy or several alternative remedies for the contamination at the facility. A study will most likely be required if concentrations of hazardous constituents in the groundwater, surface water, soil, or air exceed "action levels," or triggers, for the given environmental medium.

Using the cleanup remedies identified in the study, the State or EPA ultimately selects the remedy that best addresses the contamination at the facility. Five factors are considered when selecting a remedy: long-term reliability and effectiveness; reduction in toxicity, mobility, or volume of wastes; short-term effectiveness; ease of implementation; and cost. Once the regulatory authority selects the remedy, it either issues a 3008(h) order or modifies the facility's permit to incorporate the remedy. Because selecting a remedy is a major decision in corrective action, the public is provided an opportunity to review and comment on EPA's preliminary decision or appropriate remedial activities at the facility.

The final step in corrective action is implementation of the remedy by the permitted or interim status TSDF with regulatory agency oversight. During this stage, TSDFs are required to design, construct, operate, maintain, and monitor the selected remedies. The remedy is considered complete when the State or EPA determines that (1) all media cleanup standards have

been met; (2) the actions required to control the source(s) of contamination have been taken; and (3) all procedures for removal, decontamination, closure, or post-closure care of units have been complied with.

The Task Force recommends no facility-wide corrective action for any recycling facility in Categories A through D. However, we believe facilities currently subject to corrective action requirements should remain subject to those requirements. Facilities with existing part B permits might be allowed into the new recycling system if the State certified that they had completed all necessary cleanup requirements, or if the State found no releases during the RCRA facility assessment/investigation phase.

In our recommended system, recyclers must report and clean up spills from recycling units (including accumulation areas), but need not conduct a facility-wide investigation (unless required by the State). We believe that the spill response requirements can be modeled after those established for tanks at hazardous waste generator facilities. These spill response requirements (see 40 C.F.R. § 264.196) have six major components:

- (1) Unit shut-down to immediately stop the flow of a recyclable material into the tank or secondary containment system, and inspection of the system to determine the cause of the release;
- (2) Removal of the material from the tank system or secondary containment system within 24 hours after detection of the release, or in as timely a manner as possible to prevent harm to human health and the environment;
- (3) Containment of visible releases to the environment, by conducting a visual inspection of the release and, based upon that inspection, preventing further migration of the leak or spill to soils or surface water, and removal and proper disposal of any visible contamination of the soil or surface water;
- (4) Reporting to EPA or the State any release to the environment within 24 hours, and submitting a report to EPA or the State within 30 days of detection of the release. The report must describe the extent of the release, its impact to surrounding soil, geology, hydrogeology; the results of any monitoring and sampling; proximity to downgradient drinking water; and a description of response actions;
- (5) Installation of secondary containment, repair or closure. Unless the recycler satisfies specific requirements described in the rules, the tank system must be closed;
- (6) Certification of major repairs by an independent, qualified, registered professional engineer.

Response procedures are self-implementing, but the facility is still held accountable for clean-up, including further spill clean-up that may be necessary if the regulatory authority believes previous actions were unsatisfactory.

States believe that adequate state or federal cleanup authorities exist to address major preexisting releases without requiring corrective action at recycling facilities. Superfund, RCRA § 7003 actions, State hazardous waste or hazardous substance laws, and property transfer laws currently enable most States to remedy existing contamination problems at RCRA facilities,

including recycling facilities. Some States have authority broad enough to require facility-wide cleanup similar to corrective action at manufacturing facilities with no hazardous waste activity.

Our recommended system reduces the potential for releases to the environment through prevention and banning land storage. Eliminating corrective action increases the incentive to recycle at manufacturing facilities that currently do not require treatment, storage, or disposal permits. Furthermore, we cannot reasonably expect additional benefits from requiring facility-wide corrective action at recycling facilities. Facilities with previous releases will not apply for a permit that would subject them to facility-wide corrective action. Since only clean facilities would seek a permit, States would still have to rely on authorities other than RCRA corrective action to address the contaminated sites.

Public Notice and Prior Approval

The current hazardous waste regulations prohibit building a new facility for the sole purposes of treating, storing, or disposing of hazardous waste without first submitting and obtaining a RCRA Part B permit from the EPA or State permitting authority. The RCRA permitting process is designed to allow detailed scrutiny of TSDFs by both the permitting authority and the public. Obtaining a permit involves (1) submittal of a Part A and Part B permit application by the applicant; (2) review of the permit application by the permitting authority; (3) preparation of a draft permit decision to issue or deny the permit; (4) public notice and comment; and (5) issuance of a final permit decision.

The Part B permit application is a detailed description of which hazardous wastes the facility intends to manage and how it intends to manage them from their entry to the facility to their treatment and disposal. More specifically, the permit applicant must describe in detail how it will meet the administrative and nontechnical facility standards of Subparts B through E of Part 264 (and described above under the General Facility Standards), as well as the general technical standards to prevent releases during operation and after closure (Subparts F through H), and the specific technical standards applicable to each waste management method (Subparts I through W, AA, BB, CC, DD). Many of these requirements and standards are discussed in this section.

As part of this process, the permitting authority usually conducts a review for completeness and accuracy, followed by a more detailed technical review of the application. This detailed review of the TSDF operations is time-consuming and expensive for the facility and the permitting agency. Often the applicant and the regulatory agency exchange information many times before the agency completes its review. Following the technical review, the permitting authority decides whether to prepare a draft permit or deny the application. Preparing the permit is another lengthy process, which requires developing both unit- and facility-specific conditions. The permit also may include a schedule of compliance for corrective action.

The federal hazardous waste rules require public involvement during permitting. The involvement is tied to various events in the permitting process. Upon receipt of a permit application, the permitting authority is required to develop a mailing list of interested parties. When the permitting authority issues the draft permit or notice to deny the application, it must also issue a fact sheet on the permit, and a public notice of the action. The permitting authority also must provide a public comment period and, if requested, conduct a public hearing. The public comment period and hearing give members of the public a chance to voice approval or disapproval of the permit decision (including any special conditions such as corrective action compliance schedules) and to offer ideas for alternatives to the permit decision.

The permitting authority considers all comments and issues a final permitting decision, either to approve or to deny the permit, based on the facility's ability to meet RCRA regulations. Final permits may be issued for an entire facility or for specific units at a TSDF. When the permitting authority issues the final permit decision, it must also issue a response to comments that specifies which provisions of the draft permit decision, if any, have been changed in the final decision and the reasons for the change. The response to comments must also describe and respond to all significant comments on the draft permit decision raised during the public comment period or during the hearing.

The Task Force recommends a departure from the current RCRA prior approval requirements. Under our recommended approach, no permit would be required for any Category B-D facility not already having (or required to have) a RCRA permit. Only Category D (commercial) facilities would require any prior government approval before beginning operation of a recycling operation. Instead, as part of its notification the recycling facility would have to certify to the State or EPA, before operations commence, that it is in compliance with the applicable standards. This certification of compliance ensures enforceability of all designated requirements for Category B-D facilities.

Even for commercial recyclers, prior approval would not involve reviewing all of the activities usually included in the Part B permit approval process. Four major elements would require prior approval by EPA or the State: (1) a recycling operations plan describing how the facility will recycle the secondary materials and the key operating parameters that will determine how materials will be processed;²³ (2) demonstration of financial assurance for closure; (3) demonstration of compliance with design requirements for tanks, containment buildings, or container storage areas; and (4) demonstration of no "toxics along for the ride." For all other requirements established by EPA's rules, a certification of compliance will be deemed adequate.

The Task Force recommends that public participation be required before operations commence at large Category C (captive/product stewardship) and all Category D (commercial) recycling facilities. Large (more than 12,000 kg/yr of secondary materials received) Category C recyclers would be required to notify the surrounding communities of an intent to receive and recycle secondary materials generated off-site. The community should have at least 30 days to request and inspect documentation of the types of materials to be recycled and the recycling processes to be used. This information would be obtained directly from the recycler, but recyclers would not be required to share confidential business information with the public.

If the members of the public later believe that the recycler has failed to meet the requirements for Category C, they may seek an enforcement action by the State or EPA, or file a citizen suit, as authorized by Section 7002 of RCRA. We believe that this level of public involvement ensures that the community will understand any new potential risks that may come about as a result of the transportation of secondary materials through the community.

Commercial recyclers would be required to obtain prior government approval for their recycling operations plan, financial assurance estimate, secondary containment, and major

²³This operating plan will include a chemical analysis plan showing which chemical parameters will be measured in the secondary materials and recycling processes and the frequency of measurement. Quality assurance and quality control procedures for chemical analysis also will be required.

modifications. They would be required to obtain prior approval for the TAR test only if requested by the State or EPA. Included in the formal approval process will be a comment period and opportunity for a hearing on a regulatory agency's draft determination to grant or deny a request for approval of commercial recycling operations. All public comments would require response in the final agency decision.

We believe that the formal approval process recommended for commercial recyclers reflects the greater level of public concern about the possible risks from recycling when the materials to be recycled may be generated far away and are transported to the community from a distance.

State Implementation

The Task Force recommends that States should have maximum flexibility and latitude to implement the new recycling program. They should have the opportunity to develop requirements that are different from federal rules if, on balance, the same degree of environmental protection is attained.

To bring about this flexibility, we believe that any necessary State authorization applications should be evaluated by EPA to ascertain whether the entire recycling program achieves environmental results similar to the EPA program, rather than comparing each component of the State program to its federal counterpart.

