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Industrial Waste: Saving the Worst for Last?

John C. Dernbach

Editors' Summary: RCRA reauthorization bills are currently moving through Congress. While RCRA Subtitle C provisions, addressing hazardous waste, continue to garner the lion's share of legislative attention, the author examines why Subtitle D provisions, dealing with solid waste, must be given greater attention and regulatory oversight. Specifically, the author focuses on industrial waste, which may represent as much as 94 percent of municipal, hazardous, and industrial wastes combined. The author explores the existing federal framework for industrial waste and looks at innovative state approaches. He analyzes current House and Senate RCRA reauthorization bills and how they could be written to best address four program goals: energy and materials conservation; environmental protection at waste management facilities; prompt and significant results; and genuine state and federal partnerships. The author concludes with suggestions for RCRA programs that could be used to implement these goals.

Mr. Dernbach is the Special Assistant to the Director, Bureau of Waste Management, Pennsylvania Department of Environmental Resources (DER). The views expressed in this Article are the author's and not necessarily those of DER. Many friends and colleagues contributed ideas to this Article. The author is especially grateful to Linda Greer, Ann Maest, Keith Welks, and Marcia Williams, who provided helpful comments. This Article is adapted from a paper given on March 8, 1990, to an Office of Technology Assessment workshop on nonhazardous industrial waste.

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Over the past two decades, Congress has enacted many environmental protection laws aimed at attacking part of a problem while other parts were left virtually unnoticed and unregulated. This approach was often justified as a way of managing priorities or as a response to incomplete information. Then, after the initial attack enjoyed some success, the neglected problems came into view and often turned out to be more significant than originally believed. The increased attention currently being given to sources of nonpoint water pollution and carbon dioxide in the atmosphere are prime examples.

The Resource Conservation and Recovery Act (RCRA)¹ was enacted in 1976 to address the land-based disposal of hazardous and solid wastes and to structure the development and implementation of federal and state regulatory programs for those wastes. Subtitle C addressed hazardous waste, while Subtitle D addressed the management of all solid waste disposal, including discarded household wastes, garbage, other municipal wastes, industrial wastes, mining wastes, oil and gas wastes, and sludges from waste treatment plants and pollution control facilities. Beginning with the news of Love Canal in 1978, the regulation of hazardous waste under Subtitle C has been given extraordinary attention. Now, with RCRA reauthorization pending, Congress is beginning to focus on what should be done to amend Subtitle D.

There exists a widespread perception that Subtitle D, or nonhazardous waste, is mostly municipal waste. This perception is reinforced by news reports highlighting disposal capacity, ash barges, recycling, and the anticipated publication of EPA's final municipal waste regulations.² However, this perception is wrong. Between hazardous waste and municipal waste is a kind of waste that is generated in vastly greater volumes than the other two combined — nonhazardous industrial waste, or simply industrial waste.³

The Problem

The magnitude of the industrial waste problem is overwhelming when stated in figures. Nationally, about 211 million tons of municipal waste⁴ and approximately 300 **[20 ELR 10284]** million tons of hazardous waste⁵ are generated annually. These numbers seem small compared with the 7,600 million tons of industrial waste that are generated and disposed of on-site annually.⁶ Industrial waste is generated in amounts that are 36 times larger than municipal waste, and 25 times larger than hazardous waste. Industrial waste may represent as much as 94 percent of municipal, hazardous, and industrial wastes combined.⁷

These statistics both understate and overstate the size of the problem. On one hand, the data do not include disposal away from the site where the waste was generated, which is the fate of much industrial waste.⁸ On the other hand, 96.6 percent of industrial waste goes to impoundments (ponds or lagoons) for storage, treatment, or disposal.⁹ Not all wastes that go to industrial impoundments are ultimately disposed there, since 29 percent of these impoundments have discharge permits.¹⁰ Much of the industrial waste stream is discharged into surface waters after treatment or storage in impoundments under the Federal Water Pollution Control Act's (FWPCA) National Pollution Discharge Elimination System (NPDES) program.¹¹ Moreover, evaporation at waste water treatment or storage impoundments reduces the industrial waste stream.

It is not clear, however, that surface discharges and evaporation significantly reduce the magnitude of the problem. Liquid wastes have a greater ability than comparable solid wastes to leach into the ground and groundwater, even if these liquid wastes are not intended to be disposed of in the impoundments. The potential magnitude of groundwater pollution from some of these impoundments is not necessarily diminished by the fact that the polluting constituents they contain can be measured only in parts per million or parts per billion. Additionally, treatment and storage ponds or lagoons have become disposal impoundments because they are filled over time and then abandoned or closed.

Industrial waste also dominates municipal and hazardous waste streams in Pennsylvania. While nine million tons of municipal waste and 0.8 million tons of hazardous waste are generated annually, an estimated 16 million tons of industrial waste are generated annually, or 62 percent of the total.¹² The 16-million-ton figure generally excludes industrial waste at treatment, storage, and disposal impoundments, and probably underestimates the amount of industrial waste generated and disposed of in solid form. As a result, industrial waste probably constitutes a higher percentage of the total waste stream in Pennsylvania.

Every year in the United States, the greatest industrial waste volumes are generated by the following industries: pulp and paper (2,252 million tons); electric power generation (1,092 million tons); primary iron and steel (1,301 million tons); and inorganic chemicals (920 million tons).¹³ In Pennsylvania, bottom ash, fly ash, and flue gas desulfurization residue from coal-burning power plants may constitute 40 percent or more of all industrial waste generated annually. Significant volumes are also generated by the following industry groupings: paper mills and products; stone, clay, and concrete products; and food processing. Other wastes include metallurgical process waste (e.g., foundry sand), sludges and scales, asbestos waste, chemical wastes, polychlorinated biphenyl (PCB)-containing wastes, industrial scraps and equipment,¹⁴ plating and pickling wastes, slaughterhouse wastes, canning wastes, cooling and processing water, and storm water runoff.¹⁵

The United States Environmental Protection Agency (EPA) has concluded that "industrial Subtitle D facilities are a cause for concern."¹⁶ Some 28,000 Subtitle D industrial waste landfills, surface impoundments, land application **[20 ELR 10285]** units, and waste piles are currently active. About 15,000 of these are classified as impoundments.¹⁷ EPA found that less than five percent of the industrial waste impoundments had a synthetic liner system, that only 17.4 percent had some kind of natural liner (e.g., clay), and that only 8.6 percent had any groundwater monitoring.¹⁸ Significantly, 416 of the 1,396 impoundments with groundwater monitoring showed groundwater contamination.¹⁹ A 1980 surface impoundment study in Pennsylvania concluded that the majority of documented groundwater pollution events from impoundments involved industrial impoundments, that 84 percent of the polluting impoundments were unlined, and that industrial impoundments pose a particular threat to groundwater and water supplies because they are usually located in densely populated areas.²⁰ Industrial waste landfills present similar concerns. EPA found that only 1.3 percent had synthetic liners, with natural liners at only 11.2 percent. Only 3.2 percent had leachate collection systems, about one-third had run-on/run-off controls, and only 34.2 percent had restrictions on the receipt of liquid

wastes.²¹

Industrial wastes have caused or contributed to significant problems at many sites in Pennsylvania, some of which have been designated for cleanup under state or federal Superfund programs. At Palmerton in Carbon County, Pennsylvania, a 2.5-mile-long waste mountain of smelting slag containing zinc, cadmium, and other heavy metals has contaminated surface water and groundwater and has defoliated large areas of adjacent land. At the Ambler asbestos site in Montgomery County, Pennsylvania, airborne asbestos from piles of magnesium, calcium carbonate, and asbestos wastes presents a health threat to nearby residents and a public playground. PCB-contaminated wastes threaten groundwater at numerous locations on Texas Eastern Pipeline Company's pipeline routes.²² Pennsylvania's Department of Environmental Resources (DER) estimates that there may be as many as 1,000 unpermitted industrial waste disposal facilities in the state.²³ In addition, many old industrial waste sites have not been investigated for possible inclusion on the National Priorities List under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).²⁴

Industrial wastes present a range of environmental and public health risks. Industrial waste, as previously noted, includes significant amounts of food processing wastes (e.g., fruit and vegetable residues), and bricks, gypsum board, and other debris from the construction or demolition of industrial facilities. In general, these wastes present relatively small risks to the environment or public health. Moreover, the potential harmfulness of industrial waste varies within industrial groupings. However, even if only one-tenth of this waste presented significant environmental or public health risks, it would still be greater than municipal and hazardous waste combined.

