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PREFACE

Spurred on in the late 1980s by fears of an impending "landfill crisis," state legislators found a ready remedy in recycling laws. Prompted by these new state laws, local governments put in place over 7,000 curbside recycling programs that began collecting tons of bottles, cans, jars, newspapers, and whatnot. In short order, the legislative refrain moved from "Recycle now" to "We need markets." Legislators moved to calibrate recycling supply and demand with a host of proposed regulations— recycled content mandates, manufacturer "take-back" requirements, government procurement preferences, and various subsidies. Whatever the reason, deregulation as a way to expand recycling markets was virtually ignored.

This is unfortunate. Shorn of all its ideological trappings, recycling is essentially a process of innovation. Like electricity, cars, and computers, new recycling technologies must overcome a lot of institutionalized barriers to change. Many obvious regulatory barriers have been removed, but many still remain. Sometimes, these barriers are subtly hidden, disguised as unnecessary procurement standards or superfluous safety regulations. Sometimes, they're unintended side effects of unrelated legislation. But regulatory barriers do exist, and their elimination or modification ought to be the starting place for trying to enhance recycling markets.

It's time for a change of paradigm. For years, environmental policy has been run on a philosophy of "environment good, industry bad." But this philosophy can't adequately deal with the reality of recycling— which blends environment with industry.

This policy series, "Recycling and Deregulation: Opportunities for Market Development," will cover the following areas:

- The use of recycled materials in food packaging, and why FDA regulations and other laws, originally enacted to protect the public health, can inhibit recycling;

- The recycling of hazardous wastes, and why some hazardous waste regulations, instead of protecting the environment, discourage the safe reuse of hazardous products, like lead batteries and used oil;

- The transport of solid waste, and developments to watch out for that could limit the supply of recyclables by discouraging their transportation;

- The scrap tire management problem, and how some state efforts to prevent tires piling up in garbage dumps are counterproductive;

- Recycled building materials, and how building codes unnecessarily prohibit their use;

- How industry standards groups, which governments rely on in their procurement practices, can discourage the use of recycled materials in products like plastic lumber and drainage pipes; and,

- How government procurement agencies and miscellaneous other government bureaus, through superfluous regulation, stifle the development of innovative recycling technologies.

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RECYCLING HAZARDOUS WASTE:
HOW RCRA HAS RECYCLERS RUNNING AROUND IN CERCLAS

by
Alexander Volokh

EXECUTIVE SUMMARY

Each year, about 100,000 to 1 million tons of hazardous waste are recycled in the United States. Another 13 million tons are dumped into hazardous waste landfills. The amount recycled is only about 0.8 percent to 7.7 percent of the amount dumped.

The two main federal laws regulating hazardous waste—the Resource Conservation and Recovery Act (RCRA) and Superfund—may be reauthorized in the 104th Congress. This makes hazardous waste a hot topic in the environmental world. Recycling is also high on many people's environmental checklists. But the two issues—hazardous waste and recycling—are rarely thought of together.

Still less frequently is hazardous waste recycling thought of favorably. Hazardous waste recycling's bad reputation stems from a number of environmental misconceptions. When thinking about hazardous waste recycling, one must keep in mind that:

- Calling something hazardous doesn't make it so.
- Calling something a waste doesn't make it bad.
- A hazardous ingredient needn't produce an unsafe product.

We don't want *too much* recycling of hazardous waste—not if it wastes more resources than it saves. But we don't want to artificially discourage it either by needlessly making recycling more expensive than landfilling. Yet the federal government is doing exactly that—even while it's trying to encourage recycling in general, it's discouraging the recycling of hazardous waste.

- *Hazardous waste law is confusing.* The terms “solid waste” and “hazardous waste” are difficult to understand. This is a big problem when a regulatory scheme hinges on the definitions, and it has led to uncertainty and litigation.

- *The EPA's risk assessment is unnecessarily conservative*. The impact of improper disposal is small compared to other risks that the public willingly accepts. The risks posed by hazardous waste are also lower than most of the risks currently addressed by environmental regulation.

- *RCRA's requirements are expensive*. The total cost of complying with RCRA is estimated at over $40 billion.

- *Recycling is treated differently than the manufacture of the same products out of virgin materials.* RCRA often considers that substances intended for recycling are in fact "discarded." Many perfectly acceptable and reusable (and regulated) raw materials become RCRA hazardous wastes the moment they are "discarded," whatever that means, which virtually guarantees that few people will recycle them.

In short, hazardous waste law is expensive, irrational, and confusing. The only way to get around these requirements for certain products is by case-by-case exemptions. Lead acid batteries are exempted from hazardous waste law until they reach the recycler, so battery recycling is high despite the industry's costly regulation. RCRA regulation has discouraged the recycling of spent aluminum potliner, which is only now slowly starting up again. And state hazardous waste provisions in California and some New England states have discouraged the recycling of used motor oil.

Other aspects of hazardous waste law also do their part to discourage recycling. The Toxics Release Inventory (TRI), for instance, requires that companies report how much of certain "toxic chemicals" they use. There have been proposals to expand the list of industries subject to the TRI to include scrap metal recyclers and waste management facilities. This sounds like a good idea, but in fact it would discourage the recycling of copper, zinc, and other metals. These metals are hazardous in certain forms (for instance, when they're dissolved and discharged into water), but not when they're recycled; making scrap metal recyclers subject to the TRI would give people the impression that scrap recyclers are heavy polluters because of the amounts of metals they accept. Also, waste management facilities only receive wastes from elsewhere, and making them subject to the TRI would impose costly bookkeeping burdens on them without adding to health or safety.

And then there's Superfund, which provides for the cleanup of hazardous sites. If a hazardous substance is found at a Superfund site, whoever arranged for the treatment or disposal of the substance at that site can potentially be made to pay for the cleanup of the *entire* site. The problem here is that selling metal to a scrap metal recycler can be considered "arranging for disposal" if that recycler eventually goes bankrupt and his property becomes a Superfund site—and so everyone who ever sold anything to the scrap metal recycler can be stuck with huge cleanup costs for "contamination" they weren't even responsible for. This discourages the recycling of scrap metal and other products, like nickel-cadmium batteries, containing substances that are considered hazardous.

Superfund should be amended so that recycling isn't considered "treatment or disposal." RCRA should be overhauled so that it is based *solely on realistic risks of actual harms*. Whether or not something is a waste is irrelevant to the risk it poses. At the very least, RCRA should be amended to exclude recyclable materials.

"Our wasted oil unprofitably burns,
Like hidden lamps in old sepulchral urns."

—William Cowper, *Conversation*

"This third, dull lead, with warning all as blunt,
`Who chooseth me must give and hazard all he hath'....
I'll then not give nor hazard aught for lead."

—William Shakespeare, *The Merchant of Venice*

I. HAZARDOUS WASTE RECYCLING: WHO NEEDS IT?[1]

Each year, about 100,000 to 1 million tons of hazardous waste are recycled in the United States. Another 13 million tons are dumped into hazardous waste landfills.[2] The amount recycled is only about 0.8 percent to 7.7 percent of the amount dumped, and this is unfortunate.

The two main federal laws regulating hazardous waste—the Resource Conservation and Recovery Act (RCRA)[3] and Superfund[4]—may be reauthorized in the 104th Congress. This makes hazardous waste a hot topic in the environmental world. Recycling is also high on many people's environmental checklists. But the two issues—hazardous waste and recycling—are rarely thought of together.

Still less frequently is hazardous waste recycling thought of favorably. Hazardous waste recycling's bad reputation stems from a number of environmental misconceptions. Here are a few facts to keep in mind when thinking about hazardous waste recycling:

- *Calling something hazardous doesn't make it so.* The Environmental Protection Agency regulates many substances without any solid evidence that they threaten anyone in any way. The health and environmental effects of "hazardous" wastes are poorly understood, and political forces have shaped RCRA regulations at least as much as scientific knowledge.

- *Calling something a waste doesn't make it bad.* There's nothing special about wastes that makes them more troublesome than regular "virgin" raw materials. Industry uses dangerous raw materials, and produces safe wastes, all the time. The only thing that's important about a substance is its chemical composition—not its place in the industrial pecking order.

- *A hazardous ingredient needn't produce an unsafe product.* Recycled lead is managed as a hazardous waste, and yet we use recycled lead acid batteries routinely. Of course, recycled lead acid batteries come with some risk attached, and so does recycled motor oil. But then again, so do regular lead acid batteries and virgin motor oil. There's no particular reason to expect products made from hazardous wastes to be more dangerous than the same products made from scratch.

Is hazardous waste recycling a good idea? Well, sometimes it is, and sometimes it isn't. We certainly don't want *too much* recycling of hazardous waste—not if it wastes more resources than it saves. But we don't want to artificially discourage it either by making recycling more expensive than landfilling. Yet the federal government is doing exactly that—even while it's trying to encourage recycling in general, it's discouraging the recycling of hazardous waste. Hazardous waste law is expensive, irrational, and confusing, and the sad part of it is that RCRA and Superfund were originally enacted to *help* the environment.

Why should we care about hazardous waste recycling? Compared to the total volume of solid waste in the United States, 13 million tons may not seem like a lot. But it does seem like a lot to the companies and industries involved. In many cases, hazardous waste recycling is an economically viable industry, and we should scrutinize regulations that penalize that industry just as we do regulations that penalize any other industry. And, regardless of the numbers, there is something unwholesome about a public policy that is keen on reducing the volume of nonhazardous solid waste, but which sits idly by while hazardous waste, instead of being transformed into safe, usable products, needlessly piles up in hazardous waste landfills because every other option is too expensive given current regulations.

This paper gives an overview of the provisions of RCRA that deal with recycling. It then presents three examples of materials that are, or have been, considered hazardous wastes—lead, aluminum potliner, and used oil. The paper rounds out the picture by adding the effect of Superfund on hazardous waste recycling, and concludes with suggestions for reform.

II. RCRA

A. Really Complicated Regulatory Apparatus: Relinquishing Clarity and Retaining Ambiguity

RCRA is divided into several parts; "Subtitle C" deals with hazardous wastes, while "Subtitle D" deals with nonhazardous wastes. Under RCRA, a hazardous waste is[5] any solid waste[6] that:

- exhibits a hazardous "characteristic," like ignitability or toxicity—for example, corrosive acids, sodium hydroxide, or chlorine bleaches; or
- has been specially "listed" as hazardous by the Environmental Protection Agency (EPA).

The EPA lists three different kinds of hazardous waste:

- nonspecific source wastes—generic wastes that are commonly produced, like spent halogenated solvents;[7]
- specific source wastes—wastes from certain processes, like wood preserving wastes, spent catalysts, or aluminum potliner;[8] and
- commercial chemical products—like chloroform, creosote, and sulfuric acid.[9]

That's the simple part. When Congress enacted RCRA, it was vague on the notion of "solid waste," and referred to "garbage," "refuse," and "other discarded material" without defining the terms.[10] The task of defining and refining terms was left to the EPA. By EPA's admission, the resulting regulations are "complicated"[11] and "convolu-ted."[12] For instance, even though hazardous waste is a type of solid waste, EPA regulations also define solid waste as a subset of hazardous waste.[13] The regulations are so confusing that up to a third of the inquiries on the EPA's RCRA Hotline involve the definitions of "solid" and "hazardous" waste.[14] In 1989, the number of calls was over 1,000,[15] and a more recent estimate has the number of calls at 130,000 a year.[16] "After reading and rereading the regulations several times," a federal district judge concluded that "the regulations are in fact dense, turgid, and a bit circuitous."[17] Don R. Clay, EPA Assistant Administrator for the EPA Office of Solid Waste and Emergency Response, has called RCRA "a regulatory cuckoo land of definition," in which a substance that "wasn't hazardous yesterday... is hazardous tomorrow, because we've changed the rules."[18] The EPA repeatedly resorts to flowcharts to make its regulations understandable (see Figures 1-4[19]).

Figure 1
Definition of a Solid Waste

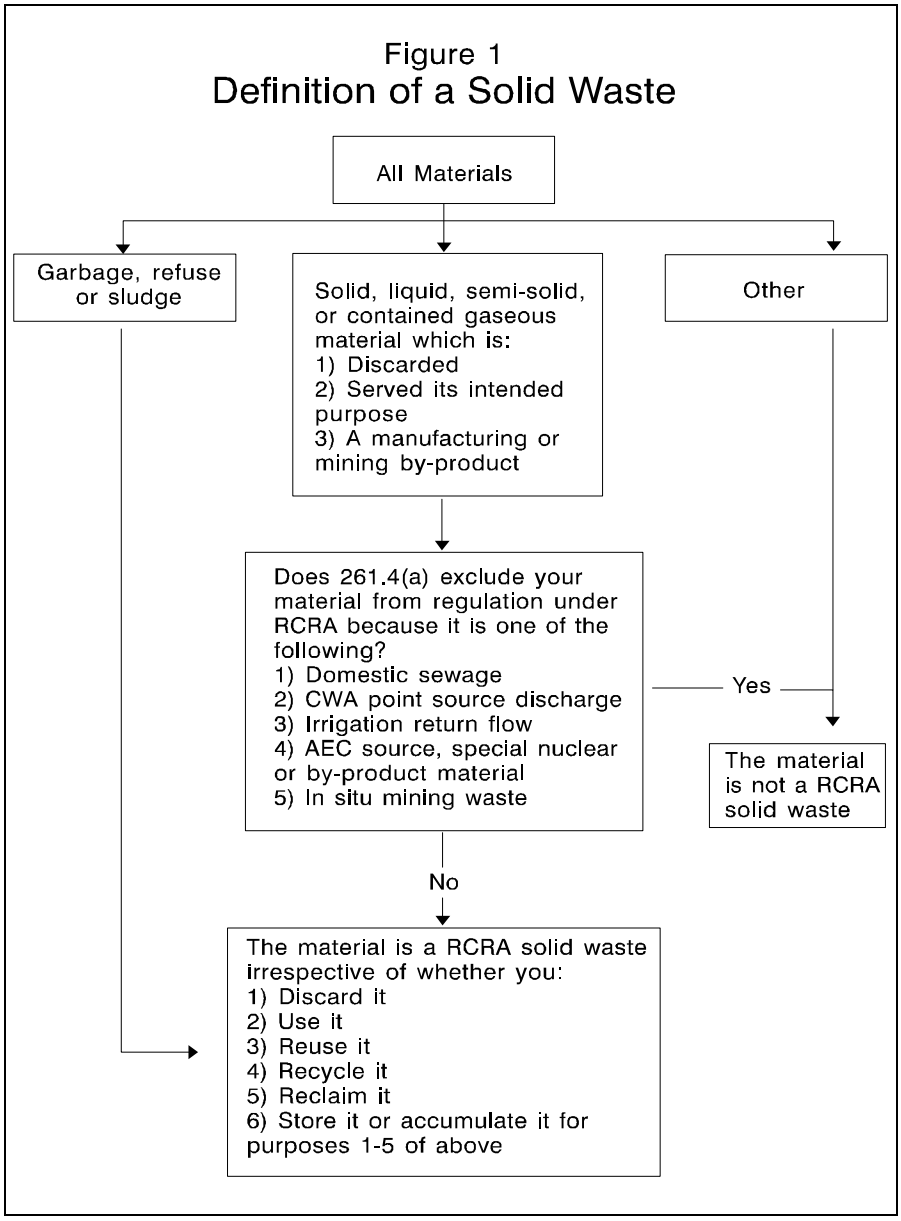
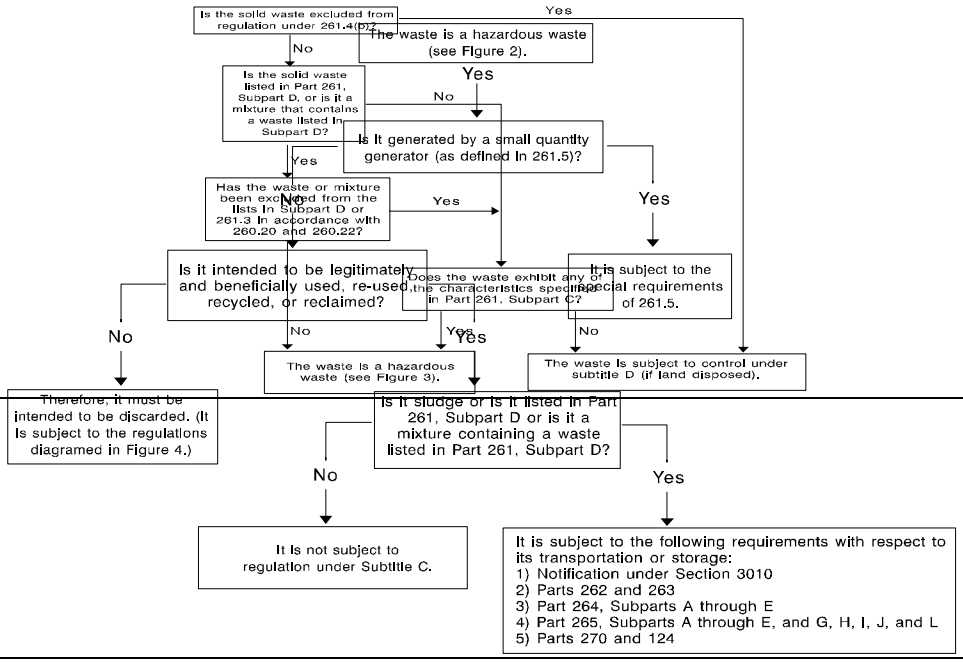