We also believe that States should have the flexibility to demonstrate that alternative State requirements are as environmentally protective as the EPA requirements. For example, a State may choose to work with a facility to identify less burdensome ways to prevent groundwater contamination, such as alternative frequencies of inspections or groundwater monitoring. In return, the State could choose to require more stringent design or operating procedures in other areas. We believe that EPA should work with the States to identify potential "trade-off" requirements.

States should also be able to make the final decision about which recycling category a facility is in, or whether a facility is exempt. This flexibility is particularly useful in situations where it is hard to distinguish continuous manufacturing from waste recycling. We believe that this will speed State decisionmaking, since States currently must be concerned about issues that may be raised by EPA.

Finally, States should be able to take into account the ease or difficulty of retrofitting existing facilities or units (such as recycling units) that were previously exempt under the RCRA regulations but that would be regulated under our proposed scheme. The Agency can work with the States to identify alternative requirements that ensure protection of human health and the environment.

RCRA HAZARDOUS WASTE RECYCLING: FULL SUBTITLE C

Under our proposed system, some recycling activities and materials would still be subject to full Subtitle C regulation. We believe that these activities and materials merit the full panoply of Subtitle C controls because of greater potential harm to human health and the environment. This class includes:

Recycling of used oil (current rules allowing special management unchanged).

Recycling of "inherently wastelike" materials:

Dioxins (40 C.F.R. § 261.2(d)(1)) and

Certain secondary materials fed to halogen acid furnaces
(40 C.F.R. § 261.2(d)(2)).

Waste-derived products containing "toxics along for the ride" ("TARs") or secondary materials containing TARs.

Recycling consisting of:

Landfilling or land storage and

Burning for destruction.

Other materials and activities identified by EPA in the future.

CHAPTER 6

INDUSTRY-SPECIFIC AND BASEL CONVENTION ISSUES

PETROLEUM REFINING

The Task Force has recommended exempting from RCRA hydrocarbon-bearing materials thermally processed at petroleum refineries. This exemption would be limited to intracompany transfers - i.e, the material to be processed would have to be generated at a facility owned by the same company that owned the refinery.

In addition, the exemption would not apply to materials used as direct feed to an asphalt plant, since normal industry practice does not include feeding materials to asphalt operations. This practice would entail higher potential for releases of any metals to groundwater through direct contact with the ground.

Some members of the petroleum industry have stated that the proposed exemption should be broadened to include intercompany transfers, as long as this exemption was limited to wastes from facilities in specific SIC codes that routinely generate and manage hydrocarbon-bearing materials. Examples of such facilities are:

- oil and gas extraction facilities
- production of industrial organic chemicals
- petroleum refineries
- crude oil and refined petroleum pipelines
- transmitters and distributors of natural gas
- operators of independent pipelines
- petroleum product bulk stations and terminals

The Task Force agrees that the exemption should be limited to the sources of secondary materials identified by the petroleum industry. However, we continue to believe that the proposed exemption for these wastes should be limited to intracompany recycling. The fact that a waste is generated by a facility from within a limited group of SIC codes does not necessarily ensure that enough information about the waste will be available to the receiving refinery to enable it to process the waste easily and safely. We believe that a thorough knowledge of incoming materials can be guaranteed only when the recycling refinery is part of the same company that generated the materials.

On July 28, 1994 [59 *Fed. Reg.* 38536, July 28, 1994], EPA promulgated a rule stating that recovered oil from petroleum refinery wastewaters and other sources is excluded from the regulatory definition of solid waste if it is subsequently inserted into the petroleum refining process before crude distillation or catalytic cracking. The rule was intended to respond to the decision in *AMC I* that ongoing manufacturing processes are not under RCRA jurisdiction.

This exemption includes recovered oil from off-site sources owned by a different company (examples are oil from other petroleum refineries, or from oil and gas drilling operations). However, in the preamble of the July 28, 1994 final rule [50 *Fed. Reg.* 38536, July 28, 1994], the Agency specifically pointed out that the proposed rule would **not** have exempted off-site materials, because the proposal covered a much broader category (**all** oil-bearing secondary materials, rather than just recovered oil). EPA allowed the exemption for recovered oil generated off-site because this material is essentially the same (in terms of physical composition and potential risk) as recovered oil generated on-site.

The Task Force's suggested exemption for secondary hydrocarbon-bearing materials, on the other hand, includes substances that can vary widely in physical composition and range of sources. The recycler may not be fully aware of the nature of his incoming material, unless it was generated by the same company. Although we will continue to evaluate this issue, we believe that limiting our exemption to intracompany transfers is the most prudent course, and is most consistent with current Agency policy.

Some industry representatives have suggested that our proposed exemptions should include secondary hydrocarbon-bearing materials fed into a coker plant. They argue that the current exemption for petroleum coke produced from oily hazardous wastes is revoked if the coke exhibits a hazardous waste characteristic, and that this qualification is sufficient to avoid contamination of the coke by heavy metals. Environmental groups, on the other hand, believe that the existing exemption for petroleum coke does not protect against mere dilution of metal wastes in the coking operation, or increased metal air emissions when the coke is burned as fuel.

In the final rule for recycled recovered oil published on July 28, 1994 [59 *Fed. Reg.* 38536, July 28, 1994], EPA did **not** exclude recovered oil put into a petroleum coker from the definition of solid waste. The Agency deferred this exclusion because it lacked data on the amount of hazardous constituents (especially heavy metals) from petroleum refinery wastes (including recovered oil) that actually ended up in the coke product. Specifically, EPA lacks sufficient data to show whether oil recovered from refinery wastewater treatment systems contains toxic metals that are not present in the normal feed to a coker. Such metals could end up in the coke product.

Since the Task Force also lacks data at this time about the possible effect of feeding secondary hydrocarbon-bearing materials to petroleum cokers, we do not recommend adding an exemption for these materials. Under our recommendations, therefore, these materials would remain regulated under RCRA when they are generated, transported, and stored before recycling into a coker.

It should also be noted that EPA has expanded the current exemption for petroleum **coke** produced from oil-bearing hazardous waste generated on-site (40 CFR § 261.6 (a)(3)(vii)). The current exemption states that such coke is subject to regulation only if it exhibits a characteristic of hazardous waste. The purpose of the exemption (based on section 3004(q)(2)(A) of RCRA) is to allow petroleum companies to recycle oily refinery waste to their petroleum coker, without automatically subjecting the coke output to the rules for hazardous waste fuels.

The final rule, published on July 28, 1994 [59 *Fed. Reg.* 38536], would expand this exemption to include petroleum coke produced from oily hazardous waste generated by an **off-site** facility, as long as that facility is owned by the same entity that owns the coker. EPA expanded the exemption because there is no difference in the composition of coke produced partially from on-site and off-site hazardous wastes, when the coke is produced by the same entity.

The Task Force has also proposed to exempt the blending of secondary materials containing hydrocarbons into commercial-grade gasoline at a petroleum refinery. Petroleum refiners have suggested that this exemption be extended to include blending at petroleum distribution facilities, since these facilities routinely blend secondary hydrocarbon-bearing materials. We believe, however, that determining when potentially improper fuel blending is occurring would be very difficult at a distribution center, since these facilities are not typically inspected as part of the RCRA compliance program. It would be administratively difficult to

begin proper inspection at the many locations where blending of gasoline takes place. We believe the risks of improper blending require that the regulatory agencies restrict this activity to a relatively small number of locations, and that those locations (refineries) be the sites most likely to have the technical expertise to ensure that safe products are produced. Therefore, we will continue to recommend that this exemption be limited to blending conducted at petroleum refineries.

Environmental groups have also suggested that the exemption be limited to particular waste streams effective as octane enhancers, which is normally the stated reason for such blending. They believe that commercial specifications for gasoline do not cover the potential contaminants to which the public might be exposed. Petroleum refiners argue that current industry specifications for gasoline are enough to ensure that the blended gasoline does not contain significant amounts of toxics. We agree that refiners are unlikely to accept materials that will contaminate the ultimate product or significantly increase air or water emissions. Therefore, we are recommending that the exemption be limited to octane enhancers.

USED ANTIFREEZE

Used antifreeze is generated by auto service centers and quick-change oil outlets when coolant is drained and flushed from automotive radiators. It is collected and recycled to recover ethylene glycol, which is sold for production of automotive antifreeze. Because used antifreeze can fail the toxicity characteristic leaching procedure for lead, it may need to be managed as a hazardous waste. Therefore, if used antifreeze is hazardous, it must be transported under a manifest to a permitted storage facility (unless it is generated in amounts less than 100 kilograms per month). This increases the costs of recycling and makes the recycled antifreeze more costly than new antifreeze.

Producers of antifreeze and the radiator service industry support more tailored management standards for recycled antifreeze than the current requirements of Subtitle C. They believe that management standards tailored to the specific risks of antifreeze would facilitate recycling of this valuable material rather than disposal. Ethylene glycol recovered from used antifreeze can be used in place of virgin ethylene glycol in making new antifreeze. In addition, recycling would discourage disposal of this material into publicly owned treatment works.

EPA has proposed streamlined requirements under Subtitle C for the collection and handling of certain "universal wastes," such as hazardous waste batteries and certain recalled pesticides. The Agency has also solicited comment on whether these streamlined requirements are appropriate for used antifreeze.