Existing Federal Framework

Industrial waste is not recognized as a serious problem under federal law. EPA's statutory authority for hazardous waste is comprehensive and ever tightening.²⁵ Treatment, storage, and disposal facilities for hazardous wastes are subject to stringent permitting and operational regulations, and the land disposal of many hazardous wastes is being phased out. Hazardous waste cannot be transported without a license, and loads must be accompanied by a manifest to ensure that the waste arrives at a permitted facility. Waste that does not meet the legal definition of "hazardous," however, is subject only to EPA's open-dump criteria. These criteria apply to only a limited number of waste disposal problems, address many of these problems rather vaguely, and do not apply to treatment, storage, or transportation.²⁶ RCRA does not expressly require that nonhazardous waste treatment, storage, and disposal facilities be permitted. Generally, Subtitle D treats all nonhazardous waste the same and only includes specific provisions for municipal waste, household hazardous waste, small-quantity generator hazardous waste, and recycled oil. Industrial waste is not given separate attention. The disparity in regulatory control between hazardous and nonhazardous waste is so great that delisting of a hazardous waste means virtual federal regulatory abandonment.²⁷

The sharp decline in regulatory control over nonhazardous waste is inappropriate because of the environmental and public health risks posed by industrial waste. The legal definition of hazardous waste is narrower than what is actually hazardous, since some industrial waste poses substantial public health or environmental risks. The public's understanding of hazardous waste probably corresponds to the congressional definition of that term. RCRA defines hazardous waste as waste that alone or in combination with other wastes may (1) cause or contribute to an increase in mortality or serious or incapacitating illness or (2) pose a substantial present or potential hazard to human health or the environment when improperly managed.²⁸ Americans who answer public opinion polls about hazardous waste no doubt have a similar definition in mind.

Because translating this broad definition into a workable program was difficult, the regulatory definition is much more limited in scope.²⁹ A waste may be legally hazardous [20 ELR 10286] because it is listed as such, or because it has ignitable, reactive, corrosive, or toxic characteristics. However, such listings do not clearly define a boundary separating waste that is hazardous from waste that is not hazardous. The risks posed by various wastes run along a continuum, since the actual hazard presented by a waste depends on the concentration of dangerous constituents in the waste, the volume of the waste, the manner in which it is placed in the environment, and other factors. Thus, the black and white universe defined by RCRA is at odds with reality.

The risk continuum can be seen in many ways. First, application of the extraction procedure (EP) toxicity test can bring wastes into the hazardous category based on an analysis of only 14 constituents. When this test is replaced by the

toxicity characteristic leaching procedure (TCLP), the number of regulated constituents will increase by 25 constituents to a total of 39.³⁰ However, the number of potentially dangerous constituents in wastes is in the thousands.³¹ Neither test is therefore particularly definitive in identifying which wastes are truly hazardous, although the listing of specific hazardous wastes compensates for this deficiency to some extent.

Second, many virtually hazardous wastes are not considered hazardous. A waste can be almost ignitable or EP toxic and not be a hazardous waste. "A waste is EP toxic, and therefore legally hazardous, if a leaching analysis exceeds 100 times the drinking water standard for specified constituents. It is not hazardous if the leaching analysis exceeds the drinking water standard by a factor of 95 or even 99."³²

Third, while generators were required to conduct an initial EP toxicity test to determine whether their wastes were hazardous, there is no express requirement that they continue to conduct that test periodically.³³ Because of process changes, new product developments, and other reasons, it is possible that wastes not previously considered hazardous should now be considered hazardous. Some hazardous wastes may currently be improperly disposed, stored, or treated as nonhazardous industrial waste. The disparate treatment of hazardous and nonhazardous waste, moreover, creates incentives to get wastes out of Subtitle C in ways that may not be consistent with environmental or public health protection (e.g., interpreting EP toxicity test results creatively, stabilizing or treating hazardous waste in marginal ways, and getting wastes delisted).

Fourth, some industrial waste is potentially more damaging to the environment or public health than some hazardous waste. For example, wastes that are listed as hazardous waste because they contain a particular constituent generally remain legally hazardous regardless of how low the concentration of that constituent becomes.³⁴ In addition, some waste that is considered legally hazardous is chemically identical to waste that is not considered hazardous. Some unused chemicals are considered hazardous waste if discarded or spilled, while the same chemicals, if used, may not be legally hazardous if discarded or spilled.³⁵

Fifth, industrial wastes are often disposed of at hazardous waste disposal facilities, and hazardous wastes are often disposed of at industrial waste disposal facilities. For example, some hazardous waste from small-quantity generators is disposed of at industrial waste facilities,³⁶ while some nonhazardous waste is disposed of at hazardous waste facilities. About one-fourth of Pennsylvania's hazardous waste management capacity is used for industrial waste.³⁷

Sixth, while there is a significant regulatory program under Subtitle C for hazardous waste storage, treatment, and disposal impoundments,³⁸ there is virtually no federal regulatory program for industrial waste impoundments under Subtitle D.³⁹ Nor is there a significant federal regulatory program for impoundments under the FWPCA. The NPDES program regulates the treatment and discharge of industrial wastewater, but it does not regulate the design or operation of impoundments that are used for the storage or treatment of that wastewater.⁴⁰ Put another way, the FWPCA does not prevent groundwater pollution from facilities that are designed to prevent surface water pollution. As already noted, industrial waste impoundments appear to represent the largest part of the industrial waste picture, and they have great potential to pollute groundwater and damage water supplies.

Finally, and most fundamentally, the hazardous/nonhazardous boundary is dissolved by other statutes. The broad scope of CERCLA liability has brought municipal, industrial, and hazardous waste facilities into its net, without regard to legal labels.⁴¹ While it is appropriate to debate the effectiveness of CERCLA in cleaning up sites, this debate appears to miss a more basic point. Fear of CERCLA liability, and liability under comparable state [20 ELR 10287] Superfund programs, has profoundly affected the way in which generators and facility operators approach current and future waste management activities. In that respect, the RCRA distinction between Subtitle C and Subtitle D is anachronistic. Being considered a Subtitle D waste or a Subtitle D facility will not help in the long run if the waste or facility is not managed in an environmentally protective manner. In fact, to the extent that industrial waste facilities are managed in a substandard manner compared with Subtitle C facilities, the more likely it is that such facilities will eventually face cleanup under CERCLA or state Superfund programs.

The Toxics Release Inventory (TRI) compiled from the toxic chemicals release information submitted in response to § 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA)⁴² also undermines the hazardous/nonhazardous distinction. The reporting forms include, as one kind of environmental release, the on-site

disposal of toxic chemicals.⁴³ The list of toxic chemicals that must be reported includes many materials that are not hazardous wastes under RCRA.⁴⁴ According to a preliminary evaluation of Pennsylvania's TRI data, more than one-half of the toxic chemicals released into the environment are probably not hazardous under RCRA.⁴⁵ In addition to land disposal of toxic chemicals, fugitive air emissions from their treatment, storage, or disposal are a source of concern.

EPA's commanding role in the Subtitle C program is almost completely reversed in Subtitle D, where many states have found themselves in leadership positions simply because they are trying to solve their own problems. For both municipal and industrial waste, states have moved in different ways, at varying paces.⁴⁶ Some have given the treatment, storage, and disposal of certain industrial wastes more concentrated attention. For example, California's expansive hazardous waste program covers many wastes that are industrial wastes under RCRA.⁴⁷ Many states, including New Jersey, regulate municipal waste and industrial waste together as solid waste.⁴⁸ A few states, such as Oregon, require waste reduction planning for hazardous waste generators as well as for additional industrial waste generators covered by EPCRA § 313.⁴⁹ Finally, some are undergoing a comprehensive upgrade of their existing programs.