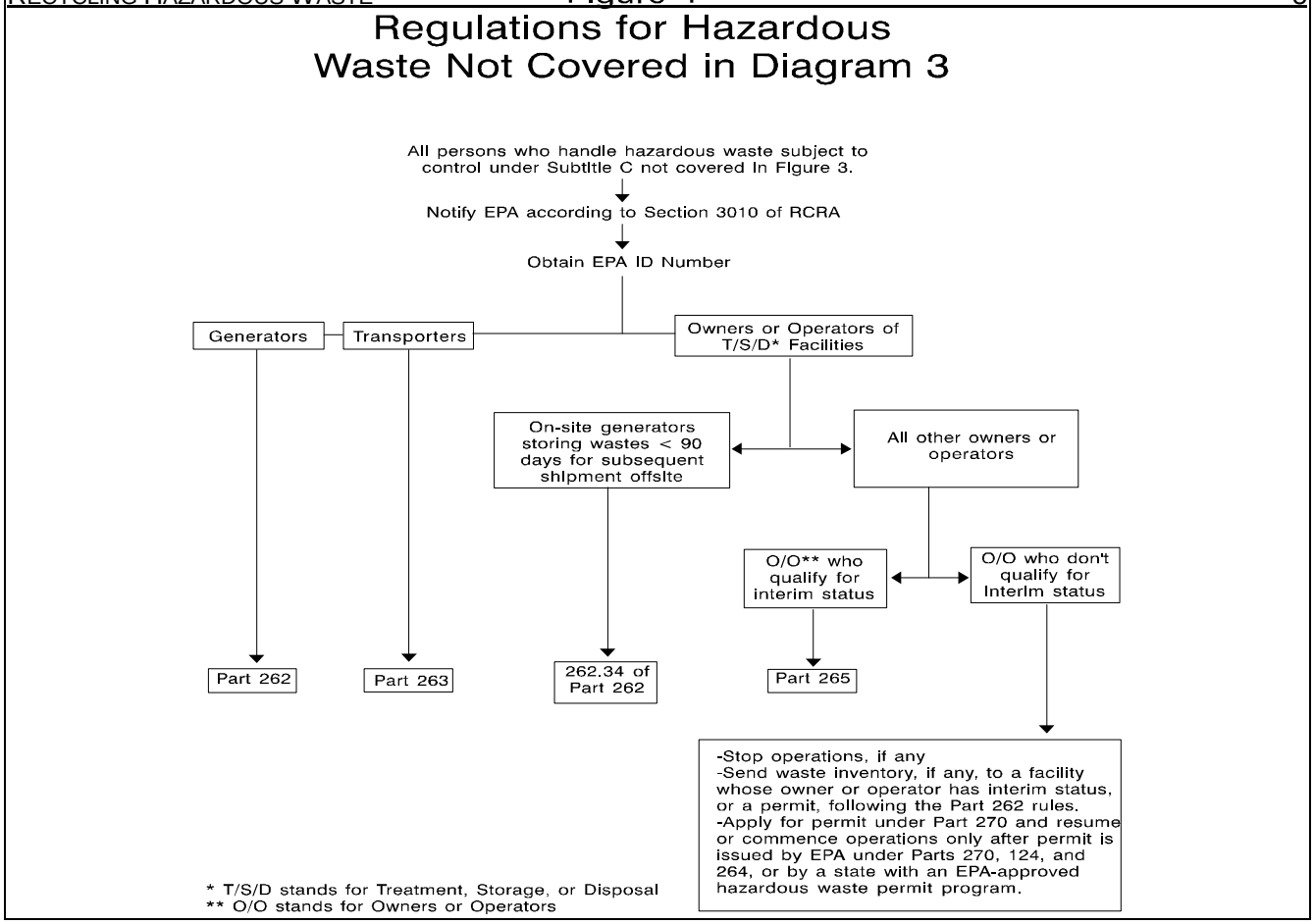
Figure 3 Figure 2
Definition of a Hazardous Waste
Special Provisions for Certain Hazardous Waste



This isn't just a question of semantics; when an entire regulatory scheme applies to some people and not to others, figuring out who's who becomes vitally important. This is, indeed, part of the problem with RCRA—the existing regulations are an “all or nothing” proposition. A recycler is either in or out of RCRA Subtitle C regulation, depending on whether he can be excluded or exempted from the definition of “hazardous solid waste.”[20]

The uncertainty about what is and what isn't a hazardous waste has led to a lot of litigation. Two parts of RCRA have been especially troublesome—the “derived from” rule,[21] by which anything derived from a listed hazardous waste is a hazardous waste, and the “mixture” rule,[22] by which anything mixed with a listed hazardous waste is a hazardous waste.[23] In 1991, a federal appeals court ruled that EPA had violated the notice and comment rules of the Administrative Procedure Act when it issued the rules in 1980. The court voided the “derived from” and “mixture” rules. But the EPA reissued the rules in slightly modified form in March 1992 and said it would revise them. Because of the EPA's delay, Congress set a deadline of October 1994 to revise the rules, which the EPA missed. The Environmental Technology Council, the Edison Electric Institute, and the Chemical Manufacturers Association filed lawsuits against the EPA, asking the court to set a new deadline. In November 1994, the EPA agreed to issue a proposed rule by August 15, 1995, and a final rule by December 15, 1996.[24] The EPA's consent decree was approved by a federal judge in May 1995.[25] (The August 15 date was later delayed 90 days.[26]) Meanwhile, the “derived-from” and “mixture” rules are still in effect.[27]

Figure 4



B. Ridiculously Conservative Risk Assessment: Remote Chances Regulated Anyway

The regulations are confusing, in part because of the uncertainty about the effects of most hazardous wastes.[28] Many experts believe that the impact of improper disposal is small compared to other risks that the public willingly accepts.[29] The risks posed by hazardous waste are also lower than most of the risks that are currently addressed by environmental regulation.[30] The risks of hazardous waste are involuntary, and so the public is more eager to control them than it is to control voluntary risks. This is as it should be; involuntary risks raise the issue of coercion and ought to be held to a more stringent standard. But in the case of RCRA, the actual magnitudes of the risks involved are uncertain and, in many cases, purely theoretical. While "potential" risks may be substantial, we know little about the *actual* risks of past and current disposal practices.[31] There are few published scientific reports of health effects clearly attributable to chemicals from disposal sites.[32] For certain substances that are considered "hazardous wastes," the best estimate for the number of people who die each year from exposure may be zero.[33]

EPA risk assessment uses unrealistically conservative assumptions about risk. The traditional risk assessment methods that EPA uses are seriously flawed because they allow and encourage conservatism at the point of risk *assessment* instead of at the point of *managing* risks that have been assessed accurately.[34]

In individual cases, when certain hazardous wastes pose insignificant risks, they can be exempted from the regulations by petition, but this rarely happens. According to the agency, "EPA's system for `delisting' (i.e., designating certain listed hazardous wastes as nonhazardous) is slow, onerous, ineffective, and at times controversial."[35] And the National Advisory Council for Environmental Policy and Technology, a public advisory committee to the EPA, charges that the delisting process is a deterrent to innovation. A delisting application, which can only be submitted after a process has been developed, tested, and demonstrated, "takes one to two years, costs a lot, and has an unpredictable outcome."[36]

C. Restrictive and Costly Requirements Abound

Hazardous wastes are subject to a complex and potentially costly set of regulatory requirements; the cost of complying with the hazardous waste provisions of RCRA is estimated in the billions of dollars,[37] and the total cost of RCRA is estimated at over $40 billion.[38] Certain individual regulations can cost billions of dollars per life saved.[39] Here are some of the requirements for the different actors in the hazardous waste story:

- Generators of hazardous waste have certain obligations, including proper storage, record keeping, and reporting. If the generator disposes of the wastes off-site, it also has to prepare a "manifest," a document that describes the waste and accompanies it during transportation. If the generator disposes of the wastes on-site, it is subject to the requirements applicable to a disposal facility.

- Transporters are subject to labeling and reporting requirements. They have to take the waste to an approved disposal site and make sure the manifest accompanies the shipment.

- Treatment, storage, or disposal facilities (TSDFs) are subject to a federally defined permit program. TSDF permit requirements are the most difficult and costly part of recycling hazardous wastes (see Table 1 and Figures 5–6[40]); the EPA reports that permits take an average of two to three years to process.[41] The appeal process is similarly long. Costs associated with RCRA compliance have been estimated at $100,000 to $200,000 per facility.[42] The important requirements for such facilities are financial responsibility requirements, preparedness planning, and reporting and recordkeeping obligations.[43]

Table 1: Several Factors Delay the Authorization Process

Regulation, Guidance, Training
- Lack of final regulations (e.g., Subpart S)
- Partial rulemaking (e.g., land ban)
- Cluster concept
- Lack of clear guidance
- Lack of understanding/ training
- Disconnect between state regulatory modification & authorization process

Standards for Review/Approval
- Vary at different layers
- Equivalent=identical
- Unclear consistency standard
- Processes, procedures must be identical
- Capability standard unclear
- Performance standard is perfection
- Unrealistic expectations
- Refusal to acknowledge resource limitations

Problems with the Process
- Poor communications
- Multiple layers of review
- Reopening of old issues
- Incomplete applications submitted
- Nitpicking
- Second guessing—new opinions
- Problems with Attorney General
- Lack of role definition
- Lack of accountability
- Too much paperwork
- Lack of understanding/training

Resources, Staffing
- Lack of staff dedicated to authorization
- Turnover
- Use of contractors
- Resources don't keep up with the program (capability)

Priority, Attitude
- Lack of EPA priority and commitment
- Feds don't want to give up control
- "We're cool and you're not"
- Zero risk = Environmental risk is high so ensure program is as close as possible (identical)

Other
- Political decision making and priority setting at headquarters and regions
- Overall complexity of program
- Slow response from states
- Legal precedence causing a problem
- Political interference