The industry plans to supply the Agency with data stating why the RCRA recycling requirements recommended by the Task Force would continue to discourage antifreeze recycling, along with life-cycle analyses and cost-benefit data on increased recycling in the absence of the current RCRA regulations. Until we have evaluated these data, we will not make specific recommendations with respect to special management standards for antifreeze recycling facilities.

SOLDER MATERIALS

Industry frequently uses the term "dross" to refer to oxide skimmings that form on the surface of molten metal, regardless of whether the metal is a virgin metal being reshaped into a different form, or is a metal in use (such as solder). Solder dross often contains high concentrations of tin and lead. It is recycled to extract tin or lead for resale, as well as to produce

commercial products. Recyclers have expressed substantial confusion about the regulatory status of solder dross and related reclaimed materials.

Some drosses are by-products under federal rules (and thus are not solid or hazardous wastes when reclaimed). However, the circumstances of a material's use, including whether the material becomes contaminated, determine whether it is classified as a by-product or a spent material. EPA has stated that drosses generated from soldering printed circuit boards are treated as by-products rather than spent materials, and do not have to be managed under RCRA regulations when they are reclaimed. The Task Force has not reevaluated these specific determinations for the purpose of this report.

Some generators cannot easily determine whether their materials are a by-product or a spent material under RCRA. Others question why these materials should be regulated differently from virgin materials when they are managed the same way, and may contain almost the same concentrations of hazardous constituents. Some potential solder recyclers are particularly concerned about hazardous waste transportation costs. They believe that compliance with DOT rules on shipment of hazardous materials is sufficient to ensure environmental safety. The Task Force and the States agree that these and many other recyclable materials may safely be shipped under these rules through use of a recyclables manifest, and have recommended this approach, as discussed in Chapter 5 of this report. Therefore, it appears the issue raised may not be a serious problem if our recommended approach is promulgated. Even if the materials are classified as spent materials, we believe the requirements are reasonable and acceptable to the industry.

LAUNDERED RAGS AND DISPOSABLE WIPES

Because of the mixture and derived-from rules and at times the TCLP toxicity characteristic, reusable rags and disposable wipers are defined on occasion as solid and hazardous wastes and are subject to full Subtitle C regulation. Industry has asserted that, when these materials are managed or disposed of in accordance with management practices established by the industry, the actual risk of harm is minimal.

Manufacturers of disposable wipers state that they contain only *de minimis* amounts of hazardous waste when managed properly. Additionally, launderers of reusable rags state that any hazardous constituents in the rags are subject to regulation under the Clean Water Act. States and EPA regions differ greatly in applicable definitions and implementation of requirements.

Manufacturers of disposable wipers and launderers of usable rags have supported a conditional exemption from the regulations for their products when they are managed safely. Appropriate management standards supported by industry include ensuring that containers of rags or wipers are covered (during accumulation) and do not include free liquids, compliance with Clean Water Act pretreatment requirements during the laundering (recycling) of rags, and thorough cleansing of the reusable textiles before they are discarded.

The environmental community believes that any relief for disposable wipers should be based upon the concentration of hazardous constituents in the wipers. They do not believe that this is a recycling issue, and they suggest that these materials should be evaluated in the context of EPA's efforts to set concentration-based "exit" limits for hazardous wastes. With respect to reusable rags, they suggest exempting the rags from Subtitle C requirements only if any laundering process could be demonstrated to remove or destroy the hazardous contaminants effectively before reuse. They believe that before such treatment, the rags containing listed wastes or failing a toxicity characteristic should be managed as hazardous wastes.

The Task Force and States are aware that there are significant implementation difficulties associated with applying hazardous waste regulations to these materials (particularly in the case of small businesses). We also are aware that special recycling rules for reusable rags only may create a market advantage for these materials, which we could not currently justify; we do not have data to indicate that placing disposable wipers in secure landfills is necessarily riskier than discharging materials from laundered rags into sewers, even with Clean Water Act controls. We believe that rags and wipers managed in accordance with current industry guidance will probably present minimal risk, at least if they are contaminated with F001-F005 spent solvents (the most common listed waste found in the rags and wipers). We are not aware of any case of environmental damage resulting from the mismanagement of contaminated rags or wipers, despite the fact that these materials are not normally managed as hazardous wastes today. Therefore, we recommend clarifying that rags and wipes containing listed spent solvents are exempt from Subtitle C if the specific management standards described above are met.

WOOD PRESERVATIVE WASTEWATERS

At wood preserving facilities, wood is chemically treated and removed from a pressurized cylinder. Excess preservative, which is a listed hazardous waste, drips on a drip track or drip pad near the cylinder. The drip pad (a bermed, free-draining device) contains and collects the spent formulation, along with wastewaters (wash water, rainwater, snow) that may accumulate on the pad. Design standards and integrity assessment procedures for the drip pads are established as part of the hazardous waste program (40 C.F.R. Part 264 Subpart W).

In many facilities, these wastewaters are reclaimed and returned through a sump and piping for use in making a new preservative. This process recycles the wastewaters without any identified threat to the environment. The wood preserving industry has stated that classifying reclaimed and reused wastewaters (especially rainwater) as hazardous waste is inappropriate and results in the perception that large amounts of hazardous waste are generated. Several States tax the waste according to the total volume generated, rather than by the amount of new preservative reaching the drip pad.

The industry believes that these recycling practices are actually the functional equivalent of "closed-loop" recycling, which would be exempt under 40 C.F.R. § 261.2(e)(1)(iii) if the materials were not reclaimed. They argue that the "reclamation" taking place is merely minimal solids screening to remove dirt and debris that are incompatible with the manufacturing process. The environmental community, on the other hand, is concerned about the use of land-based units (such as drip pads) for this industry.

The Task Force is evaluating whether the term "reclamation" should include such practices as solids screening, settling, and simple filtration. Many industry observers have argued that these practices are incidental to most normal manufacturing processes. They believe that these measures should not automatically subject an otherwise exempt recycling operation to RCRA. As described earlier in this chapter, we are considering whether to adopt this recommendation.

If the Agency ultimately chooses to exempt "incidental processing" from the definition of reclamation, we will also consider altering the new no land storage condition recommended for "closed-loop" recycling. This change would allow wood preservers in compliance with Subpart W design standards to qualify as closed-loop recyclers of wastewater that is captured on the pad and returned to the process. This approach would require a determination that the concrete channels used to convey the water from the drip pad meet the definition of no land storage. We believe that these channels will meet the definition of a tank in 40 CFR §260.10.

BASEL CONVENTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was signed by the United States in March 1990. It is the first treaty exclusively devoted to the export and import of hazardous wastes. The Convention also covers municipal solid waste and municipal incinerator ash.

The Basel Convention was designed to ensure that environmental problems are not transferred from one country to another. The Convention helps to ensure this by reducing the generation and the transboundary movement of the wastes mentioned above (covered wastes) and by establishing environmentally sound management as the universal standard for those waste exports and imports that do occur.

Although the United States is a **signatory** to Basel, it will not be a **party** to Basel until we actually ratify the Convention. For the United States to ratify, Congress must enact legislation granting the authority to implement Basel's terms. In February 1994, the Administration issued its statement of principles for Basel legislation which, if enacted into law, would allow the United States to ratify the Convention.

By emphasizing waste minimization and limiting waste exports, the principles aim to make the United States even more self-sufficient in managing the waste it generates. The Administration has asked Congress to help achieve this goal by legislating an immediate ban on exports beyond North America (with a 5 year grace period for countries in the Organization for Economic Cooperation and Development, and with exceptions made only in very limited circumstances).

This ban would include the following wastes covered under the Basel Convention:

- o Hazardous waste that is identified or listed under section 3001 of the Solid Waste Disposal Act;
- o Additional wastes covered under the Convention:
 - Municipal solid waste;
 - Municipal incinerator ash;
 - Waste provided special status domestically under sections 3001(b)(2)-(3) of RCRA, if such waste exhibits a characteristic of hazardous waste identified under section 3001; and
 - Any waste identified in regulations promulgated by the President as necessary to implement the Basel Convention and any amendments thereto.

It should be noted that transboundary movements from the United States of certain commodity-like secondary materials for recycling (specifically scrap metal, paper, textiles and glass, when separated and exported for recycling) would not be covered by this legislation. In addition, the Administration has asked Congress to include in its implementing legislation a mechanism for the Executive Branch to identify other commodity-like recyclables that would be placed outside the scope of this legislation.

The principles of the Administration also call for a ban on the export and import of covered wastes to facilities where the United States government has reason to believe they will not be managed in an environmentally sound manner. In addition, the principles include strong enforcement authority that would allow the return of illegally exported or mismanaged covered waste to the United States and the prosecution of those who violate United States law.

Many recommendations made by the Task Force involve special management conditions for recycled hazardous waste (we are recommending no changes in the current exemption for scrap metal). We are still evaluating legal mechanisms to implement this concept. One mechanism might be conditional exemptions for recycled materials, under which an otherwise hazardous material would not be considered hazardous waste if it were managed under the specific conditions.

If the contingent management approach is adopted, it may be reasonable to include **domestic** management of the waste as one of these specific conditions. These materials would not be regulated as hazardous waste domestically but would be considered hazardous wastes when exported. Some likely candidates for this status would be hazardous wastes from small quantity generators, hazardous wastes from lab samples, and lead acid batteries.