Pennsylvania's Approach

Pennsylvania's Solid Waste Management Act⁵⁰ was completely rewritten in 1980 so that the state could administer its own hazardous waste management program under RCRA. The Act also identified two other waste categories — municipal waste and residual waste (which is mostly industrial waste).⁵¹ Hazardous waste regulations based on RCRA went into effect in 1982. Until 1988, the regulation of hazardous waste management facilities dominated the program. In that year, as evidence of a garbage disposal capacity problem mounted, comprehensive new municipal waste regulations became law,⁵² replacing technologically and environmentally obsolete regulations that had been on the books for more than a decade. Several months later, three new statutes were signed into law. The Municipal Waste Planning, Recycling, and Waste Reduction Act⁵³ requires municipalities across the state to set up curbside municipal waste recycling programs, streamlines the municipal waste planning process at the county level, and provides numerous incentives to host municipalities for the siting of municipal waste landfills and resource recovery facilities. The Hazardous Sites Cleanup Act⁵⁴ created a state Superfund program and also contains incentives to host municipalities for the siting of hazardous waste facilities. The Infectious and Chemotherapeutic Waste Disposal Act⁵⁵ established a temporary moratorium on the permitting of new commercial infectious and chemotherapeutic waste incinerators, and requires manifests and licensing for infectious and chemotherapeutic waste transportation. In early 1990, implementation of all three new laws is well under way.

On February 20, 1990, the Environmental Quality Board, Pennsylvania's rulemaking authority for environmental regulations, published a proposed comprehensive revision to the state's industrial waste management regulations.⁵⁶ Like [20 ELR 10288] the municipal waste regulations, this proposal would replace a short set of outdated industrial waste regulations. The proposal addresses four basic questions.

* *What disposal, processing, and storage facilities should be allowed?* The proposed rulemaking responds to the diversity in industrial wastes and management methods by setting out proposed rules for landfills, disposal impoundments, composting facilities, transfer facilities, and the land application of industrial waste. The proposed rulemaking also addresses incinerators and other facilities that reduce the bulk or volume of residual waste or convert such waste for off-site reuse. In all, the proposal recognizes at least 13 different kinds of disposal or processing facilities.⁵⁷ Industrial waste storage is subject to regulation, although a permit is not required. The proposed regulations contain specific provisions for containers, tanks, piles, and storage impoundments. Transportation requirements are also proposed.⁵⁸

* *How should these facilities be operated?* In general, operational requirements for industrial waste facilities would be based on comparable requirements in the municipal waste regulations, and are intended to achieve a comparable level of environmental protection. Municipal waste landfills in Pennsylvania are subject to regulations that are roughly as stringent as those for a hazardous waste disposal facility because of the diversity in wastes disposed of at these landfills, including small quantities of hazardous wastes and many industrial wastes. The municipal waste regulations therefore require stringent environmental protection measures, including double liners, leachate treatment, and

groundwater monitoring at all municipal waste landfills.⁵⁹ On many issues, the proposed industrial waste regulations are virtually identical to the municipal waste regulations. For example, groundwater monitoring requirements in the municipal waste regulations and proposed industrial waste regulations are similar.⁶⁰

At the same time, the proposed industrial waste regulations recognize that differences in management methods for industrial waste may suggest approaches different from those for municipal waste. Much industrial waste is disposed of in monofills (landfills for only one kind of waste) at or near the generation site. The liner system design is therefore proposed to correspond to the environmental risk presented by individual wastes. Under the proposal, some industrial waste landfills would be required to have two liners, some would have one liner, and some would have no liner (e.g., for certain kinds of industrial construction or demolition waste). Some industrial waste disposal impoundments would have two liners, and some would have one, but none would be unlined.

Storage impoundments, including those used for treatment, were given specific attention. The proposed regulations would require (1) such impoundments to be approved as part of an NPDES or related water quality permit, (2) groundwater monitoring, and (3) one or two liners, depending on the characteristics of the waste.⁶¹

* *What wastes should be allowed to go to specific facilities?* Under the proposed industrial waste regulations, virtually no waste would be allowed to go to any facility without DER approval based on an analysis of the waste stream's physical properties and chemical composition, and a plan for ongoing analysis of the waste.⁶² This is necessary to ensure that the waste can be handled safely and that the waste received for disposal or processing is the same waste that was approved by DER. At lined disposal facilities, a chemical analysis is also necessary to ensure that specific waste streams are chemically compatible with the liner material.

The proposed regulations also contain a waste classification system for assigning particular wastes to different types of disposal facilities. This system is based on leaching analyses performed as part of the permit application. These analyses would be used to determine whether waste could go to an unlined, single lined, or double lined landfill, or to a single lined or double lined disposal or storage impoundment.⁶³ The mechanical rules in this part of the proposal are designed to allow faster review of waste stream approval requests by DER than would be required by painstaking site specific analyses.

* *How can the amount of waste that requires disposal be minimized?* This is the most important of the four questions. The sheer volume of industrial waste makes an obvious and compelling case for waste minimization, reuse, and beneficial use. The proposed residual waste regulations respond to this need in several ways. In addition to the requirements described above for getting a waste stream approved for a particular disposal or processing facility, the generator would have to provide a waste minimization opportunity assessment. Preparation of the assessment would force the generator to think about ways to save money and reduce liability by minimizing the amount of waste from the plant that requires disposal, particularly by reducing the amount of waste that is generated.⁶⁴ General information in the assessment would be publicly available, while process information and other data that may be proprietary would be kept at the plant. It is appropriate to require generators to consider waste minimization at the same time they plan to comply with a comprehensive new regulatory program. Pennsylvania's stringent new municipal waste regulations have given a powerful [20 ELR 10289] boost to implementation of the mandatory recycling program.

The proposal also encourages alternatives to disposal for waste that is already generated. The proposal would create a simplified system for regulating facilities that process waste to recover a usable product, to recover distinct components as separate end products, or to make material suitable for beneficial uses.⁶⁵ The proposal also contains extensive provisions for the beneficial use of industrial waste, including coal ash.⁶⁶ Some industrial waste facilities that are operated for energy recovery would be subject to permit by rule.⁶⁷ Land application of industrial waste for agricultural use or the reclamation of mine sites would also be authorized.⁶⁸ As an incentive, these options would all be subject to a significantly less stringent regulatory regime than any option involving landfills or disposal impoundments.

Because they are modeled on the municipal waste regulations, the proposed industrial waste regulations may help the siting of new facilities and bring other economic benefits. Pennsylvania's municipal waste regulations greatly help facility siting by providing relative certainty about whether a permit application will be approved or denied. The municipal waste regulations are cast mostly in terms of performance rather than design, and are written and organized so that industry and the public have a relatively clear idea of what DER expects. It helps, too, that the information

required for a permit application is quite detailed and that the regulations direct DER to approve or deny a permit application within a specified period. Because the municipal waste regulations are among the most stringent in the nation, proposed facilities are likely to be less objectionable to local groups. Although siting continues to be painful and difficult, Pennsylvania is no longer facing a disposal capacity crisis.

The proposed industrial waste regulations are generally written and organized in the same way, and should have the same general effect. The ability of business to make reliable planning decisions based on a set of regulations can help offset the effects of their stringency. It is also becoming clear that the availability of environmentally protective industrial waste management facilities and low-cost environmentally protective alternatives to industrial waste disposal are important considerations in business expansion and relocation decisions. Uniform rules also help create a competitive climate in which environmental protection is less likely to be sacrificed, and help protect against future liability under CERCLA or the state's Superfund law. In addition, Pennsylvania's experience with the municipal waste program indicates that the business expansion associated with large scale recycling can be an important economic development tool.

Proposed Federal Legislation

The innovative ideas shaping the industrial waste programs that Pennsylvania and some other states are developing should be considered in reauthorizing RCRA. However, the 101st Congress has not yet addressed these ideas in the bills introduced to date.

Three basic RCRA reauthorization bills are now pending in Congress: the proposed Waste Materials Management Act of 1989⁶⁹ (Rep. Luken, D-Ohio), the Waste Minimization and Control Act of 1989⁷⁰ (Sen. Baucus, D-Mont.), and the Municipal Solid Waste Source Reduction and Recycling Act of 1989⁷¹ (Sen. Chafee, R-R.I.). Although the bills pay some attention to industrial waste, the overwhelming focus of all three bills is on municipal waste.⁷²

It makes sense for Congress to be concerned with municipal waste, since the problem is significant⁷³ and has attracted widespread public attention. More fundamentally, solutions to this problem (particularly recycling) tend to involve individuals in their own lives, and offer a virtually unparalleled opportunity to teach the public about environmental stewardship. The importance of such legislation thus transcends the specific environmental and public health benefits that result from proper municipal waste management.