Figure 5
RCRA Permitting Process is Very Comprehensive

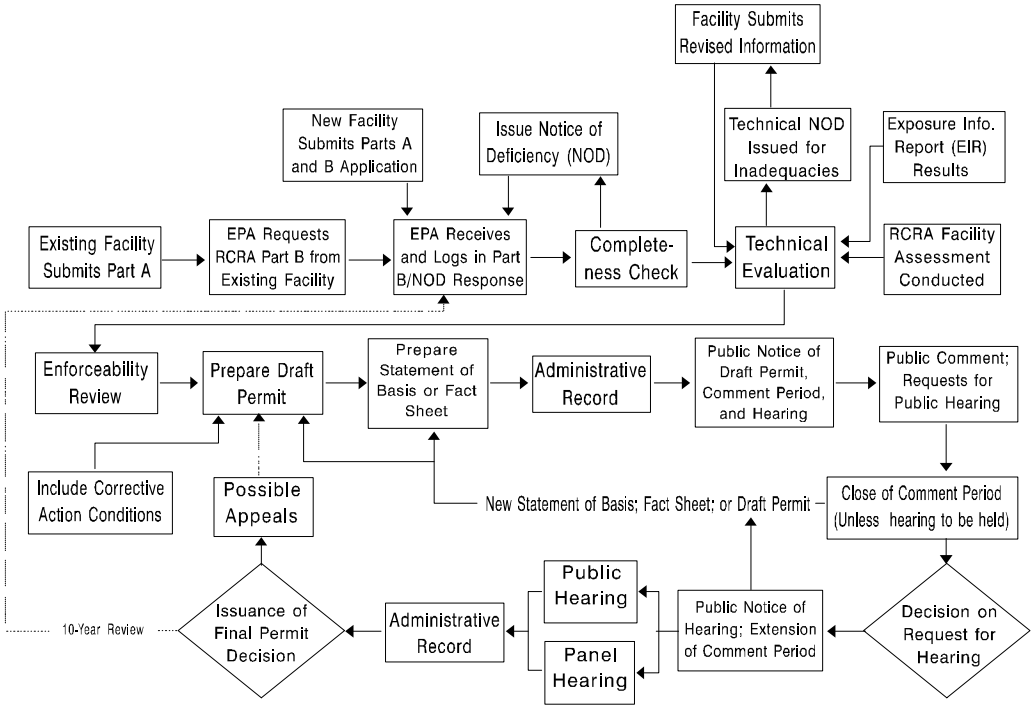
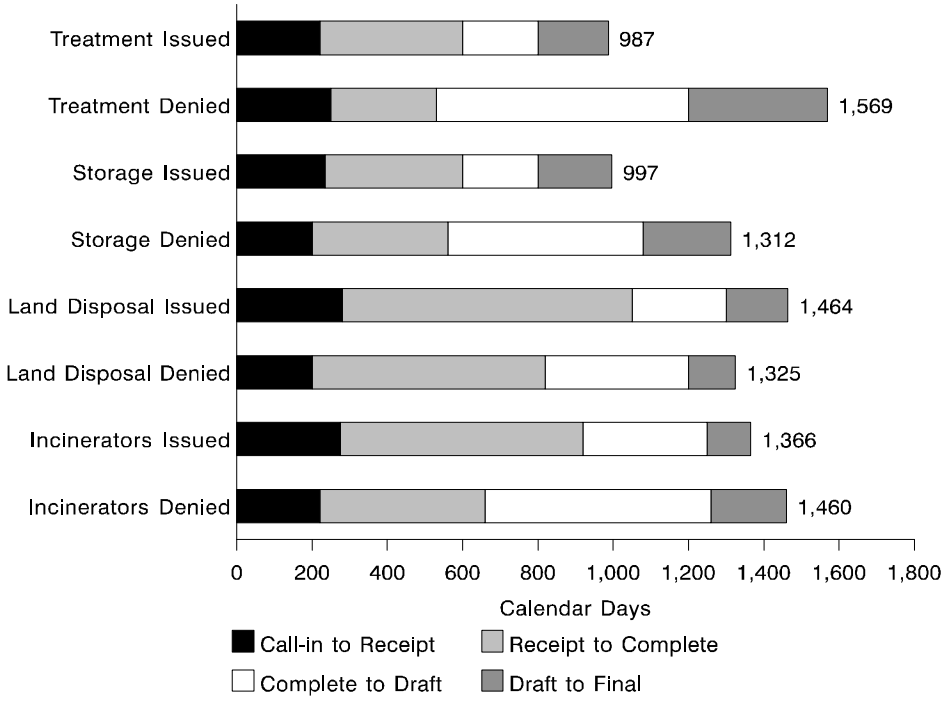


Figure 6
Permit Review Process is Excessively Long



D. Rather Confusing Recycling Applicability

"The people who wrote this ought to go to jail. They ought not to be indicted, that's not enough."[44] This is a federal judge commenting on the recycling provisions of RCRA.

The EPA's position is that RCRA applies to recycled materials, though this point has generated considerable controversy.[45] On the one hand, one could argue that recyclable materials haven't been "discarded" and aren't subject to regulatory control.[46] On the other hand, while granting exclusions for certain recycled materials—like reclaimed industrial ethyl alcohol, used batteries returned for regeneration, used oil that exhibits a hazardous waste characteristic, and scrap metal[47]—EPA has consistently asserted its authority to regulate some recycled materials on general health and environmental protection grounds.[48] After all, "hazardous waste management" includes the recycling practices of source separation and recovery, by statutory definition,[49] and other provisions of RCRA also apply to the recycling of materials that are considered "solid waste."[50] EPA noted that the terms "resource recovery," "resource recovery facility," "resource recovery system," and "recovered resources" all involve the recovery of products from solid waste, thus implying that materials remain solid wastes subject to RCRA even when they are recycled.[51]

So whatever "recycling" is, RCRA applies to it and doesn't apply to "virgin" materials used as commercial products—even though recycling operations are already subject to the same environmental regulations as comparable activities using virgin materials, like the Clean Air Act,[52] the Clean Water Act,[53] the Occupational Safety and Health Act,[54] Superfund, the Emergency Planning and Community Right-to-Know Act,[55] and the Toxic Substances Control Act.[56] Many perfectly acceptable and reusable (and regulated) raw materials—salts of heavy metals, acids, toxic solvents, water-reactive materials, and so on—become RCRA hazardous wastes the moment they are "discarded," whatever that means, which virtually guarantees that few people will recycle them.[57]

The market advantage this grants virgin materials should be clear enough.[58] But there is no *environmental* basis for distinguishing between the management of raw materials and the management of recyclable materials; industry regularly and safely uses virgin materials that are more hazardous than the "hazardous waste" they produce.[59] Various EPA reports have charged that ecological risks posed by RCRA wastes aren't being assessed,[60] and have urged that the definition of solid waste be changed to conform more closely to actual environmental risks.[61] Both can cause environmental harm, but RCRA unnecessarily requires the EPA to distinguish between the two.

So the EPA can't draw a line that relies exclusively on environmental concerns[62] to distinguish between "sham" recycling—harmful practices that might masquerade as recycling—and "true" recycling, which is a good thing. And yet, the law requires that it draw one. What sort of line can it draw? An inconsistent one. EPA considered various approaches to regulating recycling activites—not classifying them as wastes at all, using a standard based on value (if someone other than the generator is paid to recycle it, it's O.K.), or using a standard based on "whether materials are typically dealt with as commodities." It rejected them all. Nor does EPA accept "the argument that a potentially harmful recycling practice is invariably subject to regulation... since potential environmental harm is not always a determinative indicator of how closely a recycling activity resembles hazardous waste management."[63]

And even though RCRA does apply to some recycled materials, it's unclear to what extent. What is clear is that regulation of resource recovery practices is increasing, as the EPA becomes concerned with more and more risks and comes to encompass materials under RCRA that can't be clearly distinguished as a waste or a recoverable resource.[64] The regulations appear to subject hazardous waste reclamation facilities to permitting, financial responsibility, and other significant requirements,[65] except when these facilities do not store the wastes before reclaiming them,[66] in which case they do not need to obtain a permit or provide proof of financial responsibility and are only subject to notification and manifesting requirements. Even this exemption is not a simple matter, since all reclamation facilities "store" wastes, if only temporarily, before reclaiming them. The regulations don't say how to distinguish between temporary and long-term storage. The EPA's confusing organization of its other requirements adds to the difficulty.[67] The regulations for recycled materials are "horrendously complex, make fine distinctions that have significant regulatory consequences, and simply do not seem to have a coherent basis."[68]

The line between waste treatment and waste recycling is often a judgment call. For example, if a product is manufactured for sale and generates "significant revenues," then the process is classified as "recycling" and becomes exempt from some of RCRA's control. This criterion doesn't appear anywhere in the regulations, but the EPA has adopted it as a rule of thumb to distinguish between "sham" recycling and "true" recycling. As a deputy EPA administrator put it in congressional testimony, "We look at such things as, is there apparently an economically viable amount of material in the material being treated? In other words, do you have enough zinc or some other material in the material you are allegedly recovering to make anyone believe that you really are burning for recovery as opposed to burning for disposal? We look at the amount of revenue that you derive from this. It is something of a judgment call."[69] "Believability," not the physical characteristics of the recycling process, is a key concept. A particular application of the significant revenues criterion can be seen in the enlightening banter at the same hearing between a Mr. Eldredge of (the admittedly shady) Marine Shale Processors and Senator Breaux:

> "*Senator Breaux.* Let me ask you this: Does Marine Shale consider yourself a business that is in the hazardous waste destruction business, or do you consider yourself as a business that produces a byproduct that is for sale?
> *Mr. Eldredge.* We are in the business of manufacturing a product.
> *Senator Breaux.* All right. The 1986 figures that we have from Tulane University indicate that in 1986 you made $100,000 producing the aggregate, and that in 1986 you were paid $12.8 million for burning hazardous waste. Now do you consider that a successful business, if you are telling this committee that you are in the business of producing aggregate?"[70]

But how "significant" do these revenues have to be? This is open to interpretation. Suppose, for instance, that a kiln—one that meets air pollution regulations as strict as those for hazardous waste incinerators—processes hazardous wastes and produces a slag that passes the Toxicity Characteristic Leaching Procedure, an EPA toxicity test that measures how much of a hazardous substance can leak out into the environment. If the slag meets the criteria defined in Subtitle D of the land disposal regulations[71] (which include passing the TCLP and meeting the "significant revenues" criterion), then the plant can be classified as a recycling facility, and the slag can be sold and used as road ballast, gravel, a constituent of asphalt, and so on. On the other hand, even if the slag passes the TCLP, it may not meet the "significant revenues" criterion. In this case, the kiln could be classified as a hazardous waste facility, and under the "derived from" rule, the slag has to be disposed of in a hazardous waste landfill.[72] The slag is the same; only the revenue assessment differs in this instance.

And the federal courts haven't helped resolve the problem. The first appellate court decision interpreting the regulations, *American Mining Congress v. EPA*,[73] limited EPA's authority to regulate recycled materials: "Congress clearly and unambiguously expressed its intent that `solid waste' (and therefore EPA's regulatory authority) be limited to materials that are `discarded' by virtue of being disposed of, abandoned, or thrown away."[74] The idea that "waste" regulations should only apply to materials that are "discarded" in the ordinary sense of the word has intuitive appeal. But RCRA wasn't written that way. Congress certainly did intend that used oil be classified as a hazardous waste, at least if it was hazardous enough.[75] Two later decisions, *American Petroleum Institute v. EPA*[76] and a second *American Mining Congress v. EPA*,[77] interpreted the original decision to mean only that RCRA did not apply to materials which were to be immediately reused by the industry in question.[78]

E. Result: Corporate Recycling Abates

This uncertainty is a disincentive to getting permits. It is also a hassle for companies that want to send their wastes to be recycled, but are afraid that the recycling facility may eventually be declared a hazardous waste site (and that they may be subject to Superfund liability[79]) because of a process determination, not based on whether or not the product is hazardous. The EPA's distinctions are important because they affect all recycling operations—and sometimes they destroy the incentive to recycle instead of throw away.[80] The laws applying to recycling are difficult to understand and implement, and the consequences of recycling are uncertain. For many, this becomes an unacceptable risk, and this risk often leads to avoidance.[81] Even the EPA concedes that the current regulations are difficult to implement and discourage safe recycling of hazardous waste.[82] Even if the recycling facility itself is exempt from RCRA permit requirements, all ancillary operations, like receiving, storage, and handling, still need RCRA permits. And if a commercial recycling

facility increases its capacity, it has to revise its National Pollutant Discharge Elimination System water pollution permit to authorize the increased flows or changed composition.[83] Moreover, there is no viable permitting process for testing innovative technologies for environmental purposes; RCRA's "research, development and demonstration" permits are ineffective, "delegated to fewer than 10 states," and with "only a handful of permits issued."[84]

According to the "Definition of Solid Waste Task Force" formed by the EPA in October 1992:

- the definitions of solid and hazardous waste are too difficult to interpret;
- the permitting process is costly and time-consuming and provides little certainty of the outcome;
- there is an uneven playing field between recyclables and virgin materials;
- the present system stigmatizes hazardous waste recyclables;
- the states often interpret the regulations inconsistently; and
- permit modifications are too burdensome and sometimes are irrelevant to actual risk.

As a result,

- businesses are reluctant to invest in recycling;
- recyclers have a harder time competing with virgin material producers because waste-derived products have a lower value than they otherwise would;
- consumer costs are raised, natural resources wasted, and creation of new jobs and technology is stifled; and
- enforcement focuses too often on paperwork violations.[85]

Also, states can add substances to the EPA list under their own hazardous waste control programs. In 1985, 16 states listed PCBs and 14 states listed waste oils, neither of which were considered hazardous by the EPA's standards. Several states have also added additional toxicity characteristics.[86]

III. SOME CASE STUDIES

It is difficult to quantify how many wastes which could be safely recycled are instead disposed of. Here are three examples of missed recycling opportunities, but there are many more (see Tables 2–4[87] for a more comprehensive listing).

Table 2: Regulations That Can Inhibit Recycling of Industrial Hazardous Waste

Rule	Effect on Recycling
• Distinctions between raw material and solid waste (40 CFR 261.2)	• Unless the hazardous component of a waste is recovered or used (even though it may be a very minor component) the process is declared to be hazardous waste treatment, not recycling.
• Derived-from rule; i.e. products made from listed hazardous wastes are hazardous [40 CFR 261.3(c) and (d)]	• Prohibits reuse of by-products from treatment of listed hazardous waste unless they are formally delisted (products from characteristic wastes can be reused if they no longer have any characteristics of hazardous waste).
• Boiler & industrial furnace rules (40 CFR 266.100–266.112)	• Requires performance equivalent to that of a hazardous waste incinerator for the regulated furnaces; may limit the availability of capacity.
• Hazardous waste storage requiring a permit [40 CFR 262.34(a) and (e) and (f), 261.6(b), (c.1 and c.2)]	• 1,000 kg or more of hazardous waste accumulated in a month and kept more than 90 days by a generator requires a hazardous waste permit; can prevent accumulation of wastes for an economical recycling campaign, or for sending to a recycler.
• Permitting for treatment (40 CFR 264 Subparts A-R)	• Requires a long time, is expensive, requires public hearings and the outcome is uncertain; often viewed as too expensive for the potential savings from recycling.
• Complexity of delisting petitions (40 CFR 260.20 and 260.22)	• Delisting is needed to use a treated by-product of a listed waste; delisting is sufficiently time-consuming and expensive to be used in industry only for large quantities of continuously produced waste streams.
• Permits for R&D on hazardous waste	• Pilot plant testing of new treatment or recycling processes requires extensive and expensive

[40 CFR 270.65 and 262.34]	permitting; often discourages development of new treatment or recycling technologies; even changes in an R&D plan require permit changes that add costly delays to the project
• Attaching RCRA Corrective Action to recycling activities (40 CFR 264.100 and 264.101)	• Requires that all potential environmental problems at a facility be rectified before a Part B permit can be obtained; discourages companies from changing processes or treatment to better sytems because of unknown potential cleanup costs.