In viewing our domestic program in the context of the Basel Convention, it is also important to realize that whatever we decide to do domestically, our waste exemptions do not necessarily apply when the hazardous material is exported. Should we exempt a hazardous material from regulation domestically and from export regulation under special conditions relating to how the material is managed (e.g., scrap metal), it is still possible that an importing country may control the material as a Basel waste under its domestic legislation. In such cases, the importing facility or country may require various safeguards and documentation that the United States may consider unnecessary. The United States exporter is nevertheless obligated to comply with any such requirements.

APPENDIX A

JURISDICTION

Congress' "overriding concern" in enacting RCRA was a national system to ensure the safe management of hazardous waste. However, the scope of EPA's Subtitle C authority has always been controversial. From the beginning, the regulated community questioned EPA's RCRA jurisdiction over any recycling activities. Some argued that recyclable materials cannot be wastes under RCRA.¹ Others argued that, even if recyclable materials could be defined as wastes, Congress did not intend to give EPA jurisdiction to regulate hazardous waste recycling. The controversy prompted EPA to explain its legal rationale for asserting its authority in the next major proposed definition of solid waste, published April 4, 1983.² Citing statutory provisions, legislative history, and court interpretations, EPA concluded that recycled materials can be hazardous wastes under RCRA, and that recycled hazardous wastes can be regulated under Subtitle C regulations.

This conclusion is fully in accord with the statutory language and the legislative history. It is also in accord with the paramount policy objective of the statute to control management of hazardous waste from point of generation to point of final disposition. The Agency's reading also has substantial support in judicial precedent. We thus conclude that we possess jurisdiction to regulate recycling of hazardous waste under Subtitle C and the implementing regulations.³

In the legislative history of HSWA, the House Committee on Energy and Commerce affirmed EPA's existing authority over the use, reuse, recycling, and reclamation of hazardous wastes and clarified that materials managed in those ways "can indeed be solid and hazardous wastes . . ." H.R. Rep. No. 198, 98th Cong., 2d Sess. 46 (1984), reprinted in U.S.C.C.A.N. 5605.

Although everyone now recognizes EPA's RCRA jurisdiction over hazardous waste recycling, the debate continues over its scope. Delineating that authority has been difficult because EPA must balance the two sometimes conflicting goals of RCRA — conserving valuable material and energy resources and protecting human health and the environment. EPA's most comprehensive attempt to balance these goals is the regulatory definition of solid waste promulgated January 4, 1985.⁴ Representatives of the petroleum and mining industries challenged on this regulatory definition in *AMC I*. Although the rule exempted many solid wastes generated from smelting and refining ores and minerals, the rule still regulated certain recycling practices of these industries.

¹See comments in response to the first set of regulations implementing the Resource Conservation and Recovery Act of 1976 (and the first rule to address hazardous waste recycling). Hazardous Waste and Consolidated Permit Regulations, 45 *Fed. Reg.* 33066 (May 19, 1980).

²See Hazardous Waste Management System; Proposed Rule, Appendix A, 48 *Fed. Reg.* 14472, 14502 (April 4, 1983).

³48 *Fed. Reg.* at 14505 (April 4, 1983).

⁴50 *Fed. Reg.* 614 (January 4, 1985).

The petroleum refining process generally starts by distilling crude oil into various hydrocarbon "fractions," which are then blended or combined to make different products. Any fractions not usable in their present form are returned to some previous stage in the refining process. Materials that escape from the refining process are also captured and returned to a previous stage. The petroleum industry challenged EPA's regulation of the materials returned to the refining process. Similarly, in the mining industry and in primary metals production, various metals are extracted from the mineral ore in a series of processing steps. Materials are often returned to earlier stages of the processing to extract as much metal as possible. The mining industry challenged EPA's regulation of the reprocessed ore and the metal derived from it.

Generally, the courts give substantial deference to an agency's interpretation of its statutory authority and responsibilities.⁵ They apply a two-part test to measure the validity of an agency's statutory interpretation — first, whether Congress' intent is clear, and second, whether the agency's interpretation is reasonable.⁶ Applying the *Chevron* test, the *AMC I* court first asked whether Congress' intent to assert RCRA jurisdiction over certain materials is clear. Relying on the dictionary, the statute, and legislative history, the court decided that Congress used "discarded" in its ordinary sense — "disposed of" or "abandoned" — which does not include materials destined for immediate reuse in another phase of the industry's ongoing production process. *AMC I* also recognized RCRA's dual purposes but concluded that, to fulfill these purposes, EPA need not regulate "spent" materials that a facility recycles and reuses in an ongoing manufacturing or industrial process.⁷ Because the court found "clear Congressional intent to extend EPA's authority only to materials that are truly discarded, disposed of, thrown away, or abandoned," it did not apply the second prong of the *Chevron* test.

Although in 1987 (*AMC I*) a plurality of the D.C. Circuit found "RCRA's statutory language unambiguous,"⁸ different panels of the same court later reached a different conclusion.⁹ In *API* and *AMC II*, the court unanimously agreed that the term "discarded" in RCRA's definition of "solid waste" is "marked by the kind of ambiguity demanding resolution by the agency's delegated lawmaking powers."¹⁰

⁵In *AMC I*, however, the court observed that EPA's interpretation of the scope of its authority has been "unclear and unsteady." Under "settled doctrine," the court gave the Agency's interpretation "considerably less deference" than it would otherwise be entitled. 824 F.2d at 1182.

⁶See *Chevron U.S.A., Inc. v. Natural Resources Defense Council*, 467 United States 837 (1984).

⁷824 F.2d at 1186.

⁸824 F.2d at 1190.

⁹*American Petroleum Institute v. United States Environmental Protection Agency ("API")*, 906 F.2d 729 (D.C. Cir. 1990), and *American Mining Congress v. United States Environmental Protection Agency ("AMC II")*, 907 F.2d 1179 (D.C. Cir. 1990).

¹⁰906 F.2d at 740-41; 907 F.2d at 1186.

In *API*, environmental groups and the treatment industry challenged EPA's "First-Third Rule" prohibiting land disposal of and establishing treatment standards for "First-Third" scheduled wastes. EPA promulgated separate treatment standards ("best developed available treatment" (BDAT)) for high-zinc K061 (at least 15% zinc) and low-zinc K061 (less than 15% zinc). The Agency determined that high temperature metal recovery was the BDAT for high-zinc K061. Based on its reading of *AMC I*, however, EPA believed it lacked authority to establish treatment standards for the slag residues from the metals recovery process. Because the furnaces used for reclaiming metals are also part of production, the Agency believed the activity was beyond its RCRA authority to regulate waste management.¹¹ The challengers claimed that EPA unlawfully exempted the slag residues from the land disposal restrictions.

The court agreed with the challengers, concluding that EPA had construed *AMC I* more broadly than it should have. "Unlike the materials in question in *AMC*, K061 is indisputably 'discarded' **before** being subject to metals reclamation. Consequently, it **has** 'become part of the waste disposal problem'; that is why EPA has the power to require that K061 be subject to mandatory metals reclamation."¹² Also, the court concluded, nothing in *AMC I* requires EPA to cease defining K061 as "solid waste" once it reaches the reclamation facility. Since the K061 is sent for recovery as part of a mandatory waste treatment plan, it is not delivered to the plant as part of an "**ongoing** manufacturing or industrial process" within "the generating industry." Instead, the K061 remains within the scope of the agency's authority as "sludge from a waste treatment plant."¹³

In a subsequent case, *AMC II*, the petitioners challenged EPA's relisting of six wastes generated from metal smelting operations as "hazardous." Primary smelters that generate these wastes produce large volumes of wastewater that must be treated before discharge. Often the smelters collect, treat, and dispose of the wastewater in surface impoundments, from which sludges precipitate. Relying on *AMC I*, the Petitioners argued that these sludges were not "solid wastes" because they are not "discarded," but are instead "beneficially reused in mineral processing operations."¹⁴ The court agreed with EPA's "expert judgment," however, that these materials **are** "discarded" because they are "the product of wastewater and are stored in surface impoundments that threaten harm to the health and environs of those living nearby."¹⁵

API and *AMC II* both conclude that EPA has RCRA jurisdiction over recycling practices that are "part of the waste disposal problem." Most people agree that a continuum exists from "ongoing manufacturing and industrial processes" to "recycling" to "treatment or disposal." Most also concede that EPA has no RCRA authority over activities at the manufacturing end and full Subtitle C authority over activities at the treatment and disposal end of that continuum. Disputes arise over the many activities that are often difficult to characterize wholly as manufacturing, recycling, or treatment or disposal.

¹¹53 *Fed. Reg.* 11,753 (1988).

¹²906 F.2d at 729.

¹³*Id.*

¹⁴907 F.2d at 1185.

¹⁵*Id.*

APPENDIX B

CURRENT RCRA DEFINITION

DEFINITION OF "SOLID WASTE"

In 1983, EPA proposed several ways to determine whether a material is a solid or a hazardous waste. The Agency finalized the rule in 1985, and it remains largely unchanged today. In determining whether a material is a solid waste, the Agency considers both the nature of the material and how it is managed.

"Solid waste" is currently defined in three parts:

Materials are **abandoned** by being disposed of, burned, or incinerated (or accumulated, stored or treated before one of these activities) are always solid wastes. 40 C.F.R. § 261.2(a)(2)(i).