At the same time, the magnitude of the industrial waste problem demands substantial attention. Unfortunately, the bills introduced do not reflect this kind of attention. The introduced bills' Subtitle D provisions, which generally concern solid waste, seem addressed mostly to municipal waste, and only incidentally or even accidentally industrial waste.⁷⁴ Still, it is possible to glean the elements of what might loosely be called an industrial waste strategy from these bills.

The Luken bill is the most comprehensive of the three and the bill that most directly addresses industrial waste.⁷⁵ EPA is expressly required to promulgate regulations and guidelines governing industrial waste. The bill would require state plans to include regulations conforming with the federal provisions, and would require state permits to comply with these provisions. Two years after the bill becomes law, each state would be required to have a permit program for all solid waste facilities, including both municipal and industrial waste. EPA would be authorized to take enforcement action against violators.⁷⁶

All three bills would require states to develop a plan to ensure available capacity for their solid waste and to submit that plan to EPA for approval.⁷⁷ The Luken bill would require state plans to provide for recycling of 25 percent of all solid waste within four years after the bill was [20 ELR 10290] enacted, and 50 percent in eight years.⁷⁸ Inclusion of industrial waste in this recycling goal may not be intended, however. While the list of materials to be considered for recycling includes office paper, beverage containers, and similar materials, the list does not include paper mill sludges or utility coal ash.

The bills would create a waste reduction and recycling clearinghouse within EPA to disseminate information to state and local governments and to the public, including businesses interested in waste reduction and recycling.⁷⁹ The Luken bill would also create a Presidential Commission on Waste Reduction that would focus on waste reduction by product manufacturers, product durability, and labeling on packaging concerning recyclability. Although it appears that the

Luken bill's procurement requirements for recycled materials can be interpreted to include industrial waste, the bill does not explicitly consider such waste for procurement.⁸⁰

The most significant industrial waste reduction measure is in the Baucus bill. This measure would prohibit the release of hazardous substances in quantities that represent more than five percent of production throughput and would set up a system for improving waste efficiency rates. Some industrial waste would fall under the definition of hazardous substances, and thus would be affected. This bill would also require EPA to conduct a study of the capability of industry to reduce waste volumes and toxicity.⁸¹ The Luken bill would require a broader study to fill in data gaps for industrial waste. EPA would be required to prepare a preliminary report identifying and classifying industrial waste by quantity, character, and management practices. At the same time, EPA would be required to study the environmental and health effects of the disposal of most industrial wastes. Then, all industrial waste generators, transporters, and waste management facility operators would have to file a brief notice of their wastes and activities. After that, EPA would revise its preliminary report.⁸²

A companion to the Luken bill⁸³ would impose a tax on virgin materials used to manufacture or produce any taxable product of certain listed industries. The listed industries, reflecting the dominance of municipal waste concerns, include glass containers, sanitary food containers, metal cans, and paperboard mills. Proceeds from the tax would be placed in a trust fund to provide financial assistance to states and to support a waste reduction and recycling clearinghouse. Apart from general revenues, no other funding sources are proposed.

Finally, the Luken bill addresses industrial waste by proposing to change the boundary between Subtitle C and Subtitle D. In fact, the bulk of the Luken bill's Subtitle C amendments concern the boundary issue. For example, EPA would be required to determine that wastes are hazardous based on factors that are not now generally considered (e.g., acute toxicity, persistence and bioaccumulation potential, aquatic toxicity, and carcinogenicity). Many generators would be required to test wastes every two years to determine if these wastes are hazardous. In addition, the bill declares that used oil is not a hazardous waste and sets out detailed requirements for its management, including recycling.⁸⁴

An Alternative Approach: Program Goals

The RCRA reauthorization bills currently before Congress contain the germ of some useful ideas for regulating industrial waste. However, aside from the boundary issue between Subtitle C and Subtitle D waste, these ideas are tentative and not fully developed. Regardless of the legitimate interest being directed toward the comprehensive municipal waste proposals in the three bills, industrial waste deserves more specific and concentrated attention. Municipal waste issues dominate the public consciousness so intensely that industrial waste is not likely to be fully and thoughtfully addressed unless all substantive aspects of industrial waste management are dealt with in a separate part of the legislation.⁸⁵

In developing such legislation, Congress should consider four basic program goals.

Energy and Materials Conservation

The resolution of all waste issues involves this common theme, which is another way of describing pollution prevention.⁸⁶ The 7,600 million tons of industrial waste produced annually in the United States represents a huge amount of wasted energy and material. Permanent and complete containment of all these wastes in disposal facilities is a daunting prospect. A national energy and materials conservation policy can be justified not only as a way of controlling releases of waste into all media (air, water, and land), but also as a way of strengthening the national economy and enhancing national security. While this is clearly a larger issue than RCRA alone, the reauthorization offers a good opportunity to help develop and implement such a policy, and to use waste management as an example of how it can be done.

Environmental Protection at Waste Management Facilities

A national regulatory scheme is needed that roughly corresponds to the oversight needed for particular wastes and that reduces the environmental risks associated with getting a waste out of Subtitle C coverage. By itself, changing [20 **ELR 10291**] the boundary between Subtitle C waste and Subtitle D waste will not solve that problem. No matter what

the boundary becomes, some Subtitle D wastes will need to be managed at facilities that offer a level of environmental protection comparable to that at hazardous waste facilities. At the same time, less stringent requirements may be appropriate for other wastes that present smaller risks. This is not a call for site-by-site or waste-by-waste risk analyses, but rather a realization of the need for a regulatory program that uses waste classification systems and related rules to mechanically assign waste to particular types of facilities. These first two program goals should be given equal support. Waste minimization, particularly reduction of the amount of waste that is generated, should be funded to provide for staffing, resources, and status comparable to that enjoyed by the facilities management program. This would provide a more permanent and certain way of protecting the environment and public health than would focusing resources almost exclusively on the design and operation of treatment, storage, and disposal facilities.

Prompt and Significant Results

It is easy to develop a regulatory program. It is much harder to give the public results. Twenty years after Earth Day, much has been learned about what works and what does not work in federal environmental legislation. In addition, when Congress overloads EPA with rulemaking responsibilities, required regulations are often published years late, and then only after litigation.⁸⁷ Repeating that pattern here would be particularly unfortunate because more than 27,000 industrial waste disposal facilities, the overwhelming majority of which are poorly designed and monitored, contain as much as 94 percent of the nation's hazardous, municipal, and industrial waste.⁸⁸ Congress might treat the RCRA reauthorization as an opportunity to be creative about the nagging problem of program effectiveness. The basic challenge, in the face of a potentially huge program at a time of severe budget constraints, is designing a streamlined and efficient regulatory system for industrial wastes that will be at least as environmentally protective as Subtitle C.

Genuine State and Federal Partnership

Federal environmental laws are usually based on a cooperative federalism model in which Congress and a federal agency develop minimum standards and procedures, and the states implement them in return for significant federal grants. The model made sense in the 1970s when state environmental agencies were often poorly staffed and trained and had little sense of overall direction. In this way, the model has helped the states protect the environment.⁸⁹

But in the Subtitle C program, the model has wasted enormous resources because of EPA's bureaucratic nit-picking and rigidity, which may be unparalleled in other federal environmental programs. The state authorization process is so complex and difficult that few state programs are fully authorized.⁹⁰ Other shortcomings of the model's application to Subtitle C include EPA's failure to recognize valid state enforcement tools not represented in federal law, an unwillingness to recognize state court precedents that support approaches other than EPA's, and EPA's strong aversion to state criminal enforcement efforts, notwithstanding their deterrent value.

State environmental programs in the 1990s generally have larger and more professional staffs, more public support, and more ability to protect the environment than they did in the 1970s. In fact, the overwhelming majority of all environmental enforcement actions are, and will continue to be, carried out by the states.⁹¹ At the same time, state waste regulatory programs plainly vary in effectiveness. Even states with strong hazardous or municipal waste programs may not be giving significant attention to industrial waste. While a minimum federal floor is necessary to prevent economic blackmail by industries that threaten to relocate in less environmentally protective states, Congress needs to design a system that concentrates EPA's attention on the states that really need help and gives substantial discretion to states with more advanced programs. Congress also needs to design a system that is more respectful of legitimate differences in state programs.