Table 3: Missed Opportunities: Recyclable Wastes That Have Been Disposed of Instead

Recycling Opportunity	Reason for Avoidance of Recycling
• Use of rice hull ash in glass manufacture. The ash has the same composition as sand, a raw material used in glass, and thousands of tons of ash are generated annually.	• California regulators determined that the ash is a more serious health hazard than sand.
• Use of aluminum smelter potlinings in mineral wool production or in cement kilns.	• Potlinings were recycled in these ways but recently became a listed hazardous waste; no cement kilns or other user so far is willing to obtain a Part B permit in order to use it.
• Use of electric furnace steel dust in cement manufacture.	• As soon as it became a listed hazardous waste, cement kilns would no longer recycle it because they neither had nor saw prospects for an economic incentive to justify obtaining a Part B permit to use it.
• Use of aluminum hydroxide chemical milling wastes in cement.	• Generator fears it might be judged to be sham recycling and thus landfills the material instead; generator did prove that its use in the cement kiln was beneficial.
• Reuse of nonhazardous catalyst.	• A nonhazardous catalyst was used to make a hazardous material and is contaminated with the hazardous residue; the catalyst is land-filled rather than recycled.
• Exchanging or selling a surplus virgin chemical.	• Generator fears listing in waste exchange because the state may interpret that as declaring it as waste and decree that the RCRA 90-day storage rule applies from day of listing; no buyer might be found within 90 days, and the state offered no clear resolution of the problem.
• Use of listed petroleum wastes in a fluidized catalytic cracker.	• Company fears that the unit's oxidizing section for the catalyst would be declared a hazardous waste incinerator, and that might trigger a Part B requirement and RCRA Corrective Action for the entire process.
• Recycling of printing plates by the manufacturer after customers use them.	• To recycle the plates, the manufacturer must apply for a Part B storage permit; company currently has good public image and fears becoming known as a hazardous waste recycler in a public hearing. Customers also may need Part B storage permits to store the plates long enough to justify shipment.
• Use of galvanizing dusts with 40% Zn.	• Could not find a user because of failing the Toxicity Characteristic Leaching Procedure (Appendix 1 of 40 CFR 268); product would normally be considered a very high-grade and valuable raw material.
• Reuse of off-spec “Dowtherm.”	• Required filtration of a hazardous material to recondition it, which in turn requires permits that neither customer nor manufacturer had.
• Recovery of hydrochloric acid from a listed waste (K018 Still Bottoms).	• Cost and 2- to 6-year time frame from RCRA permit to proceed exceeded the benefits.
• Reuse of empty drums.	• Fearing that the recycler/reconditioner might make a mistake and make the generator a potentially responsible party (PRP), generator decided to crush and landfill all spent drums instead.
• Reuse of surplus chemical reactors and process equipment.	• Because of fear of inability to prove decontamination, company preferred to landfill the equipment.
• Use of empty brine caverns for storage of petroleum.	• Caverns were plugged because of fear of future liability if something went wrong.

Table 4: Examples of How Regulatory Barriers Have Eliminated Pollution Prevention and Waste Minimization Opportunities for Some Major Industrial Wastes

Industry	Waste	Barriers	Comments
• Aluminum	• Spent Potlining-K088	• Distinction between raw material and solid waste • Derived from rule • Burning rule • Permitting (for storage)	• Santee Cement Co. terminated receipt of potlining to avoid permitting. Fluoride was beneficially being used in cement while cyanide was being destroyed. Tests had demonstrated no adverse environmental impacts from potlining addition to cement kilns. Potential reuse of 50,000 tons/yr eliminated because of regulatory barriers. • Use of potlining as a fluoride mineralizer by American Rockwool, who was paying comparable raw material prices for potlining, terminated because of permitting requirements, derived from rule and burning rule. Extensive tests had demonstrated environmental impact or mineral wool plant improved with use of potlining. Reuse of 7,000 tons/yr of potlining prevented by regulatory barriers.
• Woodtreating	• Wastewater treatment sludge from creosote and/ or pentachloro-phenol-K001	• Derived from rule delisting	• Ash from the incineration of K001 waste is completely inert. Yet, due to the derived from rule it is classified as a RCRA hazardous waste. Delisting is a long, drawn-out process, resulting in a completely inert material being landfilled and consuming valuable space in a hazardous waste landfill.
• Chemical	• Various organic chemicals	• Rules pertaining to amount of waste which a research and development laboratory or pilot plant can process.	• Research is underway concerning the biodegradation of organic hazardous wastes which requires receipt, storage, and treatment of the wastes. Current rules discourage such work due for the time and quantity restraints imposed by RCRA.
	• Still bottoms-K018	• Distinction between raw material and solid waste permitting (construction)	• A process to thermally oxidize K018 wastes, recovering both energy and chlorine in the form of hydrochloric acid has been developed. The 2-6 years time and the cost to obtain a RCRA permit plus the corrective action investigation imposed on an entire chemical plant have resulted in abandonment of the technology.
	• Offspec Dow-therm	• Permitting (one-time treatment requirement) • Offsite storage prior to reuse or recycle	• Dowtherm became contaminated at customer's plant. It could have been filtered and reintroduced into customer's process. But it could not be stored for treatment at the customer's site and the original manufacturer could not receive it back since he did not have a permit to treat offspec hazardous "waste." The offspec Downterm was sent to an incinerator for disposal, a less than desirable or optimum environmental solution.
	• Wastewater recycling	• Derived from rule	• Treated wastewater from a RCRA permitted wastewater treatment facility cannot be considered for reuse/recycle in noncritical process applications because of previous association with a listed waste. Resources that might otherwise have been conserved are disposed of, consuming other valuable resources—fresh water makeup and landfill space.
	• Various secondary materials	• Distinction between secondary material and solid waste. • Permitting (for storage)	• Many secondary materials (coproducts) as well as unused reactants and diluted materials have intrinsic value if they could be recycled. However, for this to be done, some recovery (purification, concentrating, or other cleanup) is necessary. Current RCRA waste definitions preclude this from being done except under the harsh RCRA regulations. Many times storage awaiting equipment availability as well as storage for quantity accumulation is necessary. Presently such storage requires a RCRA permit. A storage exemption for reusers/recyclers similar to the 90 day storage provision for generators is needed.
• Petroleum	• API Separator Sludge K051	• Distinction between raw material and solid waste • Permitting (for storage)	• Coke produced from petroleum hazardous waste containing oil at the same refinery which generated the waste is exempt from RCRA. For a refinery which does not produce coke, the oil would have to be shipped offsite to a refinery having a coker. The offsite refinery would be regulated by RCRA, which effectively eliminates this reuse alternative.
	• Various RCRA Characteristic Wastes	• Burning rule • Derived from rule	• Characteristic wastes generated in a petroleum refinery could be burned for energy in a FCC unit. The burning rule would require the entire FCC unit to be permitted as a RCRA treatment facility. The owner, in order to avoid having to permit the FCC, chooses not to burn the characteristic waste, thereby losing the capacity of the facility for environmentally sound reuse of these characteristic wastes.
	• Dissolved Air Flotation K048 • API Separator Sludge K051	• Delisting	• Under current regulations, once a waste is listed as hazardous it must be handled and disposed of as such even though it may no longer be hazardous. The cost of disposal remains the same for listed wastes that have been reused/recycled and for wastes which have not. Delisting is theoretically an option but in reality a virtual impossibility. There is simply no incentive to pursue reuse/recycle.

A. The Case of Lead; or, the Assault on Batteries

Lead is produced from lead ore. The nonlead elements in lead ore[88] are removed by flotation methods, which separate the lighter elements from the heavier ones. Once that's done, the remainder is smelted in a furnace. This process produces a waste product called slag.[89] The recycling of lead from used lead acid batteries also produces slag. Primary lead slag is not regulated as a hazardous waste under RCRA;[90] the Bevill Amendment, which excludes certain mining wastes from Subtitle C regulation, specifically exempts it.[91]

But while primary lead slag is chemically and physically virtually identical to secondary lead slag, secondary lead slag can be considered a hazardous waste. In January 1985, spent lead acid batteries were designated as a hazardous waste under RCRA.[92] Since secondary lead slag is a by-product of spent batteries, it's considered hazardous because of the "derived from" rule unless you can prove otherwise. In other words, secondary lead slag is strangely considered hazardous, just because it comes from spent batteries, even if the hazardous constituents have been removed and the residue is in fact benign.

"Benign," of course, is a tricky term. Wastes can be considered "hazardous" if they exhibit a hazardous "characteristic," but that can all depend on what test is being used. There are the Toxicity Characteristic Leachate Procedure (TCLP), the Synthetic Precipitation Leachate Procedure (SPLP), the EP Toxicity Test, the Structural Integrity Procedure—and all of these have been used at different times for different substances. So something that's "hazardous" under one test might not be "hazardous" under another test.

Here's where it gets confusing. If slag exhibits a hazardous characteristic, the lead can still be considered nonhazardous if it's reclaimed.[93] The trouble is that while the lead is considered reclaimed, the slag is *not*. This means that lead recyclers, after getting some lead out of a used battery, may still have a hazardous waste on their hands. This changed slightly in September 1994, when the EPA released new land disposal restrictions[94] that expanded the so-called "closed-loop" recycling exclusion. The exclusion says that if a substance is reinserted into the same process it came from, it's exempt from Subtitle C regulation. Why do we care about this? Because even when you get some lead out of slag, the slag still has some more lead in it, and so you can put it through the recycling process again (at great cost). So long as you keep trying to get more lead out of the slag, you're reinserting the slag into the same recycling process, and so the lead you get out of it isn't considered hazardous. Of course, once you're done with that, the slag you have left could still be considered hazardous.

Historically, most secondary lead slag has passed the applicable tests (like the EP Toxicity test or the Structural Integrity Procedure).[95] However, in September 1990, the EPA started to use the TCLP, a stringent test which aggressively measures leachability, or how much of a substance can leak out into the environment, by making expansive assumptions about how materials would leach in a landfill. Most secondary lead slag fails this test. The EPA has exempted lead acid automotive battery recyclers from most of the reporting, recordkeeping, manifesting, and notification requirements,[96] but the slag is still considered hazardous waste.[97]
It isn't clear that the TCLP is the best way to judge the toxicity of lead slag. The TCLP requires that the slag be finely ground, which destroys its structural integrity and doesn't reflect actual disposal conditions. In the real world, slag is produced in solid, 2000-pound ingots or "buttons," which are put in industrial landfills that are specially designed for lead-bearing materials. The TCLP also says that after the slag is ground, it should be exposed to acetic acid, which is a selectively strong solvent for leaching lead. Why acetic acid? Acetic acid was chosen on the assumption that the slag would be thrown into municipal waste dumps, which might have rotting food and therefore acetic acid. But this goes against the historical practice of the secondary lead industry, which is to monofill its slag—that is, put it in a landfill with nothing else.[98] It makes more sense to make the hazardous status of lead slag depend on what you do with it. If you put it into a municipal solid waste landfill, it could be considered a hazardous waste, and if you monofill it, it could be exempted from RCRA Subtitle C.

In short, primary and secondary lead slag are virtually identical; primary and secondary slag management practices are substantially similar; and yet, primary slag is "nonhazardous" and secondary slag is "hazardous." In addition, used lead acid batteries aren't even considered hazardous wastes at all until they enter the recycling plant. Used batteries sitting on the shelf in someone's garage aren't hazardous wastes; used batteries waiting to be recycled at the secondary smelting plant are.[99] This regulation, which is based on industrial origin, and not on chemical or physical characteristics, puts the secondary lead industry at an economic disadvantage.[100] Because the recycling facility is regulated as a waste site, it has to comply with regulations designed for landfills—keeping track of where each battery came from and how long it took before it was actually recycled, building impervious floors to protect the groundwater, and so on. Maybe such requirements are necessary for landfills, where waste is actually being discarded. But why recycling facilities, if the identical virgin material is exempt from such requirements?

And if a particular batch of slag fails the TCLP, the recycler has to dispose of it at a licensed landfill, where tipping charges are on the order of $100 to $200 per ton. Part of this covers the operating costs of the landfill, and part goes to the federal government—essentially, a RCRA/Superfund tax. Inspections of secondary slag occur periodically—quarterly, for instance. If a batch of slag passes the TCLP, it's considered nonhazardous. If it fails, then the recycler is allowed to test 1,000 more such batches. If all 1,000 pass the test, then the first failure is not counted, and the slag is considered nonhazardous. On the other hand, if one of these 1,000 batches of slag fails the test, then the slag is considered hazardous until the next inspection, which may not be for a few months. This means that the recycler can incur increased landfill costs for a long time. And tipping charges of $100 to $200 per ton are a lot, in a lead market where the price of lead over the last five years has averaged less than $500 per ton. Because primary and secondary lead are substitutes, and because primary lead prices vary so much, secondary lead is only viable when primary lead is expensive—which doesn't always happen. Several years ago, the newly liberated countries of Eastern Europe sold their inventories of various metals on world markets to get hard currency; the price of primary lead was low for a while because of this. Moreover, American lead is already at a competitive disadvantage because many countries subsidize their primary lead production.[101]

These are only some of the problems of the secondary lead industry; there are more issues which are too complicated to go into here. But the basic moral of the lead story is that primary lead and secondary lead shouldn't be treated differently. U.S. secondary lead-smelting capacity dropped from 1.4 million metric tons in 1980 to 882,000 metric tons in 1986,[102] as many smelters closed because they couldn't or didn't want to deal with the increased costs of complying with RCRA. Since then, capacity has increased to 1.073 million metric tons in 1993, because of improving technology, increasing scrap availability, and economies of scale from the expansion of those modern facilities that weren't squeezed out during the '80s by regulations.[103] Still, capacity is less than it was 15 years ago. On the other hand, 1.428 million tons of lead were consumed in the United States in 1993;[104] about 80 percent of that went into batteries.[105] Despite the reduction in secondary smelting capacity, about 60 percent of the demand was supplied by secondary smelters—876,000 tons in 1993, about 90 percent of which came from batteries.

The recycling rate for lead batteries is actually high—hovering between 80 percent and 95 percent (closer to 95 percent) over the past several years—despite the burden of RCRA regulation. This is partly because lead battery disposal is illegal in 42 states, partly because sellers of new batteries have to take old ones back in 37 states, and partly because lead battery recycling has been around for 70 years. But saying “There shall be recycling” isn't enough to make it so, especially when the costs of regulation are high. The number of battery recyclers has gone down from over 40 in 1980 to 18 in 1993;[106] so far, the remaining recyclers have taken up the slack, but there's no guarantee that the high recycling rates will continue into the future, especially if RCRA becomes any more stringent. These regulations make secondary lead processing unnecessarily expensive; if it weren't for the exemption that makes lead batteries nonhazardous until they reach the smelter, the recycling rate would be quite low.