Certain **inherently waste-like** materials are always solid wastes, even when they are recycled (i.e., listed dioxins or secondary materials fed to halogen acid furnaces). 40 C.F.R. § 261.2(a)(2)(iii) and (d).

Materials that are **recycled** may or may not be solid wastes, depending on the nature of the material and the recycling process. 40 C.F.R. § 261.2(a)(2)(ii) and (c).

Some materials have been expressly excluded from the definition of solid waste and therefore, are not subject to RCRA Subtitle C requirements. These exclusions appear in 40 C.F.R. § 261.4(a) and include:

- (a)(1) Domestic sewage and mixtures of domestic sewage and other wastes that pass through a sewer system to a publicly-owned treatment works (POTW) for treatment.
- (a)(2) Discharges regulated under the National Pollution Discharge Elimination System (NPDES).
- (a)(5) Materials subjected to in-situ mining techniques which are not removed from the ground as part of the extraction process.
- (a)(6) Certain reclaimed black pulping liquors.
- (a)(7) Spent sulfuric acid used to produce virgin sulfuric acid, unless it is accumulated speculatively.
- (a)(8) "Closed-loop" recycling in a totally enclosed system with piping and tanks.
- (a)(9) Certain spent and reused wood preserving solutions, and wastewaters from the wood preserving process.
- (a)(10) K087, and certain wastes from coke-by-products processes. The exclusion is conditioned on no land disposal of the wastes from the point of generation to the point of recycling.

Materials that are potentially solid and hazardous wastes are usually referred to collectively as "secondary materials," although the term does not appear in the regulations. EPA currently regulates four kinds of secondary materials:

A **spent material** is a material that has been used and, as a result of contamination, can no longer serve the purpose for which it was produced without processing (40 C.F.R. § 261.1(c)(1)). A common example is a solvent used to clean automobile parts, if it becomes so contaminated with dirt and grease that it can no longer be used for cleaning without processing.

A **sludge** is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility (exclusive of treated effluent from a wastewater treatment plant) (40 C.F.R. § 260.10)). Examples are sludge from a wastewater treatment process and baghouse dust from a primary metal smelter.

A **by-product** is a material that is not one of the primary products of a production process and is not solely or separately produced by the production process (40 C.F.R. § 261.1(c)(3)). An example is slag, which is formed when metals are heated during smelting. Chemicals, such as lime, are added to heated metal to aid in separating pure metal from impurities. The metals sink to the bottom of the bath and are removed. The impure residue is cooled and forms the rock-like "slag," which may be disposed of or used as aggregate in roadbeds.

The term "by-product" does not include "co-product" that is produced for the general public's use and is ordinarily used in the form it is produced from the process (40 C.F.R. § 261.1(c)(3)). Cadmium, for example, is often present in lead or zinc ore. Primary zinc smelters design their processes to extract the zinc and the cadmium. Ores are selected for their high cadmium content to extract this valuable co-product.

Commercial chemical products are chemicals manufactured or formulated for commercial or manufacturing use. They consist of the pure or technical grade of the chemical or of a formulation in which the chemical is the sole active ingredient. Commercial chemical products are listed in 40 C.F.R. § 261.33. An example is formaldehyde. Commercial chemical products are only considered secondary materials if they are recycled in ways that differ from their normal use. Otherwise they are products and are outside the scope of RCRA jurisdiction. However, if they are abandoned, they are characterized as solid and potentially hazardous waste.

Generally, EPA regulates materials and processes that resemble hazardous waste management. It does not regulate materials and activities that are more like products and ongoing manufacturing processes. Some recycling activities (such as immediately reusing secondary materials in the process that produced them) closely resemble normal production and are exempt. Other activities (such as burning hazardous waste fuels in a boiler or industrial furnace) are more like waste management and are fully regulated, with the recycled materials defined as solid and hazardous wastes. EPA's logic is demonstrated by its regulatory treatment of recycling activities. Materials recycled in ways that resemble ongoing manufacturing are not solid wastes, even if the recycled materials are spent materials, listed sludges or by-products, or scrap metal. A material is generally **not** a solid waste if it is:

Used or reused (without reclamation) **as an ingredient in an industrial process** to make a product (40 C.F.R. § 261.2(e)(1)(i)). An example is using distillation bottoms from carbon tetrachloride production as a feedstock to make tetrachloroethylene. A material will **not** satisfy this condition if distinct components of the material are recovered as **separate** end products (as when metals are recovered from secondary metal-containing materials (40 C.F.R. § 261.1(c)(5)(i)).

Used or reused (without reclamation) **as an effective substitute for a commercial product** (40 C.F.R. § 261.2(e)(1)(ii)). Examples are using spent pickle liquor as a wastewater conditioner or using spent solvent from electronics manufacturing as a degreaser for automotive parts without first processing the solvent.

Returned to the original process from which it was generated (without reclamation) (40 C.F.R. § 261.2(e)(1)(iii)). The material must be returned as a substitute for raw material feedstock, and the process must use raw materials as principal feedstocks. An example is returning solvent carriers from organic chemical production to the beginning of the process that generated them. This exemption is sometimes referred to as "closed-loop" recycling (not to be confused with the next exemption, also known as "closed-loop").

Returned to the original production process from which it was generated, with prior reclamation (40 C.F.R. § 261.4(a)(8)). This is often referred to as the "closed loop exemption. Materials recycled in this way are usually liquids (frequently organic chemicals). To qualify for this exemption, the materials must be stored only in tanks and for not more than one year before being reclaimed. The entire process through reclamation must be enclosed through pipes or other conveyances.

Secondary materials recycled in ways that more closely resemble waste management are almost always regulated as (or similarly to) solid wastes. Performing any of the following activities usually means that the material is a solid waste, **even** if it is used, reused, or returned to the original process as described above.

Burned for energy recovery, or used to produce a fuel.

Most hazardous secondary materials are solid and hazardous wastes when burned directly as a fuel, or when processed or blended to produce a fuel (40 C.F.R. § 261.2(c)(2)). The only exceptions are commercial chemical products intended for use as fuels (including off-specification fuels) and certain used oils. Although the Agency likens these activities to waste management, it distinguishes burning for energy recovery from burning simply to destroy the material.

Used in a manner constituting disposal.

Placing recycled material directly on the land, even after it is incorporated with other materials, is considered waste management; the recycled materials are solid wastes (40 C.F.R. § 261.2(c)(1)). Examples of this kind of reuse are:

- In fertilizers, pesticides, or to alter the physical structure of soils;
- To build marine habitats, such as coral reefs;

- As anti-skid material or for suppressing dust on road surfaces;
- As landfill cover material; or
- As construction material (e.g., as an ingredient in concrete or other paving materials; as highway fill, road base, building or residential fill material; or as construction material for retaining walls, levees, and berms).

Speculative accumulation.

Accumulating otherwise exempt secondary materials before recycling is considered waste management if the materials are stored for more than 12 months before they are recycled (40 C.F.R. § 261.2(c)(4)).

Note: Commercial chemical products recycled in any of the above ways are not solid wastes if the activity is the product's normal use. All other secondary materials **are** solid wastes when recycled in these ways.

Reclamation.

A fourth kind of recycling is considered waste management under certain circumstances. "Reclamation" is processing a secondary material to recover a usable product, or to regenerate the material.¹ Reclamation is considered waste management **only** when certain types of secondary materials are reclaimed. Spent materials, listed sludges and by-products, and scrap metal are usually considered solid wastes if they are being reclaimed, while characteristic sludges and by-products, and commercial chemical products are not (40 C.F.R. § 261.2(c)(3)).

DEFINITION OF "HAZARDOUS WASTE"

Hazardous waste is a subset of solid waste. EPA defines solid wastes as hazardous wastes in one of two ways: through listings or by characteristics.

Congress required EPA to list specific hazardous wastes based on "toxicity, persistence, and degradability in nature, potential for accumulation in tissue, and other related factors such as flammability, corrosiveness, and other hazardous characteristics."² EPA promulgated two different lists of hazardous wastes: those from non-specific sources, called "F wastes," listed in 40 C.F.R. § 261.31; and those from specific sources, called "K wastes," listed in 40 C.F.R. § 261.32. F001 through F005, for example, are different spent solvents and residues from their distillation. The F listings do not distinguish among the generating industries. K wastes, however, are from specific industry processes, such as K016 (distillation residues from the production of carbon tetrachloride) or K107 (column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines).

Once a secondary material is listed as a hazardous waste it remains a hazardous waste unless it is delisted by the Agency. Any mixture of a solid waste and a listed hazardous waste is

¹40 C.F.R. § 261.1(c)(4).

²42 U.S.C. § 6921(a) and (b).

itself a listed hazardous waste.³ Any residue from the treatment of listed waste is also a listed waste. These rules, known as the "mixture" and "derived-from" rules, have been the subject of recent litigation. EPA has convened a federal advisory committee to address the issue. The Hazardous Waste Identification Rule ("HWIR"), currently under development, would provide an "exit" from Subtitle C for certain low-risk materials. Wastes, residues, mixtures, and media-containing hazardous constituents below established concentration levels would no longer be defined or regulated as hazardous wastes. Many recyclable wastes may contain constituents above these levels, yet pose little threat to human health or the environment when properly recycled. Other initiatives, such as the one described in this report, will address these materials.