An Alternative Approach: Program Content

The following suggestions illustrate the kinds of RCRA programs that could be put in place to implement these four program goals. Some of these suggestions build on Pennsylvania's proposed industrial waste regulations, while some build on ideas contained in other state programs or the reauthorization bills. Other ideas will, no doubt, emerge during the legislative process.

Waste Reduction

The Commerce and Energy Departments should help industry reduce the volume and toxicity of industrial waste that is

generated. These agencies could develop industry-by-industry analyses concerning the ratio between waste generation and production throughput, which could then be used to encourage industry to engage in waste reduction. For certain waste streams, these analyses could also be used to develop guidelines concerning optimal limits for [20 ELR 10292] waste generation per unit of production throughput or guidelines for recommended best management practices to reduce the amount of waste generated.⁹² EPA should write air and water pollution control regulations that give priority to minimizing the volume and toxicity of treatment sludges and other wastes that are produced.⁹³ In addition, the Commerce or Energy Departments should be directed to develop and fund research and demonstration projects for innovative waste reduction techniques for manufacturing and other processes that lead to the production of industrial waste.⁹⁴ States should be encouraged to engage in the same kinds of activities, focusing on their major industries. The availability of new or modified waste reduction techniques would lead many industries to begin employing these technologies, thereby reducing the amount of waste that the states would need to worry about.

Developing waste reduction technologies would be greatly assisted if industrial waste generators were required to conduct Oregon-type waste reduction planning, or waste minimization opportunity assessments, as in Pennsylvania's proposed regulations. These plans or assessments could be conducted primarily as a self-study and the results could be made available to the public. Such plans or assessments would enable some industries to show the public how much waste reduction they have accomplished, while drawing public attention to those that have done little.

Alternatives to Disposal

EPA, in cooperation with the Energy and Commerce Departments, could be directed to develop and fund research and demonstration projects for innovative and environmentally protective methods for reusing and reclaiming industrial waste, instead of disposal. This should also include toxicity or volume reduction that would allow alternatives to disposal.⁹⁵ State environmental agencies, in cooperation with their commerce or energy agencies, could be directed to develop similar programs. Once again, this kind of information would immediately influence industry management decisions about handling specific wastes and would reduce the amount of waste requiring disposal.

The development of disposal alternatives depends on at least three other elements. As in Pennsylvania's proposed industrial waste regulations, the federal regulatory program should contain standards or guidelines setting forth environmentally acceptable practices for the land application of industrial waste, composting, and other alternative processing or treatment methods. Then, those seeking such alternatives will not be discouraged by uncertainty about what they need to do. In addition, environmentally protective reuse standards would facilitate the reuse of many wastes. The reuse of industrial waste would be much less likely to present environmental and public health risks if such standards were in place.⁹⁶ Finally, government procurement requirements for products containing reused or reclaimed industrial waste would help generate markets for such products.

Technical Assistance

Congress should establish a national technical assistance and information-sharing clearinghouse within either EPA, the Commerce Department, or the Energy Department, to assist energy and materials conservation through industrial waste reduction, reclamation, and reuse. This clearinghouse should be funded and operated independently from any comparable clearinghouse for municipal waste. The states, through their own commerce departments or other agencies, should be encouraged to cooperate in this work, to help develop priorities, and to develop their own technical assistance and information-sharing program for industrial waste reduction, reclamation, and reuse. More complete information would enable many industries, particularly smaller industries, to make better decisions about how to reduce and handle their own wastes.

Notice

Congress should require, shortly after RCRA is reauthorized, that each generator, transporter, and industrial waste treatment, storage, or disposal facility operator send notice to the state identifying its activity, its location, and the kind and amount of industrial waste produced. This notice could also extend to identification of abandoned facilities or disposal facilities used in the past 10 or 20 years. States should collect and organize these data and make them public. This concept, which is borrowed from EP-CRA § 313,⁹⁷ would build on what has been learned from implementation of that Act. The notice would provide useful information to government officials, the public, and industry managers. The

notice would also encourage industry to improve waste management and reduce waste generation. Similar results are occurring for the toxic chemicals release information developed under § 313. The notice requirement would also close some of the data gaps that exist for industrial waste, and would probably provide more information than a study conducted solely by EPA or an EPA contractor. This notice should be required on a biannual basis to provide a baseline and progress report on waste minimization across the country within specific industries.⁹⁸ This notice could also be tied to a [20 ELR 10293] waste reduction planning requirement for industrial waste generators, based on Oregon's law. Data collected from this notice would help measure the effectiveness of the industrial waste program.

Best Available Demonstrated Technology

EPA should develop best available demonstrated technology guidelines and manuals for disposal facilities (e.g., for double-lined landfills, single-lined landfills, and natural attenuation landfills) and also determine what kinds of wastes can safely go to each facility. Guidelines should also be prepared for facilities and methods that provide alternatives to disposal. The states should be able to use these suggestions at their discretion, modify them so that they have comparable or improved effectiveness, and share information about specific designs with other states, EPA, and industry. Basically, the design of a facility matters more than the label attached to the waste that goes there. EPA has developed design manuals for hazardous waste disposal facilities and sponsors research concerning problems such as liner design. Based on these data and the experience of the various states, EPA should be required to make suggestions about the best available demonstrated technologies and to make this information available through manuals, guidelines, or computerized data banks.⁹⁹ Because optimal design for these facilities is rapidly evolving and because not all proposed designs are effective, this kind of information is particularly important. On a day-to-day basis, it would be valuable to permit writers in state agencies.

Federal Standards

Congress would be well served if it established minimum standards for the states. These standards should focus on what kinds of management practices are necessary to protect the environment and public health. They should be performance oriented and allow the states discretion in deciding how to achieve the desired standard of performance. These standards should be brief and focus only on the most important questions. There are several ways of establishing minimum standards and avoiding the prolonged delays associated with EPA rulemakings. One way is for Congress to have substantive program requirements implemented in two steps, as it did with the interim and permanent programs under the Surface Mining Control and Reclamation Act.¹⁰⁰ Congress could then bypass EPA rulemaking altogether for the interim program and give the states a specific time to put in place regulatory programs to meet certain basic standards. Another is to direct the states to use the nearly finalized Subtitle D municipal waste regulations for industrial waste unless they have good cause not to. Still another is to use best available demonstrated technology guidelines or manuals to provide technical support and detail for more general performance standards set by RCRA. These options, of course, do not necessarily preclude subsequent EPA rulemakings.

Program Implementation

States should be responsible for implementing these programs and should be given substantial discretion in choosing the means of implementation. EPA oversight of state programs should focus on achievement of overall standards of performance, rather than on micromanagement and second-guessing of program details. The implementation system should be structured to solve the larger problems first, the next largest problems second, and so forth. Congress could define some of these problems, and leave others to be worked out between EPA and individual states. Moreover, ongoing state initiatives containing industrial waste regulatory programs should not be unraveled or forced to start over. EPA should focus most of its oversight resources on states with the greatest implementation problems. For a program of this magnitude, Congress should recognize that complete implementation is likely to take at least 5 to 10 years. This system would enable the states to quickly show results on the worst problems and set their priorities accordingly.

Funding

Because of the current budget situation, an independent funding mechanism will be needed in any RCRA reauthorization to create an effective, nonsymbolic, result-oriented program. The virgin materials fee proposed in the Luken bill is an independent funding mechanism, but Congress needs to apply a fee to industrial waste. Otherwise, there will be insufficient staffing for industrial waste programs, and the industrial waste reduction and disposal

alternative programs described here will be given only token support. Charging a fee for industrial waste generation or industrial waste management would also help encourage waste reduction and alternatives to disposal, and would create a highly useful source of information about industrial waste. The funding mechanism should be simple to administer, with collected moneys placed in a trust fund. A large share of this trust fund should be distributed to the states to implement their programs. In addition, the imposition of any federal funding mechanism should not prejudice the ability of the states to set up a similar mechanism to fund their own programs.

Relation to Subtitle C

As the Luken bill indicates, Congress will need to decide whether to keep or change the present boundary between Subtitle C waste and Subtitle D waste. There is no shortage of argument that the current definition of hazardous waste includes some waste that should be excluded and ignores some waste that should be classified as hazardous. EPA's final regulation replacing the EP toxicity test with the toxicity characteristic leaching procedure will not end that argument.