B. RCRA Foils Aluminum Industry

Aluminum is made by converting bauxite ore into alumina (Al_2O_3) and then by reducing the alumina into primary aluminum metal. The electrolytic process that converts alumina into aluminum takes place in “pots,” made of a steel shell lined with insulation and carbon. The EPA calls the carbon portion of the shell “potliner.” Potliners are replaced after three to seven years; spent potliners contain an average of 60 tons of a heterogeneous mixture of carbon, aluminum, sodium, fluoride, silicon, calcium, and trace amounts of cyanide and iron. The domestic aluminum industry generates about 115,000 metric tons of spent potliner material each year.[107]

The EPA classified spent potliner as a solid waste in 1988 because potliner is taken from a process in which it is no longer used and the recovery processes are “not characterized by ongoing, continuous production processes.” True, fluoride is recovered from spent potliner; but this recovery process is not part of the aluminum reduction process, and so it becomes waste treatment.[108] Potliner was also listed as a hazardous waste[109] because of cyanide contamination concerns.[110] It is still listed.[111]

Spent potliner, however, is not waste.[112] Mineral wool plants have used it as a source of fluoride and as a fuel substitute for coke. Cement kilns have used it as a fuel supplement to replace 2 to 5 percent of their coal; the fluoride in the potliner increased the reaction process in the kilns, reducing fuel costs with no ill effects on production or cement quality. Steel

plants have used the carbon as a fuel source, and the fluoride as a substitute for the fluxing agent, fluorspar.[113] Potliner recycling was an economically viable alternative to land disposal. In March 1988, before the listing, 22 percent of the total generated spent potliner was being reused by the cement, mineral wool, and steel industries. Since land disposal cost $188.50 per ton in 1989, and recycling would have cost $37 per ton, recycling 22 percent of 130,000 tons of potliner would save the aluminum industry $3.8 million.[114] Moreover, the mineral wool, cement, and steel industries would have saved $4 million in fuel costs.[115]

The main justification for the listing of spent potliner as a hazardous waste was the possible cyanide contamination. But actual recycling practices posed little danger of cyanide contamination:

- The high temperatures of the combustion process destroy cyanide.[116] In fact, the burning of potliner by the reuse industries may well be the best treatment method for this "hazardous waste." But the listing of potliner has effectively discouraged this practice.

- There was a theoretical danger that the groundwater would be contaminated—either by cyanide seeping into the ground during storage and handling while the potliner was waiting to be burned, or by cyanide seeping into the ground while it was in a landfill.[117] But such contamination is unlikely, whether the cyanide leaches or not. Cyanide is easily biodegradable—whether it's decomposed by sunlight or eaten by bacteria in the soil—and is unlikely to accumulate in normal soils.

Since the listing, nearly all recycling efforts have stopped, since the potliner transporters and recyclers would now have to deal with RCRA regulation. Moreover, the ash left over after the coal and potliner are burned would now be considered a hazardous waste because of the "derived from" and "mixture" rules; this means that the reuse industries would become generators of hazardous waste and have to deal with the same indefinite increases in liability risks as the aluminum industry.[118] The aluminum industry has been putting its spent potliner into on-site storage enclosures or hazardous waste landfills.[119]

Recycling of spent potliner may start up again in the future, but it will be no thanks to RCRA. Once the expected ban of the landfilling of spent potliner goes into effect (which should happen in January 1996),[120] potliner generators will either have to treat it or recycle it. Reynolds Metals has recently opened a $50-million plant in Gum Springs, Arkansas, to convert spent potliner into a nonhazardous waste; this plant is designed to handle the entire U.S. potliner capacity.[121] Whether the potliner will be recycled is another story; the treated potliner will no longer be a good alternative fuel source, and Reynolds Metals is looking for ways to use it in roads and building construction. Eventually, Reynolds hopes to treat all spent potliner and reuse it all, but this will probably take some time.[122] In any case, tearing down an economically viable recycling industry only to build a new one eight years later is a slow and inefficient way to encourage recycling.

C. The Slippery Case of Used Oil

RCRA requires the EPA to establish standards for recycled used oil that would protect public health and the environment, and that wouldn't discourage recycling.[123] In 1980, the EPA decided to consider used oil exhibiting a hazardous characteristic to be a hazardous waste.[124] In 1985, the EPA proposed to regulate all used oil as a hazardous waste.[125] But in 1986, it changed its mind, recognizing that a hazardous waste listing would discourage recycling of used oil. Service stations would be reluctant to accept a hazardous waste, with all of its stigma and regulatory costs, from the public, and industrial burners would be reluctant to burn used oil as fuel.[126] Instead of recycling used oil, people would illegally dump it on the ground, in the trash, or in sewers. This would hinder the used oil collection programs that are necessary to ensure that used oil is recycled. Ninety-five percent of "do-it-yourselfer" oil was still improperly disposed of in 1988:[127] an estimated 200 million[128] to 450 million[129] gallons of used oil were illegally dumped annually. To put that number in perspective, about 10 million gallons of oil were spilled by the Exxon Valdez.

The EPA's decision was challenged in court by the Hazardous Waste Treatment Council and other organizations. The petitioners claimed that:

- RCRA allowed the EPA to consider technical characteristics of hazardous waste, but not the stigma of a hazardous waste listing; and

- Congress intended the EPA to consider the effects of listing on the recycled oil industry only after used oil had been listed.[130]

The resulting decision, *Hazardous Waste Treatment Council v. EPA*,[131] held that the EPA had acted illegally in delisting used oil. The court, in effect, told the EPA to either list used oil as a hazardous waste or find a technical reason not to.

In September 1991, the EPA eventually decided that listing used oil as a hazardous waste might not be necessary if it promulgated used oil management standards that would protect human health and the environment. In 1992, it published a set of *Federal Register* notices delisting used oil and promulgating comprehensive used oil management standards. It recognized, in effect, that not all used oil meets the technical criteria for listing a waste as hazardous[132] and that recycled used oil doesn't substantially threaten human health or the environment when managed properly from the time of generation to the time of recycling.[133] Now, used oil is only classified as a hazardous waste under RCRA if it is mixed with hazardous waste or if it contains more than 1,000 ppm total halogens.[134] (Halogens are contaminants, like chlorine, that can appear in used oil.) The management standards are mostly record-keeping and notification requirements, though recyclers also have to abide by general facility standards for preparedness and prevention.[135] These management standards are generally more stringent than the previous federal standards, which also exempted used oils but only provided management standards for the burning of off-specification used oils.[136] Many states which had independently listed used oil as a hazardous waste are now reconsidering their positions. Missouri has delisted used oil since August 1994.[137] New Jersey was planning to adopt the new federal rules by Spring 1995;[138] it hasn't so far, but has announced that it would do so by Fall 1995.[139] The only other states that list used oil as a hazardous waste are Massachusetts, Rhode Island, and Vermont.[140]

- In Massachusetts, recyclers and marketers have to get a permit, make annual reports of used oil activities, and notify the Massachusetts Department of Environmental Protection and the EPA of off-specification oil burning activities.[141]

- In Rhode Island, transporters of used oil have to get a hazardous waste transporter permit and an alternative waste oil manifest, and submit their vehicles for inspection by the Rhode Island Department of Environmental Management (DEM). The DEM can designate collection facilities as facilities which have to accept used oil from the public. Burning oil in fuel-burning equipment with a heat capacity of over 1 million btu/hr is prohibited without the DEM's approval. Alternative fuel, including waste oil, must meet state standards and provide the DEM with a lab analysis.[142]

- In Vermont, transporters of used oil have to be certified, keep records, and in certain circumstances get a hazardous waste haulers license from the state. Used oil can only be delivered to a burning facility in compliance with Vermont's Air Pollution Control regulations. Used oil burning equipment should have a maximum heating capacity of at least 1 million btu/hr and a combustion efficiency of at least 99 percent, and should comply with visible emission limitations. If the used oil burning equipment has an operating heat input rate of 10 million btu/hr, the burner has to get an air permit; if the operating heat input rate is between 1 million and 10 million btu/hr, the burner has to notify the Air Pollution Control Office before proceeding.[143]

Of course, from an environmental standpoint, state hazardous waste listing is better than federal hazardous waste listing, because if at least a single state does *not* list used oil as a hazardous waste, people will be able to bring their used oil to that state to be recycled. Still, bringing used oil to another state is a cumbersome process—even in a small state like Rhode Island—because of the general inconvenience, not to mention hazardous waste transportation regulations. For the hundreds of thousands of do-it-yourself oil changers, participation in the used oil recycling system is entirely voluntary, and discouraging local used oil collection centers is an option that the environments of Massachusetts, Rhode Island, and Vermont can ill afford.[144]

D. The California Used Oil System

California has a more complicated used oil listing system.[145] California has been managing used oil as a hazardous waste since the 1970s. The "hazardous waste" designation officially became effective in 1983, and the enforcement of certain used oil regulatory provisions was strengthened in 1986, when SB 86 codified many of the previous practices and clarified the status of used oil under California law.[146]

In California, at the beginning of the process, generators (that is, the service stations that generate the used oil) are generally exempt from the law, though they have to keep receipts from the hauler who transports the oil to the recycling facility for three years.[147] At the end of the process, buyers of used oil are not subject to the hazardous waste management system; as long as the seller of recycled oil makes sure that the oil meets specifications, the oil is exempt from the "derived from" rule. It is only in between the generator and the end user that the used oil is considered a hazardous waste. The specifications limit, among other things, the amount of metals (lead, chromium, cadmium) in the oil, the total halogen content (3000 ppm or less), and the PCB content.[148]

If the oil isn't contaminated or already meets recycling standards, it can be certified as never having been a hazardous waste.[149] But if it is contaminated, transporters and recyclers have to manage it as a hazardous waste under California law.[150] Transporters have to register and have financial assurance, and they are subject to inspection for the adequacy of their brakes, lights, and other equipment.[151] Transporters also have to check each batch of used oil that they pick up from service stations to make sure it meets specifications. If it does, it can be recycled; otherwise, it has to be disposed of at an appropriate disposal facility. Recyclers have to comply with normal permitting requirements, like financial assurance, corrective action, and emergency response plans, and they have to test incoming oil to make sure that it meets specifications.

Technically, the transporter doesn't have to test the oil until it reaches the recycler. But used oil is considered a hazardous waste in California if it contains more than 1000 parts per million of halogens. So one batch of contaminated used oil can ruin a whole tank of "good" used oil, and therefore haulers have to test each incoming batch. The costs of testing can be substantial. One common type of test, using a device called Chlor-Detect, takes about 20 minutes to run; an oil collector making 10 stops a day has to spend about 3½more hours to collect the same amount of oil. Less oil is collected, each test costs about $20 per tank, and haulers have to pay between $2 and $3 per gallon to dispose of used oil at a RCRA permitted facility, instead of receiving about 10 cents from a recycling facility. All these costs are either absorbed or passed onto the service station; the hauler can charge fees of $20 or more. A $20 fee for a 100-gallon pickup comes out to $0.20 per gallon, which is sometimes a 100-percent increase in the cost of collection. A service station, unwilling to risk having to pay $3 per gallon to dispose of used oil, may dump the oil down a storm drain or in a vacant field, according to the California Waste Management Board.[152]

The California system succeeds in removing the stigma attached to used oil, at least as far as the do-it-yourselfer and the end user are concerned. Whether it deters dumping is another matter. One would expect that when more restrictions are placed on transporters and recyclers, there would be fewer of them. Also, fewer service stations accept used oil, because the increased costs to dispose of contaminated used oil are passed onto them. In the words of John Gallagher, former chairman of the California Waste Management Board (now the California Integrated Waste Management Board), "One problem [with classifying used oil as a hazardous waste] is that many facilities no longer want to handle used oil because it is now classified as a hazardous waste. Consequently, there are fewer facilities accepting used oil from the public."[153] The number of used oil collection facilities in California dropped from 2500 in 1985 to 1200 in 1988, and the number of used oil haulers dropped from 121 in 1982 to 81 in 1988, because of lower prices paid for used oil deliveries, and lower profit margins (from higher insurance and operating costs). In a business environment where haulers needed $1.2 million and recyclers needed $2 million in liability insurance, many haulers went out of business.[154]

One would then expect that transporters would charge collection centers more money to pick up the used oil, and that the collection centers, in turn, would charge the public more to dispose of used oil. This is, in fact, what has occurred. In 1985, service stations paid the public about 30 cents for their used oil; by 1986, the public had to pay the service stations. The price for used oil collection was about 50 cents, charged to the public, in 1988.[155] Much of the price increase is passed onto the used oil generators, because the recyclers can't pay it—the price of recycled oil, after all, can be no higher than the price of virgin oil, or else no one would buy it. Demand for used oil is very price-sensitive because used oil and virgin oil are near perfect substitutes, and because there isn't a lot of used oil relative to the amount of virgin

oil. (Only about 0.5 percent of oil products are left over as potentially recyclable oil after they are used.) Sometimes, used oil prices are explicitly tied to virgin oil prices.[156]

In short, listing used oil as a hazardous waste encourages the illegal dumping of used oil—precisely the type of environmentally harmful practice that the regulations were designed to fix. Predictably, California's used oil recycling rate was lower than the national recycling rate. In 1988, the California rate was 46 percent,[157] compared to a national rate of 57 percent.[158] By 1993, the California rate had increased to 57 percent,[159] but the national rate had already increased to 59 percent in 1991.[160]

IV. TRI: TROUBLESOME REQUIRED INFORMATION

There are many more examples of RCRA regulation getting in the way of recycling. One brief example—some pigments used in ink, particularly yellows and reds, can be considered hazardous. When wastepaper is deinked, the resulting sludge can be a Subtitle C hazardous waste if the concentrations of ink are high enough.[161] Also, carbonless copy paper, which is used in multi-part forms, used to contain high levels of PCBs before PCBs were banned in the 1970s. Such paper still shows up in the waste stream as governments, which used to use these forms by the ton, clear out their file cabinets—and the PCBs could cause a problem if they were present at high enough levels.[162] So, perversely, mandatory recycled content laws for paper may end up making sludges hazardous and subjecting the recyclers to RCRA regulation. Things may be looking up—the EPA's universal waste rule, proposed in Spring 1995, would allow people to petition the agency to ease regulations on certain post-consumer hazardous wastes to encourage better collection and recycling programs.[163] But there's a long way to go.

Then there's the Toxics Release Inventory (TRI),[164] which is an EPA database that provides information to the public about releases of chemicals from manufacturing facilities into the environment. The TRI is a product of the Emergency Planning and Community Right-to-know Act (EPCRA),[165] and requires certain businesses to file reports with the EPA on their chemical releases. The EPA maintains the list of TRI chemicals. To be subject to the TRI requirements, your business has to hire at least 10 people, and "manufacture, process, or otherwise use" some chemical on the list in quantities above EPA-defined thresholds.