EPA has not listed as hazardous all secondary materials that are a threat to human health or the environment. If a solid waste is not listed, it may be hazardous because it exhibits a characteristic of hazardous waste. To date EPA has promulgated four characteristics, with wastes exhibiting these characteristics known as "D wastes":

Ignitability (D001 - 40 C.F.R. § 261.21) — A solid waste is a hazardous waste "exhibiting the characteristic" of ignitability if its flash point is less than 140 F.

Corrosivity (D002 - 40 C.F.R. § 261.22) — A solid waste is corrosive if its pH is less than or equal to 2 or greater than or equal to 12.5.

Reactivity (D003 - 40 C.F.R. § 261.23) — Generally, a solid waste is reactive if it is explosive or reacts violently with water.

Toxicity (D004 through D043 - 40 C.F.R. § 261.24) — A solid waste exhibits the toxicity characteristic ("TC") if, using the Toxicity Characteristic Leaching Procedure (TCLP), it contains one or more of the identified constituents at a level equal to or greater than the regulatory level.

The RCRA regulations exempt certain **solid wastes** from the definition of **hazardous waste** in 40 C.F.R. § 261.4(b). This means that EPA retains RCRA jurisdiction over these materials, but does not define or regulate them as hazardous wastes. Examples are: certain statutorily-exempt special wastes, known as "Bevill wastes", (wastes from the combustion of coal or other fossil fuels, mining wastes, and cement kiln dust); certain chromium wastes from the leather tanning industry; and chlorofluorocarbon refrigerants (CFCs) that are reclaimed.

JURISDICTION OVER HAZARDOUS WASTE HANDLERS

EPA regulates almost everyone who handles hazardous waste — generators, transporters, and treatment, storage, or disposal facilities. The requirements that apply to each are found in 40 C.F.R. Parts 262 through 265. A more detailed discussion of these requirements may be found in Chapter 5.

A **generator** is the person who first creates a hazardous waste or who first makes a waste subject to Subtitle C requirements. Any person who generates a solid waste must determine if that waste is a hazardous waste. If the waste is not excluded or listed, a generator may determine whether it is characteristic by either (1) testing or (2) applying knowledge of the characteristic in light of the materials or the generating process.

³40 C.F.R. § 261.3(a)(2)(iv).

Generators are subject to varying requirements depending on the volume of hazardous waste they generate within a calendar month. The volumes are not averaged. Exceeding the prescribed amount subjects the generator to a class with more stringent requirements.

Large Quantity Generator (LQG) — a person who generates more than 1000 kilograms of hazardous waste in any calendar month. LQGs must comply with full generator requirements, such as obtaining an EPA ID number, recordkeeping, and manifesting. The volume they generate is not limited, but they may only accumulate the waste for 90 days without being required to obtain a RCRA permit.

Small Quantity Generator (SQG) — a person who generates more than 100 kilograms but less than 1000 kilograms of hazardous waste each month. A SQG may not accumulate more than 6000 kilograms at any one time. SQGs are generally subject to the same requirements as LQGs, but they may accumulate waste for 180 days.

Conditionally Exempt Small Quantity Generator (CESQG) — a person who generates less than 100 kilograms of hazardous waste each month. CESQGs are exempt from most RCRA Subtitle C requirements.

RCRA fully regulates **treatment, storage, and disposal facilities (TSDFs)**. Every TSDF must have a permit, although facilities that were managing hazardous waste before 1980 can obtain "interim status." Interim status facilities may continue operating under specified conditions and requirements until a final permitting decision is made. Ultimately, all interim status facilities must obtain a permit or close. Because Congress was so concerned about contamination from hazardous waste disposal, it added a requirement for "corrective action" in the HSWA amendments. RCRA now requires that any permit issued to a TSDF after November 8, 1984, must address corrective action for releases of hazardous wastes or hazardous constituents from any solid waste management unit at the facility (42 U.S.C. § 6924(u)).

Facilities must manage hazardous waste under very rigorous and comprehensive requirements. Part 264 (for permitted facilities) and Part 265 (for interim status facilities) cover almost every aspect of hazardous waste management. The regulations include general facility standards, emergency preparedness, unit-specific design requirements, closure and financial responsibility. Details of these requirements are discussed in Chapter 5 of this report.

Other RCRA regulations exempt certain recycled **hazardous wastes** from many of the Subtitle C requirements, although EPA retains RCRA Subtitle C jurisdiction over these hazardous wastes. These materials are called "recyclable materials" and are subject to varying levels of control, depending on the material and how it is recycled. The hazardous wastes that are eligible for these alternate requirements are listed in 40 C.F.R. § 261.6. The specific requirements for each material appear in 40 C.F.R. Part 266. For example, recyclable materials applied to or placed on the land must comply with Subpart C of Part 266, and recycled lead-acid batteries must comply with the requirements of Subpart G of Part 266.

Subtitle C regulation of waste management is generally "all or nothing." Rarely do the regulations provide an intermediate level of control on materials or management activities, although the risks of different materials and processes can vary greatly. EPA has promulgated a few exceptions to that rule, most notably the requirements in 40 C.F.R. § 261.6 and Part 266 for recyclable materials. Some of these rules, especially the alternative requirements for recycling lead-acid batteries, involve detailed management conditions. A facility meeting these conditions

need not obtain a RCRA hazardous waste permit. Specific management requirements for recyclers and other hazardous waste handlers are discussed in more detail elsewhere in this report.

APPENDIX C

ROUNDTABLE PARTICIPANTS

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APPENDIX D

THE WORLD OF HAZARDOUS WASTE RECYCLING

Recycling operations vary depending on the industry performing the recycling. Recycling operations are usually tailored to specific plans to maximize production or minimize costs. Companies recycle either to recover a valuable material or to recover energy. Examples of material recovery include reclaiming precious metals from plating sludge or lead from spent lead-acid batteries. Energy recovery includes burning spent solvents in a boiler to produce steam and electricity.

Almost all recycling falls into four categories: secondary materials generated and recycled at a manufacturing facility; captive recycling; product stewardship; and commercial recycling.

On-Site Recycling

Most industrial hazardous waste is recycled at the generating facility.¹ On-site recycling includes many different types of activities. Some examples are described below:

A material is used to manufacture a product that, because of contamination or depletion, can no longer be used without further reprocessing. An example is using solvent to wash parts as they are manufactured, then distilling the dirty solvent to regenerate clean solvent for the manufacturing process.

A manufacturer produces an assembled part that does not meet the company's specifications when it is inspected during quality control. The part is disassembled, and some pieces are used directly in an earlier state of manufacture. Other parts must be processed before they can be used, such as thermal metal recovery.

A manufacturer forms a metal part by casting, rolling, extrusion, and/or sampling. As the parts leave the production line, excess metal is returned to the beginning of the process to be remelted and reused.

Electric arc furnace dust from primary zinc smelting is used as an ingredient to make fertilizer.

As explained in Chapter 2, some of these recycling processes are exempt from current RCRA regulation, while others are not. Generally, EPA views an operation as outside RCRA jurisdiction when it more closely resembles ordinary production or ordinary use of commercial products than waste management. Even processes that are otherwise exempt are generally regulated if the products are placed on the land, burned, or accumulated for long periods.

Captive Recycling and Product Stewardship

Many manufacturers find that they can reduce costs and increase profits with intracompany or "captive" recycling; i.e., generating secondary materials at one location, then recycling them at another facility owned by the same company. Sometimes one site generates an insufficient volume of a material to justify the capital investment in a recycling process. Consolidating the material from all locations enables the company to invest in one recycling

¹See page 4-3.

location. These recycling activities often resemble the examples given for on-site recycling above.

Increasingly, manufacturers wish to take back their products (or similar products from other manufacturers) for recycling as part of "product stewardship" programs. Examples include accepting used or off-specification products and rebuilding, reusing, or otherwise reprocessing them into the same or different products. For example, a manufacturer accepts spent thermal transfer fluids, which it originally produced, from heat exchangers to manufacture into new transfer fluids.

Commercial Recycling

It may be more economical for a manufacturer to send secondary materials to an unrelated plant for recycling. Typically, this "commercial" or "off-site" recycling facility relies on secondary materials, rather than virgin materials, for its production. However, some manufacturers using virgin materials are also commercial recyclers, such as lead-acid battery manufacturers who operate on-site secondary lead smelters. Sometimes the generator pays the commercial recycler to take its recyclable materials; sometimes the recycler pays the generator for its materials. Materials frequently recycled commercially include solvents, electric arc furnace dust from steel manufacturing, and nickel-cadmium and lead-acid batteries.

Hazardous Waste Recycling: A Statistical Summary

One of the Task Force's goals is to obtain better information about hazardous waste recycling in the United States. Neither EPA or the States currently gather complete data on recycling activities because many of the recyclers or practices are exempt from reporting requirements. We have attempted to gather and summarize data that are available, and we continue to solicit new information from the States and industry. Following is a summary of hazardous waste recycling activities conducted in 1989. Unless otherwise noted, the exhibits below are from the latest available national survey of hazardous waste handlers, the 1993 Biennial Report.² RCRA requires certain hazardous waste handlers to report on their activities every two years. The Biennial Report summarizes and analyzes data on hazardous waste generation and management activities obtained through the Biennial Reporting System.