[20 ELR 10294]

The boundary issue presents opportunities and risks. Moving a waste into Subtitle C puts it into an existing regulatory program, rather than into a program that is under development. It also makes sense for Congress to try to correct some of the worst boundary problems simply to help rationalize the Subtitle C program. The risks are considerable, however. The label "hazardous waste" conveys a profoundly different meaning to the public than does "nonhazardous waste" or other labels and can have a negative effect on siting. In addition, searching for an optimal boundary between "hazardous" and "nonhazardous" waste is unrealistic and diverts energy and resources from more important tasks. Whether or not the boundary is changed, there will still be some Subtitle D wastes that, if disposed, will require a facility that is comparable in design to a hazardous waste disposal facility.

In the final analysis, the best approach to RCRA reauthorization will involve more than simply an upgrading of Subtitle D. Congress should consider making RCRA more flexible and more capable of achieving environmental results. EPA's ongoing 90-day study on RCRA effectiveness, as well as other studies on EPA's hazardous waste program,¹⁰¹ should help Congress improve the administration of Subtitle C. However, unless Subtitle C is amended, merely increasing the range of Subtitle C wastes will subject the states to a rigid federal program that has even broader scope.

Conclusion

This article is more than another wake-up call to the magnitude of the industrial waste problem.¹⁰² It is a call to think about RCRA differently.

In their challenging and thoughtful book, *The Environmental Protection Agency: Asking the Wrong Questions*,¹⁰³ Marc Landy, Marc Roberts, and Stephen Thomas argue that EPA, Congress, and others should improve the quality of the environmental protection debate by framing better questions. After reviewing six case studies, including the development of the RCRA regulations, they conclude that issues were oversimplified, that strategic questions were ignored or avoided, and that there are widespread public misperceptions about environmental problems as a result.¹⁰⁴ The right questions, they suggest, focus on reducing rather than eliminating risk, and improving the quality of life where people live and work.¹⁰⁵

The RCRA reauthorization process should reflect the continuum between industrial and hazardous waste, give waste minimization as much attention as facilities management, provide prompt results, and give states a greater role in program implementation. Taking this course would reduce risks and improve the quality of life, and can be based on what has been achieved to date. Hazardous waste programs have developed highly useful information about how to design, operate, and regulate hazardous waste treatment, storage, and disposal facilities. These same programs have also trained many experienced personnel at both the state and federal levels. The municipal waste permitting and recycling programs being developed in many states, as well as some industrial waste programs, show that states are willing and able to take on the task of regulating Subtitle D wastes. The problems associated with the treatment, storage, and disposal of industrial waste have been left for last. While there is no doubt that municipal waste deserves significant attention, industrial waste deserves separate and careful consideration. With RCRA reauthorization currently under way, Congress has a good opportunity to advance environmental stewardship — better perhaps, than we may

have imagined.

2. 53 Fed. Reg. 33314 (Aug. 30, 1988) (proposed rulemaking).

3. In this Article, industrial waste refers to waste generated by industrial processing or manufacturing operations that is not defined legally as hazardous. Such operations include factories, foundries, mills, processing plants, refineries, and slaughterhouses. The term "industrial waste" includes sludges and other waste from industrial waste treatment and water pollution control facilities. The term does not include oil and gas waste, or mining waste, although conclusions in this Article may apply to those wastes.

4. U.S. EPA, 1 REPORT TO CONGRESS: SOLID WASTE DISPOSAL IN THE UNITED STATES 11 (1988) [hereinafter cited as REPORT TO CONGRESS]. This figure was calculated by adding figures for "municipal solid waste," household hazardous waste, municipal waste combustion ash (high estimate), construction and demolition waste, municipal water and wastewater treatment sludge, and infectious waste. Inclusion of these wastes reflects a more realistic assessment of what is ordinarily regulated as municipal waste than "municipal solid waste" alone.

5. U.S. EPA, THE WASTE SYSTEM, ES-4 (1988) (figure converted from metric tons).

6. 1 REPORT TO CONGRESS, *supra* note 4, at 11. Recycled industrial waste is not included in the total. *Id.* This figure also does not include two other significant categories of Subtitle D waste: (1) oil and gas wastes, including drilling waste (129 to 871 million tons) and produced waters (1,966 to 2,738 million tons); and (2) mining waste (more than 1,400 million tons). *Id.*

7. The magnitude of these figures is not changed significantly by EPA's final regulation replacing the extraction procedure (EP) toxicity test with the toxicity characteristic leaching procedure (TCLP) for determining whether waste is hazardous. 55 Fed. Reg. 11796 (Mar. 29, 1990). EPA estimates that the rule will significantly increase the amount of waste considered hazardous. If the TCLP tripled the amount of hazardous waste, it would increase from 300 million tons to 900 million tons, and reduce the amount of industrial waste from 7,600 million tons to 7,000 tons. Industrial waste would represent about 86 percent of the total of the three waste streams.

8. 1 REPORT TO CONGRESS, *supra* note 4, at 11. EPA found off-site disposal to be the predominant disposal method for the following industries: electrical machinery and electrical components; food and kindred products; industrial organic chemicals; leather and leather tanning; machinery (except electrical); pharmaceutical preparations; and soaps, other detergents, and polishing, cleaning, and sanitation goods. 2 REPORT TO CONGRESS, *supra* note 4, at B-16 to B-21.

9. 2 REPORT TO CONGRESS, *supra* note 4, at 3-22. The rest is about evenly divided between landfills, waste piles, and land application units.

10. *Id.* at 4-103.

11. 33 U.S.C. § 1342, ELR STAT. FWPCA 051.

12. Pennsylvania Environmental Quality Board, preamble to proposed residual waste regulations, 20 Pa. Bull. 1107, 1108 (Feb. 24, 1990). The 16 million-ton figure does not include oil and gas waste, or mining waste.

In general, residual waste is nonhazardous waste from industrial, mining, and agricultural operations, and includes sludges from waste from industrial, mining, and agricultural waste treatment or pollution control facilities. 35 PA. STAT. ANN. § 6018.103 (Purdon 1989). The overwhelming majority of residual waste in Pennsylvania appears to be from industrial sources. To avoid confusion, this Article generally refers to industrial waste in Pennsylvania when the more accurate term is residual waste.

On-site disposal of oil and gas drilling wastes in Pennsylvania is regulated under the Oil and Gas Act, 58 PA. STAT. ANN. § 601.101-.605 (Purdon 1989). On-site disposal of mining waste is regulated under the Surface Mining Control and Reclamation Act, 52 PA. STAT. ANN. § 1396.1-.31, the Coal Refuse Disposal Control Act, 52 PA. STAT. § 30.51-.66, and the Noncoal Surface Mining Control and Reclamation Act, 52 PA. STAT. ANN. §§ 3301-26.

[13.](#) 1 REPORT TO CONGRESS, *supra* note 4, at 36.

[14.](#) 20 Pa. Bull. at 1109. These combustion residues also include a comparatively small amount of ash from the incineration of industrial waste.

[15.](#) PA. DEPT OF ENVTL. RESOURCES, SURFACE IMPOUNDMENT ASSESSMENT 22 (1980) [hereinafter cited as SURFACE IMPOUNDMENT ASSESSMENT].

[16.](#) 1 REPORT TO CONGRESS, *supra* note 4, at 34-38. An April 1990 General Accounting Office (GAO) study reached the same conclusion: "EPA's data strongly suggest that some industrial facilities may contaminate groundwater and thus threaten human health and the environment." GENERAL ACCOUNTING OFFICE, NONHAZARDOUS WASTE: ENVIRONMENTAL SAFEGUARDS FOR INDUSTRIAL FACILITIES NEED TO BE DEVELOPED 17 (1990) [hereinafter cited as NONHAZARDOUS WASTE].

[17.](#) 1 REPORT TO CONGRESS, *supra* note 4, at 13.

[18.](#) 2 *id.*, at 4-103, 4-109.

[19.](#) *Id.*, at 4-109. Some impoundments were also causing surface water and air pollution. *Id.*

In its recent report, the GAO reviewed 112 industrial waste facilities in New Jersey and California with groundwater monitoring systems. Of these, 32 (or 29 percent) were known or suspected to be the source of groundwater contamination. NONHAZARDOUS WASTE, *supra* note 16, at 40.

[20.](#) SURFACE IMPOUNDMENT ASSESSMENT, *supra* note 15, at 79-90, 154. The report looked at known or suspected groundwater contamination cases from the following kinds of impoundments: agricultural, mining, municipal, oil and gas, bulk storage, and industrial. *Id.* at 21-24.