If a business in the manufacturing sector[166] "manufactures" (creates, whether intentionally or incidentally) or "processes" (incorporates into a product distributed in commerce) a "toxic chemical," the threshold is 25,000 pounds per year. If a business "otherwise uses" the chemical, the threshold is 10,000 pounds per year. For instance, suppose you own a business (with more than 10 employees) that spray paints cars. Suppose your spray paint contains the solvent xylene and a lead-based pigment. Xylene and lead are both on the TRI list. The lead is a component of the pigment, so it goes onto the car, which is then distributed in commerce. That's "processing." The xylene, on the other hand, is just a solvent that helps in the delivery of the pigment. It gets onto the car, dissolves, and goes into the air, where it's taken care of by air pollution control equipment, or released through the stack. That's "other use." So if you use more than 10,000 pounds of xylene and 25,000 pounds of lead, you have to report them on the TRI form.[167]

So what has this got to do with recycling? The EPA has been considering adding several industries to TRI's list of entities that have to submit toxic release reports. These entities include waste management facilities, materials recovery and recycling operations, electric utilities, materials extraction facilities, airports, and warehouses. The EPA has acknowledged that including waste management facilities could be problematic under TRI; waste treatment facilities don't manufacture, and calling them processors "would probably be a stretch," the EPA says. But, of course (and this is the beauty of regulation), the EPA may decide that the facilities are "otherwise using" wastes.

Scrap metal recyclers and other generators of industrial wastes would be deterred from recycling their waste if they became subject to TRI. For instance, scrap recyclers commonly recycle copper and zinc. In some forms, copper and zinc can be harmful (for instance, if they are emitted into water[168]), but not if they are recycled from scrap metal. After all, scrap recyclers don't do anything to their materials chemically—they just change its shape. But copper and zinc have to be listed as chemical releases under the TRI. TRI reports would give people the impression that scrap recyclers are heavy polluters because of the amounts of metals they accept—even though their releases are minimal.

Also, since waste management facilities don't generate their wastes—they just process wastes that came from someplace else—they often have little information on what's in the wastes they accept. Adding waste management facilities to the TRI list would impose costly bookkeeping burdens on industry without providing anyone with good information.[169]

V. IT'S A CLEANUP PLAN! IT'S A LIABILITY SCHEME! IT'S SUPERFUND!

And it gets worse. Many recyclers can also be drawn into Superfund liability if their product is considered a hazardous substance under Superfund. Superfund provides for the cleanup of sites contaminated by hazardous substances, and allocates financial responsibility among potentially responsible parties.

All RCRA hazardous wastes are considered Superfund hazardous substances.[170] This is a problem for battery recyclers, for instance, who collect and sell spent lead acid batteries to secondary lead smelters. Some of these smelters are on the Superfund National Priority List of contaminated sites considered to present imminent threats to public health. Under Superfund, anyone even peripherally responsible for any portion of the material at a Superfund site can be held financially responsible for the entire cleanup. This arrangement is known as "joint and several liability."[171] This includes the current owner of the site, the owner at the time the contamination took place, the transporters of the waste, and the generators of the waste if they arranged for its treatment or disposal at the site.[172] But Superfund doesn't say what "arranging for treatment or disposal" means. In fact, the words "treatment" and "disposal" aren't defined in Superfund. The definitional section of the law refers to RCRA for the definitions, and RCRA only defines the terms with respect to "solid waste," which is itself defined as "any discarded material."[173] And so the courts have assumed that anyone sending a solid waste to the site must have been arranging for its disposal.[174]

Superfund liability can happen even if the site was put onto the National Priority List because of a completely different substance. For instance, the site could have been listed because of, say, radioactive thorium, but because secondary lead is a RCRA hazardous waste and happens to be located on the site, the recycler has to pay to clean up the property of the smelter he sold his used batteries to. Scrap dealers, who bring some used batteries to recycling plants, can also be held liable, but since they tend to have little net worth, their share of the liability is picked up by other parties. In cases where defunct battery recycling plants have become Superfund sites, major battery manufacturers—GNB, Johnson Controls, Delco—have often become liable for cleanup. The biggest collectors of spent batteries are mass merchandisers, like Sears, K-mart, and Walmart; J.C. Penney hasn't been in the automotive business for about ten years, but it has been named as a potentially responsible party at some Superfund sites in Virginia and North Carolina.[175]

Is selling something in fact arranging for its disposal? In general, no; the courts have specifically held that when something is sold that contains a hazardous waste, that's not enough to constitute "disposal."[176] But since materials in the recycling process are considered "solid waste," it is. Moreover, recyclers can't slough their liability onto anyone higher up in the production chain (for example, the original manufacturer). The buck stops with them.[177] The EPA, by rule,[178] has included all recycled scrap metal in the category of discarded material (solid waste), and pursues in litigation any recycler who has sold recycled metal to a customer who has (through his own activities) contaminated his own land.[179] The EPA doesn't pursue people who sold comparable virgin materials to the same site owner because these are not "solid wastes," and so no intent to dispose is presumed.[180]

If it were only RCRA hazardous wastes that ran into this problem, it might not be so bad. But there are other ways to qualify for Superfund liability. Metals like chromium, nickel, zinc, and copper are not RCRA hazardous wastes. But they are considered hazardous substances under Superfund, because the Clean Water Act limits the concentrations in which they can be discharged into water.[181] Stainless steel, for instance, is 18 percent chromium and 12 percent nickel, so a shipment of stainless steel is a Superfund hazardous substance, and the steel recycler, too, would become liable for the cleanup of the site to which he delivered the metal if it ever becomes a Superfund site.[182] Of course, if the stainless steel were an actual hazard to human health, one could make a case that Superfund liability was warranted. But the hazard involved is quite speculative (when the phenols in cough drops and the saccharine in sweeteners are hazardous substances under Superfund, and when there is no *de minimis* amount of a hazardous substance below which a mixture of materials is considered exempt,[183] something strange is afoot). If one were to take the steel, dissolve it in acid, and throw it in a trout stream, the trout would, indeed, die of poisoning; this is why the Clean Water Act dealt with it in the first place. Steel recyclers, incidentally, do not typically do this with steel that they are interested in recycling.[184] Under

normal circumstances, if one threw an untreated piece of stainless steel—what most people eat their lunch and dinner off of—in the water, nothing would happen.

This unusual form of Superfund liability—being drawn into "responsible party" status at Superfund sites where one's only connection is through the sale of a recycled product, is potentially a great threat to the recycling industry.[185] Lead battery recycling existed before RCRA and Superfund, but consider the case of rechargeable nickel-cadmium batteries. They aren't being recycled much today, and a lot of the reason is that their market just isn't very big, so it's hard to get them in large enough quantities to make recycling worthwhile. And yet, a number of states—including Maryland, New Jersey, Minnesota, Vermont, and Maine—now require manufacturers to set up nickel-cadmium battery collection programs. Since nickel-cadmium batteries are considered hazardous wastes and come with possible Superfund liability attached, these manufacturers are having a hard time getting retailers and distributors to participate in their programs.[186]

This Superfund problem affects metal recyclers the most, but some plastics, like PVC (polyvinyl chloride), as well as some glass, also contain enough lead for Superfund liability to potentially become a problem. Five parts per million of leachable lead is enough to trigger Superfund liability.[187] For instance, the Eastern Diversified Metals site in Hometown, Penn., became a Superfund site because of PVC insulation containing lead and other "hazardous substances." RCRA regulations and the specter of Superfund liability—which do not apply to virgin material manufacturers—are heavy burdens to bear. To call recyclable materials "wastes," and to consider their sale "arranging for disposal," clearly does not advance the goal of increased recycling.

VI. SUGGESTIONS FOR REFORM

Superfund should be amended so that recycling is not considered "treatment or disposal." In 1994, the Superfund Recycling Equity Act (H.R.3800, S.1834) was going to do just that, but it never came to a vote in the 103rd Congress.[188] A similar bill, the Superfund Recycling Equity Act of 1995 (H.R. 820), was introduced in the 104th Congress by Rep. Blanche Lambert-Lincoln (D-AR), but hasn't been acted on so far.[189] Superfund should also be changed so that cleanup liability is restricted to the parties responsible for those materials that triggered the listing of the site under Superfund in the first place.

Many of RCRA's recycling ills are inherent in the regulatory scheme. RCRA is billed as a piece of legislation that controls wastes "cradle-to-grave." But the term "cradle-to-grave" suggests a false sense of completeness. Instead, we should say that RCRA follows *products* from *death* to grave. Before they're thrown out, products have to abide by every other environmental law. After they are thrown out, they still have to abide by the same laws, plus RCRA. The imbalance is obvious. If products are more heavily regulated after they are thrown out, why should it surprise us that people prefer to use virgin materials rather than recycle? Conversely, if RCRA regulation depends not on actual environmental risks but on the "wastelike" nature of the product, why should it surprise us that RCRA "protects" us against so many insignificant threats? A system based *solely* on *realistic risks of actual harms* will do more to help human health and the environment, and won't unduly discourage recycling.

Suppose, though, that we're stuck with RCRA. Then, at the very least, RCRA should be amended to only deal with materials that are not destined for recycling, with the definition of "recycling" carefully chosen to encourage safe recycling while discouraging "sham" recycling.

There are a number of ways of doing this. The Japanese, for instance, define waste to exclude recovered materials.[190] The Paper Recycling Coalition has come up with a similar alternative definition of waste. "Recovered materials," in turn, are "materials and byproducts which have known recycling potential, and which have been removed or diverted from solid waste, or which have never been discarded as solid waste and are intended for sale, use, reuse, or recycling, whether or not such materials require subsequent separation and processing."[191]

The Institute of Scrap Recycling Industries proposes the following eight "indicia" to distinguish between actual recycling and "sham" recycling:

- Recycling is a process by which secondary material is *used to make a new product*.
- Recycling produces a *specification grade feedstock.*

- Recycled material *competes with virgin material.*
- The production of the specification grade feedstock incorporates a *substantial amount* of the input material.
- A recycling transaction must be economically justified based on evidence of a *market* for the product produced.
- The specification grade feedstock produced contains elements necessary [to] the new product and does not intentionally include extraneous material.
- *Burning* of material, even for the recovery of energy, *is not recycling.*
- *Use* of material in a manner *constituting disposal is not recycling.*[192]

These indicia aren't perfect. First, there's no particular reason the production of the feedstock should use a "substantial amount" of the input material; as noted above, cement kilns use aluminum potliner as fuel to replace 2 to 5 percent of their coal. This isn't a lot compared to the amount of coal, but it is a lot compared to the amount of potliner. Even reuse of a material in small amounts is legitimate reuse of materials that would otherwise be discarded.

Second, there needn't be evidence of a "market" for a recycling transaction to be economically justified. If I give a potential recycler my waste, or even pay a recycler to take it away, this can still be an economically justified transaction if it lets me avoid higher disposal costs. If I pay someone to take something, it's technically still a market (the economic literature refers to such markets as "negative markets"). Plus, requiring the existence of a market only protects existing recycling. To encourage new recycling, one certainly doesn't want to limit people to areas where markets already exists; that would be as pointless as requiring entrepreneurs to prove that they can sell their products *before* they set up shop.

Third, burning for energy recovery is a perfectly good use of materials, since it displaces virgin feedstock (in this case, energy). This, incidentally, is not the view of the Justice Department, which recently argued to an appellate court that a shale processor which had incinerated hazardous waste wasn't actually recycling it because the processor wasn't making it into a product.[193] On one level, this is a debate over terminology—burning things for energy recovery isn't usually thought of as "recycling," even though it may be a legitimate practice in its own right. But as noted before, we're not trying to define "recycling" merely for the sake of semantic correctness; there's a whole regulatory scheme riding on the definition. Given that the law unfairly penalizes burning for energy recovery because it's not recycling, we may want to define energy recovery as recycling anyway, if only for the sake of keeping all alternatives to disposal in the same category.

And finally, "use constituting disposal" can also be a legitimate form of recycling. For instance, using rubber chips made from scrap tires as daily cover for landfills would save landfill operators from having to buy, say, soil from elsewhere to put into the landfill, and would conserve landfill space.

But all of these examples show that there are ways of drawing distinctions between that which is recycling and that which isn't.

Once one has defined "recycling," how does one then avoid discouraging it? One approach would be to broaden the exemptions to RCRA, for instance by expanding § 3014, which deals with used oil.[194] Another approach would be to redesign the whole "all or nothing" regulatory structure of RCRA. California, for instance, explicitly exempts recycling and the onsite use of hazardous wastes, and issues permits for offsite recycling, with the regulatory burden decreasing for less hazardous substances. But since, even in California, handlers of hazardous waste have to conform to RCRA, the California regulations don't have as much effect as they could.[195]

Still another approach would be to establish a new subtitle to RCRA for recyclable materials. One proposal calls for "Subtitle K" regulations for using "hazardous reclaimable materials," which would include special permitting requirements to assure the safe operation of hazardous waste recycling facilities.[196] Another proposal would exempt all recyclable materials from Subtitle C unless they have no economic value or are consciously disposed of despite their value.[197]

Finally, RCRA could be amended to prevent industrial feedstocks from being identified as hazardous waste.[198] Industry already uses hazardous materials, and they don't come under RCRA until they are discarded.

Of course, any loosening of RCRA requirements may increase environmental risks. The increase will probably be tiny, given that RCRA already isn't allowed to use environmental harm as the basis for regulation. Moreover, any increase in risk has to be balanced against the corresponding increase in recycling. There are already environmental safeguards in place under existing environmental laws—governing *both* new manufacturing and recycling activities—to protect human health and the environment and to parcel out liability for their misuse. And, unlike RCRA, these laws have the advantage of not discriminating against recycling.

ABOUT THE AUTHOR

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[1] This paper is indebted, more than footnotes can indicate, to the following articles:
- Jeffrey M. Gaba, "Solid Waste and Recycled Materials under RCRA: Separating Chaff from Wheat," 16 *Ecology Law Quarterly* 623 (1989);
- J. Thomas Wolfe, "Realistic Recycling," *Federal Bar News & Journal*, February 1990;
- David J. Bodney and Steven M. Hoffman, "Rethinking the Law: A Balanced Approach to Recycling," *Arizona Attorney*, October 1993.

Acknowledgments also to Booker W. Morey, *The Role of Recycling in Hazardous Waste Management*, SRI Project 2030 (Menlo Park, Calif.: SRI International, March 1992), a paper I wish I had read *before* starting to write.

[2] Morey, *The Role of Recycling*, Figure 1, p. 8.

[3] 42 U.S.C. § 6901 *et seq.*

[4] The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Pub. L. No. 96-510, 94 Stat. 2767 (1980), 42 U.S.C. § 9601 *et seq.*

[5] Gaba, "Solid Waste and Recycled Materials," p. 625.

[6] 42 U.S.C. §§ 6903 (1982 & Supp. IV 1986).

[7] 40 C.F.R. § 261.31.

[8] 40 C.F.R. § 261.32.

[9] 40 C.F.R. § 261.33.

[10] Bodney and Hoffman, "Rethinking the Law," p. 13.

[11] Hazardous Waste Management System; Definition of Solid Waste, 50 Fed. Reg. 614 (Jan. 4, 1985) ("Original Definition"), p. 617.

[12] *Rethinking the Definition of Solid Waste* (EPA Forum Agenda, April 28, 1993), p. 8.