In 1989, over 19,000 large quantity generators produced 197 million tons of hazardous waste managed under RCRA (See Exhibit 1). About one third of these generators recycle approximately 3 million tons of hazardous waste, or 1.5% of the total hazardous waste generated. While many generators recycled their waste, they did not



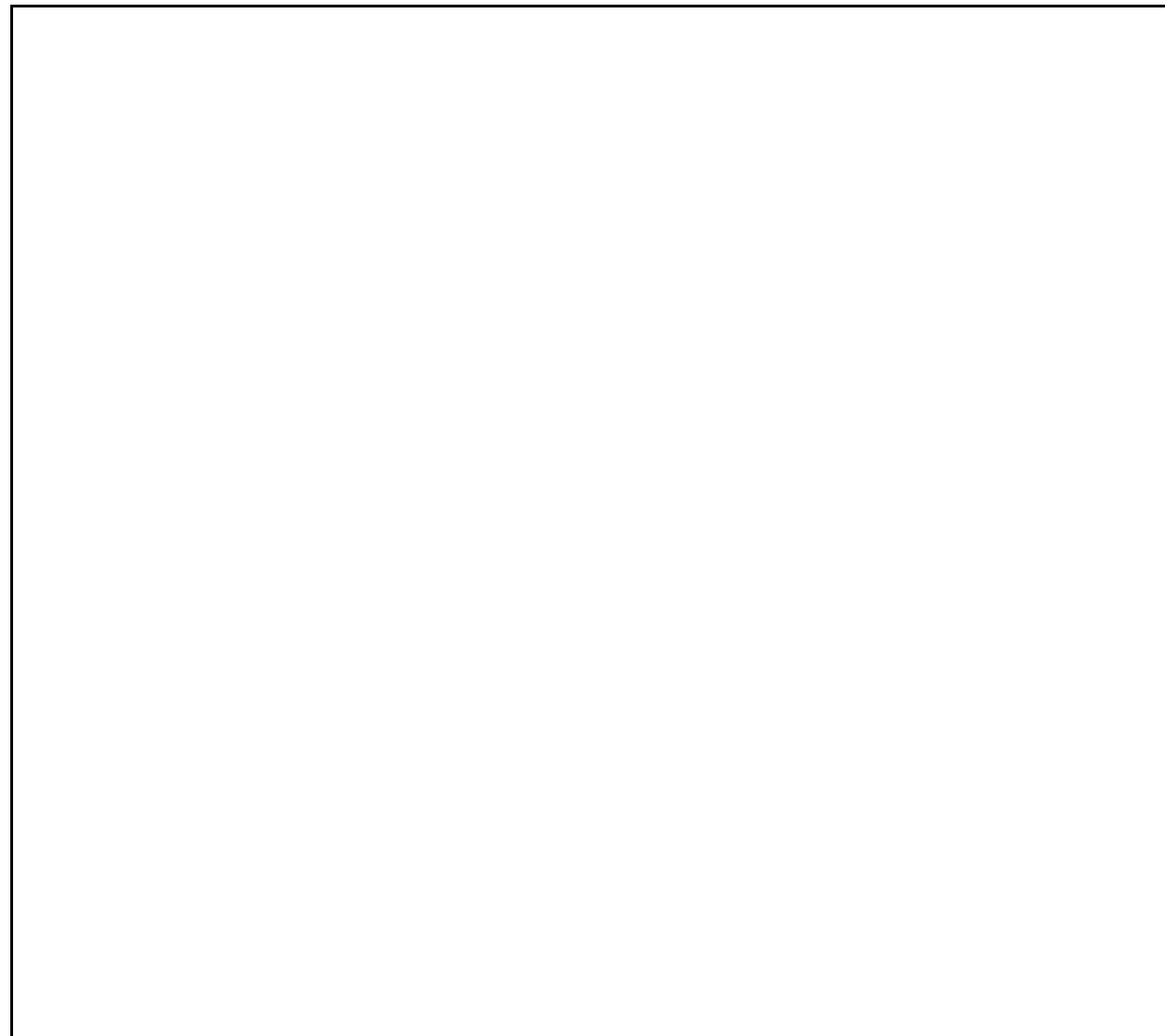
²U.S. EPA, *National Biennial RCRA Hazardous Waste Report* (Based on 1989 Data) (February 1993).

recycle very much of the total waste generated. One explanation may be that as much as 95% of hazardous waste is generated as wastewater, which is not easily recycled. Another reason may be that a significant portion of hazardous waste recycling is not reported.³

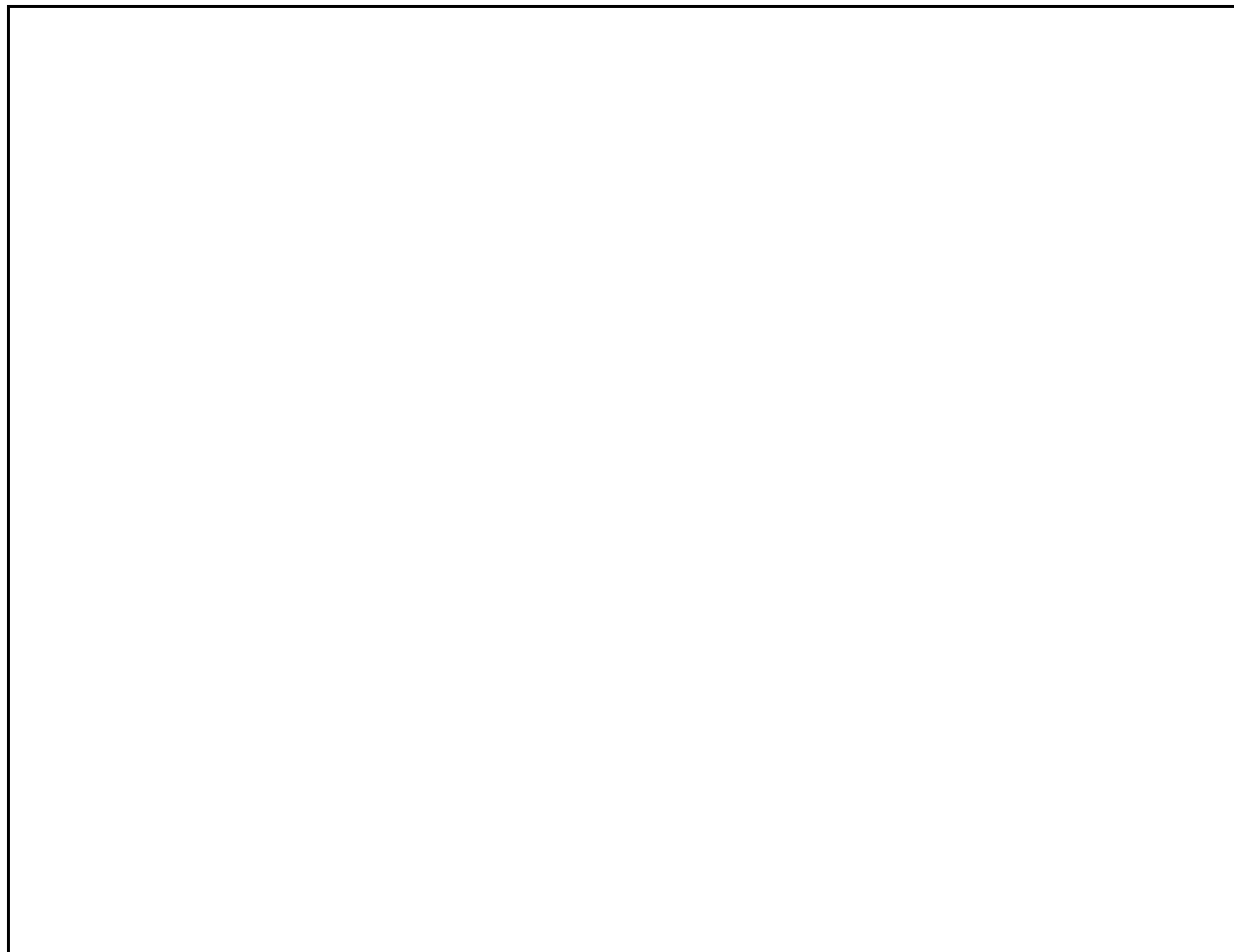
These factors may also account for discrepancies in our information about on-site recycling. The Biennial Report shows that 43% of the recycling in 1989 occurred on-site. Since much of the recycling occurring on-site is exempt from regulation, on-site recycling is less likely to be included in our data. Considering CMA's data that 5 million tons of hazardous waste were generated in the chemical industry alone, we assume that the amount of recycling performed on-site accounts for much more than 43% of the total.

Interestingly, sixty-three percent (63%) of all first-time recycling occurred off-site. Many factors influence a company's decision whether to recycle and, if so, whether to keep the material or send it off-site. When asked whether any factors delayed or prevented a company from recycling, two-thirds of the respondents reported specific limiting factors. As seen in Exhibit 2, a generator's decision to recycle off-site is influenced by factors such as economic feasibility, the generator's technical expertise, availability of a market, and permitting burdens.