[21.](#) 1 REPORT TO CONGRESS, *supra* note 4, at 37. Significantly, land application units appear to be much better controlled. EPA found that about two-thirds of these units had run-on/run-off controls and restrictions on the receipt of liquid wastes, that more than 70 percent had waste application rate limits, and that more than 40 percent had restrictions on the growing of food chain crops. *Id.*

[22.](#) These examples are cited at 20 Pa. Bull. 1109-10.

[23.](#) *Id.* Because DER's enforcement strategy for industrial waste management facilities has been directed toward the larger facilities, DER believes that most unpermitted facilities are relatively small.

[24.](#) 42 U.S.C. §§ 9601-75 (1982), ELR STAT. RCRA 001-036.

[25.](#) 42 U.S.C. §§ 6921-39b (1982), ELR STAT. RCRA 010-026; 40 C.F.R. pts. 260-270.

[26.](#) 40 C.F.R. pt. 257.

[27.](#) Florini, Denison, & Rathbun, *EPA's Delisting Program for Hazardous Wastes*, [19 ELR 10558](#) (1989).

[28.](#) 42 U.S.C. § 6903(5), ELR STAT. RCRA 005.

[29.](#) For a discussion of EPA's problems in drafting the initial RCRA regulations, including the regulatory definition of hazardous waste, see M. LANDY, M. ROBERTS, & S. THOMAS, THE ENVIRONMENTAL PROTECTION AGENCY: ASKING THE WRONG QUESTIONS 89-132 (1990).

[30.](#) 55 Fed. Reg. 11796 (Mar. 29, 1990).

[31.](#) CONSERVATION FOUND., STATE OF THE ENVIRONMENT: A VIEW TOWARD THE NINETIES, 135-93 (1987).

[32.](#) 20 Pa. Bull. at 1109. The same result can occur with the TCLP.

[33.](#) 42 U.S.C. § 6922(a)(1), ELR STAT. RCRA 012; 40 C.F.R. § 262.11.

[34.](#) 40 C.F.R. § 261.30.

[35.](#) *E.g.*, 55 Fed. Reg. 11798, 11812 (Mar. 29, 1990) (nonhazardous trivalent chromium can be converted into hazardous hexavalent chromium in many situations); 40 C.F.R. § 261.32 (waste that is hazardous because it comes from a specific source may have the same or similar chemical characteristics as waste that is not hazardous because it comes from a different source).

[36.](#) EPA found that 12.3 percent of industrial waste landfills, 14.7 percent of industrial waste impoundments, and 3.1 percent of industrial waste land application units received small-quantity generator hazardous waste. 2 REPORT TO CONGRESS, *supra* note 4, at 3-29.

[37.](#) 20 Pa. Bull. 1110.

[38.](#) In addition to complying with regulations that are applicable to all treatment, storage, or disposal facilities, operators of surface impoundments must comply with the specific requirements in 40 C.F.R. § 264.220-.231.

[39.](#) Because industrial waste disposal impoundments can be open dumps under RCRA (42 U.S.C. § 6903(14), ELR STAT. RCRA 005), RCRA's prohibition against open dumps (42 U.S.C. § 6945(a), ELR STAT. RCRA 028), applies to them. EPA's open dump criteria (40 C.F.R. pt. 257), however, do not apply to facilities that treat or store industrial waste.

[40.](#) The FWPCA generally focuses on surface water discharges from waste water treatment impoundments, not discharges into groundwater from such impoundments. 33 U.S.C. §§ 1311, 1342, ELR STAT. FWPCA 025, 051. EPA may consider the nonsurface water quality effects of impoundments in developing technology-based effluent limitations. 33 U.S.C. § 1314(b)(1)(B), ELR STAT. FWPCA 031. However, this does not lead to direct regulation of such structures.

[41.](#) 42 U.S.C. § 9601(14), ELR STAT. RCRA 004. Hazardous waste is only one of six categories of substances included in the definition of hazardous substance. The release or substantial threat of a release of a hazardous substance triggers CERCLA liability. 42 U.S.C. §§ 9604(a), 9607(a), ELR STAT. RCRA 006.

[42.](#) 42 U.S.C. § 11023, ELR STAT. EPCRA 006. Section 313 generally requires owners and operators of facilities that manufacture, process, or otherwise use toxic chemicals to submit a form to EPA and the state by July 1, 1988, and each year thereafter. The form must describe toxic chemical releases by the facility into the environment, and is intended for federal, state, and local governments "and the public, including communities surrounding covered facilities." *Id.* § 11023(h), ELR STAT. EPCRA 007.

[43.](#) Owners or operators must report on-site releases of toxic chemicals to the environment in the following categories: fugitive or nonpoint air emissions, stack or point air emissions, discharges to water, underground injection, and releases to land. Off-site releases must be reported in only two categories: discharge to publicly owned treatment works and transfer to other off-site location. 40 C.F.R. § 372.85.

[44.](#) Compare 40 C.F.R. § 372.65 with 40 C.F.R. pt. 261.

[45.](#) This preliminary analysis was performed by Scott E. Walters, Environmental Chemist, Bureau of Waste Management, DER. A significant number of these chemicals were disposed of on land at the site. The fate of toxic chemicals transferred off-site is not disclosed by the reporting form.

[46.](#) The GAO reviewed industrial waste programs in Alabama, Ohio, Pennsylvania, Tennessee, Texas, and Washington. The GAO found significant variation in whether surface impoundments require permits, liner and groundwater monitoring requirements, and inspections. NONHAZARDOUS WASTE, *supra* note 16, at 28-37.

[47.](#) Compare CAL. ADMIN. CODE tit. 22, §§ 66300, 66305, 66680, and 66693-66708 with 40 C.F.R. pt. 261.

[48.](#) N.J. Stat. Ann. § 13:1E-3(a). New Jersey's solid waste regulations apply to both industrial and municipal waste. N.J. ADMIN. CODE tit. 7, §§ 26-1.1 to 26-12.14.

[49.](#) OR. REV. STAT. § 465.003-.037 (1989); see Hansen, *Pollution Prevention Planning: A New Mandate for Oregon's Environment*, ENVTL. F., Sept./Oct. 1989, at 30.

[50.](#) 35 PA. STAT. ANN. § 6018.101-.1001 (Purdon 1989).

[51.](#) In general, residual waste is nonhazardous waste from industrial, agricultural, and mining operations. See *supra* note 12. Municipal waste is generally waste from the operation of residential, municipal, commercial, and institutional establishments, and from community activities. 35 PA. STAT. ANN. § 6018.103. Separate regulatory programs for municipal and industrial waste are specifically authorized at 35 PA. STAT. ANN. §§ 6018.201 and 6018.301-.303, respectively. As previously noted, *supra* note 12, the term industrial waste will be used to describe this proposal, even though the proper regulatory term is residual waste.

[52.](#) 18 Pa. Bull. 1681 (Apr. 9, 1988), 25 Pa. Admin. Code chs. 271-85. The regulations blended and built on the experience of DER personnel in the solid waste program, comments from the Solid Waste Advisory Committee during the development of the regulations, comments received during the public comment period for the proposed regulations, the state's hazardous waste and coal mining regulations, and EPA's open-dump criteria (40 C.F.R. pt. 257).

[53.](#) 53 PA. STAT. ANN. § 4000.101-.1903 (Purdon 1989).

[54.](#) 35 PA. STAT. ANN. § 6020.101-.1305 (Purdon 1989).

[55.](#) 35 PA. STAT. ANN. § 6019.1-.6 (Purdon 1989).

[56.](#) 20 Pa. Bull. 1107 (Feb. 24, 1990).

[57.](#) 20 Pa. Bull. 1108. Under the Solid Waste Management Act, disposal or processing of industrial waste requires a permit. Processing is any technology used to reduce the volume or bulk of residual waste or any technology used to convert part or all of such waste materials for off-site reuse. 35 PA. STAT. § 6018.103.

[58.](#) Proposed 25 Pa. Code ch. 299; 20 Pa. Bull. 1268-75.