[13] 40 C.F.R. § 261.2(a)(2)(i) (1988). "The term `hazardous waste'... includes any *solid, liquid, semi-solid, or contained gaseous* waste materials...." James E. McCarthy and Mark E. Anthony Reisch, *Hazardous Waste Fact Book*, Congressional Research Service, January 30, 1987, p. CRS-1 (emphasis added).

[14] *Rethinking*, p. 13.

[15] *The Nation's Hazardous Waste Management Program at a Crossroads: The RCRA Implementation Study*, U.S. EPA, July 1990, EPA/530-SW-90-069, p. 38.

[16] "Industry tells `real world effects' of hazardous waste regulations," *Hazardous Waste News*, vol. 1, no. 2, January 30, 1995.

[17] Quoted in *United States v. White*, 766 F. Supp. 873, p. 880 (E.D. Wash. 1991).

[18] *United States v. White*, p. 882.

[19] 40 C.F.R. § 260, App. I (1992), pp. 23-26.

[20] Bodney and Hoffman, "Rethinking the Law," p. 13.

[21] 40 C.F.R. § 261.3(c) and (d).

[22] 40 C.F.R. § 261.3(a)(2)(iii).

[23] The "derived from" and "mixture" rules are key players in the cement kiln dust controversy. See "EPA decides to adopt tailored standards for cement kiln dust under RCRA Subtitle C," *BNA Chemical Regulation Daily*, February 3, 1995.

[24] "RCRA: EPA Agrees To Finalize `Mixture,' `Derived-From' Rules by Late 1996," *Solid Waste Report*, November 24, 1994, p. 376.

[25] "Court approves deadlines for hazardous waste rulemaking," *BNA National Environment Daily*, May 17, 1995.

[26] Personal communication, RCRA Hotline.

[27] "Specialty producers urge EPA to rethink new rules," *Chemical Marketing Reporter*, vol. 247, no. 11, March 13, 1995, p. 16. See also "Hazardous waste: Court deadlines driving RCRA regulatory program," *BNA Chemical Regulation Daily*, January 9, 1995. See also Gerald Karey, "Regulation & the Environment," *Platt's Oilgram News*, vol. 73, no. 15, January 23, 1995, p. 3.

[28] For a good discussion of how RCRA doesn't focus on the greatest risks to human health, see Jonathan H. Adler, *Hazardous Waste Regulation in South Carolina*, South Carolina Policy Council Education Foundation, 1993.

[29] McCarthy and Reisch, *Hazardous Waste Fact Book*, p. CRS-59.

[30] See *Unfinished Business: A Comparative Assessment of Environmental Problems*, overview report (Washington, D.C.: Environmental Protection Agency, Office of Policy Analysis, February 1987). See also Marc K. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions* (New York: Oxford University Press, 1990).

[31] Roger C. Dower, "Hazardous Wastes," *Public Policies for Environmental Protection*, Paul Portney, ed. (Washington, D.C.: Resources for the Future, 1990), p. 178.

[32] Universities Associated for Research and Education in Pathology, *Health Aspects of the Disposal of Waste Chemicals*, February 1985, p. ii.

[33] Elizabeth Whelan of the American Council on Science and Health, quoted in William Tucker, "Superfund Sparks Industrial Flight," *Insight*, November 29, 1993, p. 10.

[34] George L. Carlo, James Baller, and Kelly G. Sund, "New Science in Risk Assessments: Adapting to the Reforms," *Environmental Claims Journal*, vol. 3, no. 3, Spring 1991, p. 369. See also Thompson and Baur, "Improved Scientific Capabilities and the Management of Environmental Risk," 89 *Toxics Law Reporter* 1532. See also Nichols and Zeckhauser, "The Perils of Prudence," *Regulation*, Nov.-Dec. 1988, p. 14. See also National Academy of Sciences, *Risk Assessment in the Federal Government: Managing the Process* (Washington, D.C.: National Academy Press, 1983).

[35] *Crossroads*, p. 39.

[36] Report and Recommendations of the Technical Innovations and Economics Committee, Permitting and Compliance Policy: Barriers to U.S. Environmental Technological Innovation, EPA 101/N-91/001 ("NACEPT report").

[37] In 1985, the Congressional Budget Office wrote: "If the 1984 amendments to RCRA had not passed and no further changes to the law occurred before 1990, inflation-adjusted annual compliance costs would be expected to increase to $6.1 billion from the 1983 level of $5.8 billion, a 5 percent rise. But the land disposal prohibitions in the 1984 amendments will increase industrial compliance costs significantly, by requiring firms to employ more advanced treatment and disposal methods. In the absence of waste reduction, compliance costs could reach $11.2 billion (in 1983 dollars) in 1990, nearly double 1983 levels." U.S. Congress, Congressional Budget Office, *Hazardous Waste Management: Recent Changes and Policy Alternatives*, May 1985, p. 50. In addition, regulations governing land disposal were projected to cost industry an extra $2.6 to $5.4 billion a year. Ibid., p. 52.

[38] Environmental Protection Agency, *Environmental Investments: The Cost of a Clean Environment*, EPA Doc. #EPA-230-12-90-084 (Dec. 1990), p. 2-3. Estimated 1995 total annualized costs for RCRA—not just Subtitle C—were $32,468,000 in 1986 dollars, which is over $40 billion today. One study estimated that total cost would reach $203 billion to $265 billion by 2000 (and that probably underestimates the true amount), but these costs aren't discounted over time and so aren't particularly useful. *Cost of RCRA Corrective Action: Interim Report*, Waste Management Research and Education Institute, A Center of Excellence at The University of Tennessee, Knoxville, December 1991, p. 49.

[39] Regulations governing the land disposal of wastes can cost as much as $4.2 billion per death averted. Warren Brookes, "Wreaking Havoc with Waste Disposal," *Washington Times*, April 1, 1991, p. D1. The hazardous waste listing for certain wood preserving chemicals was estimated to cost over $5 trillion per death averted. *The Budget of the United States, FY 1992* (Washington, D.C.: Office of Management and Budget, 1991).

[40] *Crossroads*, pp. 27, 50, and 51.

[41] *Crossroads*, p. 50.

[42] U.S. Congress, Office of Technology Assessment, *Facing America's Trash: What Next for Municipal Solid Waste?*, OTA-O-424

(Washington, D.C.: U.S. Government Printing Office, October 1989), p. 159.

[43] Gaba, p. 626, n. 16. See also EPA Regulations on the Identification and Listing of Hazardous Wastes, 40 C.F.R. § 261.24 (1989).

[44] Judge Adrian Duplantier, quoted in a press release from Marine Shale Processors Inc., itself quoted in "Judge critical of both parties in Marine Shale case," *Pesticide & Toxic Chemical News*, September 7, 1994, p. 20.

[45] See the discussion of the *American Mining Congress* and *American Petroleum Institute* cases later in this paper.

[46] See Hazardous Waste Management System: General; Identification and Listing of Hazardous Waste; Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities; and Standards for the Management of Specific Wastes and Management Standards for Specific Types of Facilities, 48 Fed. Reg. 14,472 (Apr. 4, 1983) ("Proposed Standards"), p. 14,502.

[47] 40 C.F.R. § 261.6(a)(3) (1988).

[48] The rest of this paper deals with specific examples—secondary lead and spent aluminum potliner, for instance. "The grant of authority in RCRA over recycling activities is not unlimited. Specifically, we do not believe our authority extends to certain types of recycling activities that are shown to be very similar to normal production operations or to normal uses of commercial products." See Original Definition.

[49] 42 U.S.C. § 6921 (1982 & Supp. IV 1986).

[50] 42 U.S.C. § 6903(7).

[51] Proposed Standards, p. 14,502.

[52] 42 U.S.C. § 7401 *et seq.*

[53] Pub. L. No. 95-217, 33 U.S.C. § 1251 note, §§ 1254 *et seq.*, and § 1284 note.

[54] Pub. L. No. 91-596, 84 Stat. 1590 (1970), 29 U.S.C. § 651 *et seq.*

[55] 42 U.S.C. §§ 11001-11050 (Supp. IV 1986).

[56] 15 U.S.C. § 2601 *et seq.*

[57] Morey, *The Role of Recycling*, p. 29.

[58] Testimony of Dr. Herschel Cutler, executive director of the Institute of Scrap Recycling Industries, Inc., in *Development of Recycling Markets*, Hearings before the Subcommittee on Transportation and Hazardous Materials, Committee on Energy and Commerce, U.S. House of Representatives, June 13 and 19, 1991 (Washington: U.S. Government Printing Office, 1991), p. 285.

[59] See Ann M. Thayer, "Pollution Reduction," *C&EN*, March 16, 1992, p. 32.

[60] *Crossroads*, p. 103.

[61] Hazardous Waste Management System; Modification of the Hazardous Waste Recycling Regulatory Program, 58 Fed. Reg. 8102 (Feb. 11, 1993), p. 8104 ("Proposed Universal Wastes Rule"). See also *Rethinking*, p. 9.

[62] Gaba, "Solid Waste and Recycled Materials," p. 631.

[63] Original Definition.

[64] For example, spent aluminum potliner; see the discussion of potliner later in this paper. Shaun D. Peterson, *RCRA's Solid Waste Regulation and Its Impact On Resource Recovery In The Minerals Industry*, September 1990, U.S. Department of the Interior, Bureau of Mines, p. 3.

[65] 40 C.F.R. § 261.6(c)(1) (1988).

[66] 40 C.F.R. § 261.6(c)(2) (1988).

[67] "Section 261.6 contains the general requirements for recyclable materials. In addition to the basic substantive requirements, this section also exempts some wastes from any regulatory requirements and cross-references the requirements for certain other recyclable materials specified in Part 266. Part 266 contains the substantive requirements applicable to specific types of recycling including `Recyclable Materials Used in a Manner Constituting Disposal' and `Hazardous Waste Burned for Energy Recovery.' And you thought the worst was over." Gaba, "Solid Waste and Recycled Materials," pp. 644-645.

[68] Gaba, "Solid Waste and Recycled Materials," p. 646.

[69] Testimony of Winston Porter, deputy EPA administrator, in *Sham Recycling*, Hearing before the Subcommittee on Hazardous Wastes and Toxic Substances, Committee on Environment and Public Works, U.S. Senate, April 14, 1988 (Washington: U.S. Government

Printing Office, 1988), p. 8.

70 *Sham Recycling*, pp. 44-45.

71 40 C.F.R. § 268.40.

72 Morey, *The Role of Recycling*, pp. 12-13.

73 824 F. 2d 1177 (D.C. Cir. 1987) (AMC I).

74 AMC I, p. 1193. "To a significant extent, the AMC I decision was based on legislative history indicating that, in choosing the phrase `discarded material' to define the `solid waste' regulated by RCRA, Congress intentionally excluded recycled hazardous materials from RCRA regulation: `*Much industrial and agricultural waste is reclaimed or put to new use and is therefore not a part of the discarded materials disposal problem the committee addresses.*' H.R. Rep. No. 1491, 94th Cong. 2d Sess. 2 (1987), quoted with emphasis in AMC I, 824 F. 2d at 1192." Bodney, "Rethinking the Law," n. 18.

75 42 U.S.C. § 6935.

76 906 F. 2d 729 (D.C. Cir. 1990).

77 907 F. 2d 1179 (D.C. Cir. 1990) (AMC II).

78 See API, p. 741 (stating that AMC I applied only to materials "*destined for beneficial reuse or recycling in a continuous process by the generating industry itself*," quoting with emphasis AMC I at 1186).

79 See the Superfund section later on in this paper.

80 Morey, *The Role of Recycling*, p. 12.

81 Morey, *The Role of Recycling*, p. 15.

82 *Rethinking*, p. 18; Proposed Universal Wastes Rule, p. 8104.

83 Morey, *The Role of Recycling*, pp. 15-16.

84 NACEPT report.

85 *Rethinking*, p. 15.

86 *Hazardous Waste Management*, p. 10. See also Linda Greer, "Definition of Hazardous Waste," *Hazardous Waste*, vol. 1, no. 3, November 1984.

87 Morey, *The Role of Recycling*, Tables 1 and 2, pp. 18-20. R. Lee Byers, "Regulatory Barriers to Pollution Prevention," *Journal of the Air and Waste Management Association*, vol. 41, no. 4, April 1991, p. 418, Table 1.

88 Called "galena ore" by its friends.

89 Personal communication, Edward L. Puckett, general manager for resource recycling at GNB Inc.

90 Final Regulatory Determination for Special Wastes from Mineral Processing, 56 Fed. Reg. 27,300 (June 13, 1991).

91 40 C.F.R. § 261.4(b)(7). *See also* Regulatory Determination for Wastes from the Extraction and Beneficiation of Ores and Minerals, 51 Fed. Reg. 24,496 (July 3, 1986), in which the EPA declared that it wouldn't regulate mining wastes under Subtitle C. McCarthy and Reisch, *Hazardous Waste Fact Book*, p. CRS-18.

92 *Facing America's Trash*, p. 159.

93 40 C.F.R. § 261.2(c)(4).

94 To be codified at 40 C.F.R. § 261.2(e)(iii).

95 Testimony of Edward Puckett, in *Development of Recycling Markets*, p. 639.

96 40 C.F.R. § 261.6(a)(2)(iv), (3)(ii) and (3)(iv).

97 See *U.S. v. ILCO Inc.*, CA 11, No. 91-1004, August 4, 1993. "Lead reclaimed from spent batteries ruled hazardous," *Pesticide & Toxic Chemical News*, August 9, 1993, vol. 21, no. 41. "Lead recovered from spent batteries is hazardous waste, appeals court rules," *BNA National Environment Daily*, August 10, 1993. "Environment and Conservation," *United States Law Week*, August 31, 1993, 62 U.S.L.W. 2131.

98 Personal communication, Edward Puckett.

[99] 40 C.F.R. § 266.80(g).

[100] Personal communication, Edward Puckett.

[101] Personal communication, Edward Puckett.

[102] *Facing America's Trash*, p. 160.

[103] Personal communication, David Cook, marketing consultant, Lake Engineering.

[104] This and the following lead numbers come from Commodities Research Unit Ltd.

[105] The 80-percent figure is for North America (United States and Canada), where lead consumption by the battery industries was 1.204 million metric tons (1.001 million for automotive batteries and 0.203 million for industrial batteries), out of a total consumption of 1.502 million metric tons. Because the battery share of the Canadian lead market is similar to the U.S. share, North American percentages can be safely taken as representative of U.S. percentages. Personal communication, David Cook.

[106] Personal communication, Edward Puckett.

[107] That's from 23 U.S. aluminum smelters. "Aluminum," *Resource Recovery Report*, January 1994, p. 8. Total potliner production is down from 130,000 metric tons in 1989. Peterson, *RCRA's Solid Waste Regulation*, p. 7.