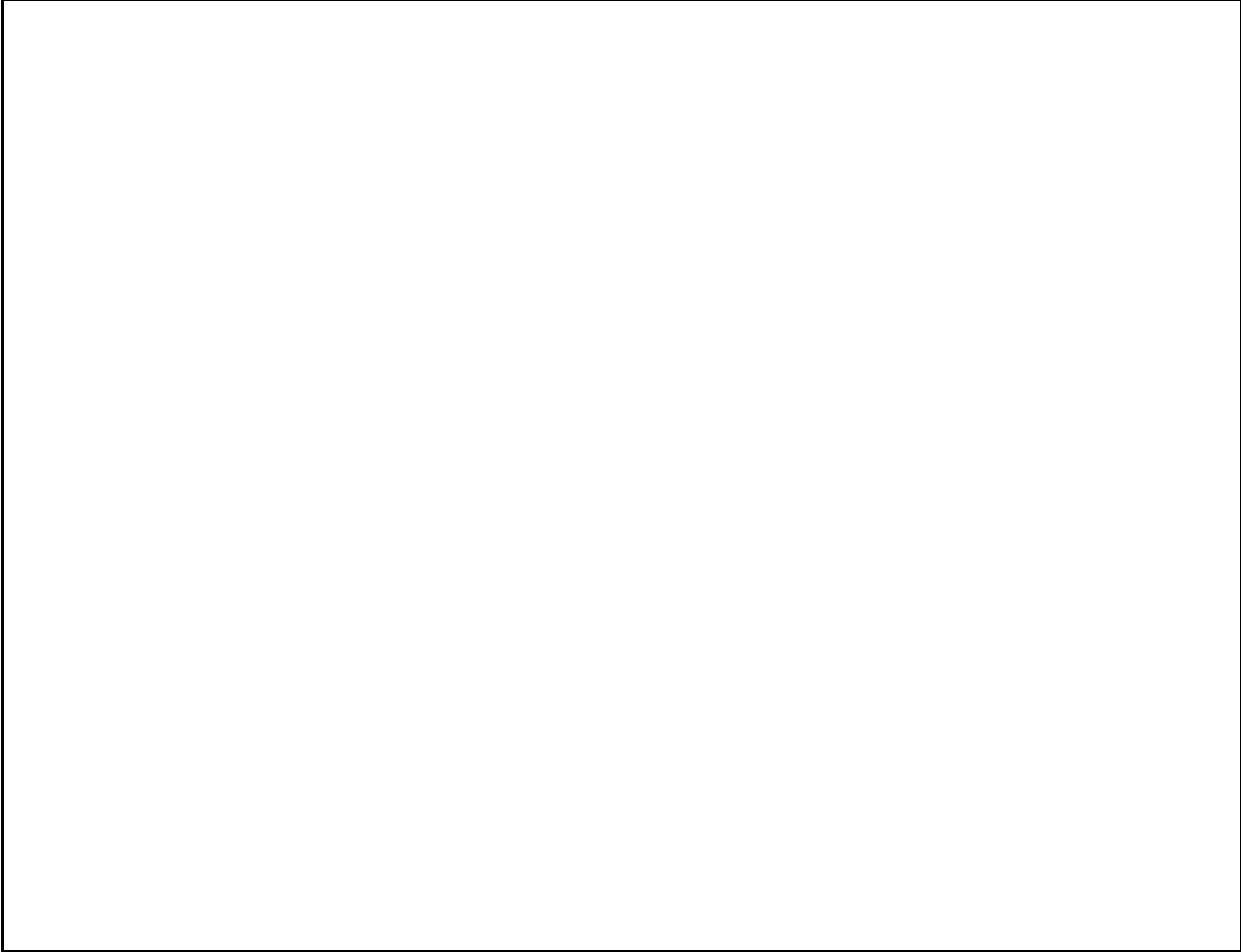
³For example, the Chemical Manufacturers Association conducted a survey in 1977 of 582 plants which revealed that approximately 5 million tons of hazardous waste was recycle. This substantially exceeds the 2.8 million tons reported in the 1989 Biennial Report from approximately 20,000 generators.



As shown in Exhibit 3, facilities generating less than one percent (1%) of the nation's total hazardous waste recycle most of their own waste, while 93% of the facilities reporting each generate less than 1,000 tons per year. Totaled, this amounts to less than one percent (1%) of the total amount of hazardous waste generated. However, ninety percent (90%) of all recyclers are in this group. They recycled approximately fourteen percent (14%) of all reported recycled hazardous waste, or approximately twenty percent (20%) of the hazardous waste they generate. The great majority of the total waste generated, ninety-nine percent (99%), was generated by 1,290 generators, or 7% of total generators. However, they recycled only 2.4 million tons, or one and two-tenths percent (1.2%), of the 196 million tons they generated.



Almost all of the waste recycled comes from the one hundred (100) largest recyclers (See Exhibit 4). Over ninety percent (90%) of the metals recovery, energy recovery, and other forms of recovery is accomplished by these one hundred firms. Solvents, on the other hand, are recovered by more recyclers — the top 100 firms perform only sixty-one percent (61%) of the solvent recovery.



Recycling is also the predominant method of management for many waste streams. For instance, over ninety percent (90%) of the K024, U155, K030, P085, K023, U141, U201, U191, U173, U124 and U059 waste streams were recycle in 1989. Similarly, twenty-five waste streams were recycled at the rate of fifty percent (50%) or more,⁴ while twenty-three wastes streams were recycled at the rate of ten (10%) to fifty percent (50%).

Thirteen waste streams also had 50,000 tons or more recycled. These included: ignitable wastes (D001), spent solvents (F001, F002, F003, and F004), chromium wastes (D007), electric arc furnace dust from steel production (K061), corrosive wastes (D002), spent pickle liquor from steel production (K062), lead wastes (D008), wastewater treatment sludges from electroplating (F006), heavy distillation ends from ethylene dichloride production (K019), and wastewater treatment skimmings from petroleum refining (K048).

⁴Thirteen of these wastes, K087, U161, U123, U196, K019, U210, U211, K024, K030, U201, U191, U173, and U214 were recycle in quantities exceeding one thousand (1,000) tons.

Recycling — By Industry

The industrial organic chemicals industry (SIC 2869) recycled the most waste in 1989 (over 732,787 tons) followed by blast furnaces and steel mills (SIC 3312) at 226,860 tons, the business service industry (SIC 7389) at 173,459 tons, and the industrial gases industry (SIC 2813) at 165,094 tons.

Most industrial sectors reported generators who recycled, some in large numbers. Recyclers were found in quite diverse industries — iron ore mining and stenographic services, transportation-related facilities, optical instruments and lens manufacturers, footwear manufacturers and electronics manufacturers.

Recycling — By Category

Exhibit 5 summarizes the amount of hazardous waste recycled through metals recovery, solvent recovery, energy recovery and other recovery. Most hazardous waste recycled (60%) is through metals recovery and energy recovery. However, the majority of recycling facilities (64%) are solvent recyclers. They represent 64% of all hazardous waste recyclers, but only 16% of hazardous waste recycled.

Metals Recovery

Metals recovery represents 35% of the total amount of hazardous waste recycled in 1989. This amount was recycled by 1,065 generators, or 15% of the total number of generators recycling their hazardous waste. Many involved recycling of the following wastes:

- Electroplating wastes (F006, F007, F009)
- Ignitable, corrosive, and reactive wastes (D001, D002), D003)
- Wastes characteristically toxic for metals (D006, D007, D008, D009)
- Iron and steel wastes (K061, K062)

Ten wastestreams were recycled using metals recovery by more than ten percent (10%) of the facilities that generate them: P094, D011, F009, F006, U151, U177, F007, K069, K061, and U155.

Energy Recovery

Of the hazardous waste recycled, thirty-four percent (34%) is through energy recovery (1,308 facilities or eighteen percent (18%) of the recyclers). However, considerably more hazardous wastestreams are involved in energy recovery than metals recovery — 3,059 facilities or sixty-four percent (64%) more than metals recovery. Five wastestreams accounted for over fifty percent (50%) of the total amount of hazardous waste recycled through energy recovery. These were: F001, F002, F003, F005, and D001.

Solvent Recovery

Although only sixteen percent (16%) of hazardous waste recycled is through solvent recovery solvent recyclers constitute the majority of facilities (sixty-four percent (64%)) who recycle. Similarly, many more wastestreams (86,830 can potentially be recycled through solvent recovery than any other type of recycling. Wastestreams recycled through solvent recovery include F001, P011, U328, P014, D001, U359, P023, U080, U213, P018, and U227. Among these wastes, 1,728 generators use F001 and 2,317 generators use D001 for solvent recovery. Similarly, ten wastestreams were recycled using solvents recovery by more than ten percent (10%) of the facilities that generate them. These were: U112, P069, U226, F001-F005, D001, and K027.

Other Forms of Recovery

This category includes such operations as acid regeneration, waste oil recovery and nonsolvent organics recovery. Approximately 423,513 tons of waste from this category were recycled by 1,882 generators. Over 4,800 waste streams were involved in this recycling. Over twenty-five percent (25%) of the total amount recycled was accounted for by twelve waste streams. These included F001, F002, F003, F005, D001, D002, D008, K022, K019, K048, K061, and K062. On average, 7.7 percent of the generators of these wastes (or 4.1 percent of the total amount of waste generated) recycled their waste.

Conclusions

Although we lack current, detailed data on recycling quantities and practices, we can draw some preliminary conclusions from the information available. We believe that our suggested system can positively affect many of the factors that generators say discourage or limit their recycling. By encouraging on-site recycling and making it easier to accumulate materials to recycle, we believe that smaller generators will be more likely to reuse their materials. By eliminating many costly impediments such as facility-wide corrective action and financial assurance, our proposed system should also make recycling more attractive to larger generators.