[59.](#) 25 Pa. Admin. Code ch. 273. Industrial wastes may be disposed of at municipal waste landfills if authorized in writing by DER. 25 Pa. Code §§ 273.421, 273.521. In general, the proposed regulations do not allow the disposal of municipal waste at industrial waste facilities. See, e.g., proposed 25 Pa. Code § 288.423(9), 20 Pa. Bull. 1183.

[60.](#) Compare 25 Pa. Code § 273.281-.288 with proposed 25 Pa. Code § 288.251-.258, 20 Pa. Bull. 1175-77. The proposed industrial waste regulations, however, provide more flexibility on constituents for which monitoring is required.

[61.](#) Proposed 25 Pa. Code § 299.141, 20 Pa. Bull. 1271.

[62.](#) *Id.* proposed §§ 287.131, 287.133, 20 Pa. Bull. 1139-40. Exceptions are wastes generated in quantities of less than one metric ton per month and wastes going to transfer facilities.

[63.](#) E.g., *id.* proposed §§ 288.523(1)-(3), 288.623(1)-(3), 20 Pa. Bull. 1191, 1197-98.

[64.](#) *Id.* proposed § 287.132, 20 Pa. Bull. 1139-40.

[65.](#) Proposed ch. 297, subch. D, 20 Pa. Bull. 1265-68.

[66.](#) Proposed ch. 287, subch. G, 20 Pa. Bull. 1159-63.

- [67.](#) Proposed 25 Pa. Code § 287.102(b), 20 Pa. Bull. 1133.
- [68.](#) Proposed ch. 291, subch. A-E, 20 Pa. Bull. 1234-40.
- [69.](#) H.R. 3735, 101st Cong., 1st Sess. (1989); *see* coverage at 20 ELR 10045.
- [70.](#) S. 1113, 101st Cong., 1st Sess. (1989); *see* coverage at 19 ELR 10368.
- [71.](#) S. 1112, 101st Cong., 1st Sess. (1989); *see* coverage at 19 ELR 10368.
- [72.](#) EPA is preparing a pollution prevention bill that would cover RCRA as well as other federal statutes.
- [73.](#) *See generally* OFFICE OF TECHNOLOGY ASSESSMENT, *FACING AMERICA'S TRASH* (1989).
- [74.](#) The definition of "solid waste" includes both municipal and industrial waste. 42 U.S.C. § 6903(27), ELR STAT. RCRA 005.
- [75.](#) The bill uses a broader definition of "industrial waste" than used in this article. Under the bill, industrial waste is nonhazardous waste from industrial, commercial, mining, or agricultural operations. Oil and gas wastes, as well as mining wastes, are included. H.R. 3735 § 324.
- [76.](#) *Id.* at §§ 304, 324, 345.
- [77.](#) *Id.* § 302; S. 1112, § 112; S. 1113, § 202.
- [78.](#) H.R. 3735, § 302.
- [79.](#) H.R. 3735, § 603; S. 1112, § 107(b); S. 1113, § 304.
- [80.](#) H.R. 3735, §§ 604, 701.
- [81.](#) S. 1113, §§ 305, 306. This provision builds on § 313 of the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. § 11023, ELR STAT. EPCRA 006.
- [82.](#) H.R. 3735, § 324.
- [83.](#) H.R. 3737, 101st Cong., 1st Sess. (1989).
- [84.](#) H.R. 3735, §§ 203, 204, 207-208.
- [85.](#) Congress has done that in RCRA with underground storage tanks (42 U.S.C. §§ 6991-91i, ELR STAT. RCRA 042-047) and medical waste (42 U.S.C. §§ 6992-92k, ELR STAT. RCRA 048-050).
- [86.](#) 54 Fed. Reg. 3845 (1989) (EPA proposed pollution prevention policy). RCRA contains findings that waste represents substantial quantities of wasted materials and energy. 42 U.S.C. §§ 6901(c) and (d), ELR STAT. RCRA 004. The challenge is to translate those findings into an effective program for recovering energy and materials from industrial waste.
- The progressive conservation movement in the late 19th and early 20th centuries saw a clear connection between resource conservation and environmental protection. E.g., G. PINCHOT, *BREAKING NEW GROUND* 504-06 (1947); *see also*, S. HAYS, *CONSERVATION AND THE GOSPEL OF EFFICIENCY* (1959).
- [87.](#) EPA told GAO that it would not be able to promulgate industrial waste regulations until 1996 at the earliest. EPA estimated that it would take three years to collect the necessary data and another three years for the rulemaking process. EPA believes that its existing data do not provide enough information about the hazards posed by industrial waste, the design, operation, and location of industrial waste facilities, groundwater monitoring, and the environmental impact of these facilities. *NONHAZARDOUS WASTE*, *supra* note 16, at 23-27.

[88.](#) 1 REPORT TO CONGRESS, *supra* note 4, at 35-38.

[89.](#) Dernbach, *Pennsylvania's Implementation of the Surface Mining Control and Reclamation Act: An Assessment of How "Cooperative Federalism" Can Make State Regulatory Programs More Effective*, 19 U. MICH. J.L. REF. 903 (1986).

[90.](#) As of January 31, 1990, EPA had authorized only 15 states to administer their own programs under the Hazardous and Solid Waste Amendments of 1984, the most recent RCRA reauthorization statute. U.S. EPA, States Granted Final Authorization for One or More HSWA Provisions (as of Jan. 31, 1990) (undated handout).

[91.](#) Remarks by J. William Futrell, ALI-ABA Course of Study on Environmental Law, Washington, D.C. (Feb. 15, 1990).

[92.](#) The prohibition in S. 1113 against release of hazardous substances that exceed five percent of production throughput seems unduly intrusive to the manufacturing process and not likely to account for differences in manufacturing method at specific plants. Guidelines seem preferable.

[93.](#) *Chemical Manufacturers Ass'n v. EPA*, [870 F.2d 177](#), 262-64, [19 ELR 20989](#) (5th Cir. 1989). EPA's position in that case appears to be inconsistent with its pollution prevention policy.

[94.](#) This research and development proposal builds on existing provisions in RCRA concerning research and development by the Department of Energy. 42 U.S.C. § 6981, ELR STAT. RCRA 037. Apart from a slight difference in focus, this proposal is for a program with greater resources and greater visibility.

[95.](#) The Commerce Department is already required to help develop markets for recovered materials. 42 U.S.C. §§ 6953, 6955 (1982), ELR STAT. RCRA 031.

[96.](#) This would extend and require more complete implementation of a provision already in RCRA. 42 U.S.C. § 6952, ELR STAT. RCRA 031.

[97.](#) 42 U.S.C. § 11023, ELR STAT. EPCRA 006. EPA has proposed a somewhat similar notice requirement for industrial waste. *See* 53 Fed. Reg. 33314, 33398 (Aug. 30, 1988).

Pennsylvania's proposed industrial waste regulations contain a similar notice requirement. Proposed 25 Pa. Code § 287.111, 20 Pa. Bull. 1134.

[98.](#) RCRA already contains a similar requirement for hazardous waste. 42 U.S.C. § 6922(a)(6). ELR STAT. RCRA 012.

[99.](#) EPA does not need legislation to do this, so it could be done fairly quickly. Such information could greatly help states in writing regulations or permits, and could be adapted or modified based on local conditions and experience. Information developed in state programs, in turn, could be transmitted to EPA for possible incorporation into the guidelines or manuals.

[100.](#) 30 U.S.C. §§ 1252(c), 1265, ELR STAT. SMCRA 020, 033. The interim program contained eight performance standards from a longer list of performance standards required in the permanent program, and it assisted in the transition to a permanent program. This interim program differs from the interim status program under Subtitle C because a hazardous waste treatment, storage, or disposal facility operator could qualify for interim status simply by filing a preliminary notification and a permit application. 42 U.S.C. § 6925(e)(1), ELR STAT. RCRA 017.

[101.](#) E.g., GENERAL ACCOUNTING OFFICE, HAZARDOUS WASTE: NEW APPROACH NEEDED TO MANAGE THE RESOURCE CONSERVATION AND RECOVERY ACT (1988).

[102.](#) *See* NONHAZARDOUS WASTE, *supra* note 16. The Office of Technology Assessment is scheduled to issue a report on industrial waste later this year.

[103.](#) *See* LANDY ET AL., *supra* note 29.

[104.](#) *Id.* at 288.

[105.](#) *Id.* at 290-97. A third question is what compensation should various people receive for environmental insults or dislocations from environmental protection efforts. *Id.* at 294.

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