[108] Identification and Listing of Hazardous Waste; Amendments to Definition of Solid Waste, 53 Fed. Reg. 519 (Jan. 8, 1988).

[109] Hazardous Waste Management System; Identification and Listing of Hazardous Waste; and Designation, Reportable Quantities, and Notification, 53 Fed. Reg. 35,412 (September 13, 1988).

[110] U.S. EPA, Office of Solid Waste, Background Listing Document for Listing of Six Smelter Wastes, Primary Aluminum Reduction (waste-K088), Aug. 31, 1988 (docket No. F-88-SWRF-FFFFF).

[111] Personal communication, John Bennett, research economist, U.S. Department of the Interior, Bureau of Mines.

[112] "Managing Spent Potliner: A Report to Washington State Department of Ecology by Alcoa, Columbia, Intalco, Reynolds, Vanalco, and Kaiser Aluminum," 1989.

[113] Peterson, *RCRA's Solid Waste Regulation*, p. 8.

[114] $4.3 million in 1989, according to Peterson, *RCRA's Solid Waste Regulation*, pp. 7-8.

[115] Peterson, *RCRA's Solid Waste Regulation*, pp. 7–8.

[116] R.C. Dickie, "Spent Potliner as an Alternative Fuel in Cement Kilns," *J. Met.*, Nov. 1986, p. 35.

[117] Peterson, *RCRA's Solid Waste Regulation*, p. 9.

[118] Peterson, *RCRA's Solid Waste Regulation*, p. 8.

[119] Peterson, *RCRA's Solid Waste Regulation*, p. 7.

[120] The land disposal ban is a result of litigation with the Environmental Defense Fund.

[121] "Aluminum."

[122] Personal communication, Doug Macauley, Reynolds Metals.

[123] RCRA § 3014, added to RCRA by the Used Oil Recycling Act of 1980. This goal was reemphasized in the Hazardous and Solid Waste Amendments of 1984, with greater stress on protecting human health and the environment from the hazards of used oil.

[124] 45 Fed. Reg. 33,084 (May 19, 1980).

[125] Hazardous Waste Management System; General; Identification and Listing of Hazardous Waste; Used Oil, 50 Fed. Reg. 49,258 (Nov. 29, 1985).

[126] Identification and Listing of Hazardous Waste; Used Oil, 51 Fed. Reg. 41,900 (Nov. 19, 1986), p. 41,901.

[127] See figure following p. 11 in *Generation and Flow of Used Oil in the United States in 1988*, U.S. EPA, Office of Solid Waste, presented by Philip H. Voorhees of Temple, Barker & Sloane, Inc., at the Association of Petroleum Re-Refiners/Project Rose Conference, "Used Oil: Coming Full Circle," November 30, 1989. Approximately 60 percent of car owners change their own oil. *Used Oil Recycling in California: A Status Report for the 1988 Calendar Year*, California Waste Management Board, January 1990, p. 9.

[128] Testimony of the American Petroleum Institute, *Development of Recycling Markets*, p. 331.

[129] American Petroleum Institute, *Used Oil Management in Selected Industrialized Countries*, Discussion Paper #064, January 1991, p. vii, quoting *Used Oil Management in the United States in 1988*, Appendix 1. Congressman Ike Skelton's testimony gives a figure of 400 million gallons. *Development of Recycling Markets*, p. 13.

[130] Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Recycled Used Oil Management Standards, 57 Fed. Reg. 41,566 (Sept. 10, 1992) ("Management Standards"), section II (Background).

[131] 861 F. 2d 270 (D.C. Cir. 1988).

[132] 57 Fed. Reg. 21,524 (May 20, 1992). See also Management Standards, at II.B.

[133] Management Standards, at V.A.

[134] National Oil Recyclers Association, *Used Oil Management Standards: State-by-State Analysis*, November 1994, prepared by Harris & Johnson, Attorneys, Appendix B, p. 1.

[135] National Oil Recyclers Association, *Used Oil Management Standards*, Appendix B, p. 4.

[136] Management Standards, at VIII.A.

[137] National Oil Recyclers Association, *Used Oil Management Standards*, p. 18.

[138] National Oil Recyclers Association, *Used Oil Management Standards*, p. 21.

[139] Personal communication, Brad Jones, American Petroleum Institute.

[140] The National Oil Recyclers Association reports that New Hampshire lists used oil as a hazardous waste, but the American Petroleum Institute disagrees. Personal communication, Brad Jones. New Hampshire treats on-specification and off-specification used oil according to management standards. *See* New Hampshire regulations, part Env-Wm 807.04(a), which sets forth the conditions under which used oil is a hazardous waste: "Used oil shall be classified as a hazardous waste and shall be managed in accordance with the hazardous waste rules if it: (1) Has been mixed with hazardous waste; (2) Exhibits a hazardous waste characteristic, except as provided for in Env-Wm 807.02 or Env-Wm 807.03; or (3) Does not meet the standards for off-specification used oil specified in Env-Wm 807.03."

[141] National Oil Recyclers Association, *Used Oil Management Standards*, p. 15. The NORA document has "Maryland Department of Environmental Protection" where I have "Massachusetts Department of Environmental Protection"; I have assumed that this was their mistake.

[142] National Oil Recyclers Association, *Used Oil Management Standards*, p. 27.

[143] National Oil Recyclers Association, *Used Oil Management Standards*, p. 32.

[144] It has been noted that a nonhazardous waste listing might encourage recycling but also make recycling facilities less safe. If the used oil is unsafely handled by some fly-by-night recycler, are we any better off than if it had been dropped down a drain pipe? "Improper storage and handling of contaminated used oil can also result in serious contamination of groundwater supplies. EPA's Used Oil Background Document prepared for the 1986 rulemaking clearly documents 80 such contamination incidents, more than 40 of which are on the Superfund National Priorities List. These sites are <u>not</u> the result of do-it-yourself oil changers improperly disposing of their used motor oil. They are the legacy of unregulated `recycling' operations." Testimony of Jacqueline M. Warren, senior attorney at the Natural Resources Defense Council, *Development of Recycling Markets*, p. 370. This is true enough, and the reason for the tightening of the federal management standards was to get rid of the troublesome "schlock operations" of earlier days. Personal communication, Brad Jones.

[145] California Health and Safety Code §§ 25250 *et seq.*

[146] California Health and Safety Code §§25250 *et seq.* See "A Federal Listing of Used Oil as Hazardous is NOT Justified by the California Experience," American Petroleum Institute, p. 2. See also testimony of Peter Weiner in *Development of Recycling Markets*, p. 348.

[147] California Health and Safety Code § 25250.8.

[148] "A Federal Listing of Used Oil," p. 1.

[149] Testimony of Peter Weiner, *Development of Recycling Markets*, pp. 349-350.

[150] California Health and Safety Code §§ 25250.4 and 25250.24(a).

[151] California Health and Safety Code § 25250.23.

[152] Weiner testimony, p. 359. See also *Used Oil Recycling in California*, p. 9.

[153] Testimony of Ike Skelton, *Development of Recycling Markets*, p. 10.

[154] *Used Oil Recycling in California*, pp. 11-12.

[155] *Used Oil Recycling in California*, Figure 4 before p. 12.

[156] Eastern Oil, in the Washington, D.C. area, picks up used oil for free if the price of No. 4 virgin fuel oil is between 48 cents and 54 cents on the first day of the month. Eastern pays collection site operators 1 cent per gallon for each cent by which the price of virgin fuel exceeds 54 cents, and charges them 1 cent per gallon for each cent by which the price of virgin fuel is less than 48 cents. American Petroleum Institute, pp. 9 and 11.

[157] In California, about 137 million gallons of used automotive and industrial oils were generated and potentially available for recycling in 1988. *Used Oil Recycling in California*, p. 2 and the page between pp. 9 and 10. The report contains two tables, one between pages 7 and 8 and the second between pp. 9 and 10. The tables are identical, except that the first is riddled with silly mathematical errors in column 3. 62.6 million gallons of used oil were re-refined or reprocessed in California in 1988. Ibid., p. 3.

[158] The 46-percent California rate "is far better than the national average of 30 percent," exults *Used Oil Recycling in California*, p. 3. The report is mistaken, however, and so is Peter Weiner of Evergreen Oil, whose congressional testimony relies on this figure. See *Development of Recycling Markets*, p. 348. Nationwide, 770 million gallons of used oil entered the Used Oil Management System in 1988, out of a total quantity generated of 1,351 million gallons. See the figure following p. 11 in *Generation and Flow of Used Oil in the United States in 1988*. "The California report does not explain how it derived the national recycling rate of 30 percent," the National Oil Recyclers Association statement muses in *Development of Recycling Markets*, p. 403, but guesses, probably correctly, that the error came from dividing by 2,400 million gallons—the total quantity of oil sold, according to *Used Oil Recycling in California*, table between pp. 9 and 10—rather than by 1,351 million gallons— the total quantity of used oil generated. The quantity of oil entering the Used Oil Management System has been 57 percent of the total quantity of oil sold since 1983. *Generation and Flow of Used Oil*, p. 6.

[159] About 130 million gallons of used oil and industrial oil were generated and available for recycling in California from October 1992 to September 1993. For the same period, 74 million gallons of used oil were collected and recycled, or used as fuel. California Integrated Waste Management Board, *1993 Annual Report*, p. 46.

[160] 814 million gallons of used oil entered the Used Oil Management System in 1991, out of 1,378 million gallons of used oil generated. Philip H. Voorhees, *Perspectives on the Generation and Management of Used Oil in the U.S. in 1991*, presented at the 1992 National Oil Recyclers Association annual meeting, November 5, 1992, Scottsdale, Arizona, Exhibit 1, p. 3.

[161] Personal communication, Chris Styan, Weyerhaeuser.

[162] Personal communication, Frank Vincent, James River.

[163] "EPA to streamline process for authorizing state RCRA programs," *Inside EPA's RCRA Report*, June 16, 1995, vol. 1, no. 1, p. 5.

[164] 42 U.S.C. §§ 11023 and 11048.

[165] 42 U.S.C. § 11001 *et seq.*, codified at 40 C.F.R. §§ 355-372. EPCRA is the common name for the Superfund Amendments and Reauthorization Act (SARA), Title 3.

[166] Standard Industrial Classification 20 through 39. By Executive Order, federal facilities are also subject to the TRI.

[167] Personal communication, RCRA Hotline.

[168] See Superfund section later in this paper.

[169] "Adding Waste Facilities to Toxics List Could Hurt Recycling, Increase Costs," *Solid Waste Report*, June 1, 1995, vol. 26, no. 22, p. 177.

[170] The complete set of ways to become a Superfund hazardous substance is set forth in 42 U.S.C. § 9601 (14). A substance is considered hazardous under Superfund if it qualifies under certain provisions of the Clean Water Act, the Safe Drinking Water Act (42 U.S.C. § 300), RCRA, the Clean Air Act, or the Toxic Substances Control Act. A substance can also be specially listed as hazardous under Superfund.

[171] Kent Jeffreys, "Reinventing Superfund: The Clinton Reform Proposal and an Alternative" (Competitive Enterprise Institute, June 1994), p. 6.

[172] CERCLA § 107(a)(3).

[173] "Superfund & Recycling," Institute of Scrap Recycling Industries, Inc.

[174] In *United States v. A&F Materials Co.*, 582 F. Supp. 842 (S.D. Ill. 1984), defendant contended that the sale of material which was "wastelike" was not arrangement for disposal. He lost. Similarly, in *United States v. Conservation Chemical Co.*, 619 F. Supp. 162 (W.D. Mo. 1985), the court held the sale of a wastelike hazardous substance for use in treating the waste of other generators was arranging for disposal for the purposes of § 107(3) of CERCLA. See also *United States v. Shaner et al.* (E.D. Pa., Civil Action No. 85-1372).

[175] Personal communication, Edward Puckett and Ned Ferguson.

[176] *United States v. Westinghouse*, 22 E.R.C. 1230 (S.D. Ind. 1983), and in *Florida Power and Light Co. v. Allis-Chalmers Corp.*, 29 E.R.C. 1486 (S.D. Fla. 1988).

[177] Personal communication, Thomas Wolfe, Institute of Scrap Recycling Industries.

[178] 40 C.F.R. § 261.1.

[179] See *United States v. Pesses* (W.D. Pa., Civil Action No. 90-0654), brief amicus curiae of the Institute of Scrap Recycling Industries in support of Defendants' motions for summary judgment.

[180] See "Superfund & Recycling."

[181] Clean Water Act, § 1321(b)(2).

[182] See *United States v. Pesses*.

[183] "Superfund & Recycling."

[184] This process is used, though, in steel manufacture, and the spent acid solution containing dissolved steel is called "spent pickle liquor."

[185] Wolfe, "Realistic Recycling."

[186] Personal communication, Ned Ferguson.

[187] Personal communication, Thomas Wolfe.

[188] Patrick McCreery, "Recyclers To Get Superfund Relief; Support from Paper Industry Grows," *Recycling Times*, August 23, 1994, p. 12.

[189] "House bill would lift CERCLA liability for recyclers," *Pesticide & Toxic Chemical News*, February 15, 1995, vol. 23, no. 16.

[190] Howard Levenson and Kathryn D. Wagner, "Japan Manages Waste—*Their* Way," *Waste Age*, November 1990, p. 168.

[191] See the statement of the Paper Recycling Coalition in *Development of Recycling Markets*, p. 480.

[192] "Indicia of Bonafide Recycling," Institute *of* Scrap Recycling Industries, Inc. (gratuitous emphasis in original).

[193] This is the argument of the government's appeal in the case of *U.S. v. Marine Shale Processors* (94-30149). "Appeals filed in two marine shale cases," *Pesticide & Toxic Chemical News*, vol. 23, no. 19, March 8, 1995.

[194] Morey, *The Role of Recycling*, p. 27.

[195] Sham Recycling Senate Hearing 100-63, hearing before Subcommittee on Hazardous and Toxic Substances of the Committee on Environmental and Public Works, April 14, 1988. Quoted in Morey, *The Role of Recycling*, p. 27. Recently, the state of California proposed excluding certain recyclable materials from the California "use constituting disposal" prohibition. "Recyclable Materials Disposal," *Inside Cal/EPA*, February 17, 1995, p. 5.

[196] "Proposed Amendments to the Solid Waste Disposal Act to Provide for the Regulation of Industrial Recycling," The Business Recycling Coalition, U.S. Chamber of Commerce, 1991. Quoted in Morey, *The Role of Recycling*, p. 28.

[197] National Environmental Development Association, RCRA Project, Washington, D.C., 1991. Quoted in Morey, *The Role of Recycling*, p. 28.

[198] Morey, *The Role of Recycling*, p. 29.