Environmental and Energy Study Institute

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March 10, 1987

Susan Fry
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Dear Susan:

Please find enclosed a draft report on the findings and recommendations of our hazardous waste management project. This report was the subject of our most recent advisory panel meeting in January and generated spirited discussion.

Your comments on the issues identified in the paper, and thoughts on how best to address them, will help us raise these critical implementation issues in a productive manner. It would be most useful if we could receive your comments by March 27.

Also, as mentioned in the report, we are in the process of developing a list of the information that would be needed to assess whether there is a capacity problem, and the dimensions of that problem. We will be sending the list to you in early April to get your input.

Please feel free to call if you have any questions. We appreciate your taking the time to give us the benefit of your ideas.

Sincerely,

Kate Probst
Project Director

Ken Murphy
Executive Director

Enclosure

S T A F F D R A F T

THE HAZARDOUS WASTE LAND DISPOSAL RESTRICTIONS: MAKING THEM WORK

by Kate Probst

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I. INTRODUCTION

The Institute launched a Hazardous Waste Management Policy Project in April 1986. The primary objectives were to identify the obstacles to alternative hazardous waste treatment technologies and to develop policy options to encourage development and use of these alternatives. The need to develop safer hazardous waste management practices has taken on added urgency: deadlines for banning hazardous waste land disposal begin taking effect in the late 1980s, and the 1989 deadline for states to assure the availability of adequate waste treatment capacity, or lose Superfund money for remedial action, is drawing near.

We began our work by investigating the barriers to the entry of new treatment technologies. However, it quickly became clear that what generators, commercial treatment firms, state agencies and many citizen groups alike are most concerned about is whether there will be enough new capacity from existing technologies available to implement the land disposal restrictions, as mandated by the 1984 amendments to the Resource, Conservation and Recovery Act (RCRA). Their "worst fear" is that there will not be enough strides in source reduction and recycling, nor needed increases in treatment capacity. If this is the case, the 1984 amendments will have failed, and the land disposal of untreated wastes will, of necessity, continue. The environmental result is continued threats to groundwater. The legislative result could easily be another set of major statutory amendments in 1988, creating a never-ending roller-coaster of regulatory change.

The 1984 amendments to RCRA set in motion a complex set of requirements aimed at improving the way hazardous wastes are

managed in this country and thus reducing threats to ground, and surface water. The most far-reaching provisions require the Environmental Protection Agency (EPA) to ban continued land disposal of untreated wastes where better alternatives exist. The amendments set a detailed schedule for when EPA must make decisions about banning different categories of wastes from land disposal. Congress recognized that lack of alternative capacity might present a barrier to shifting away from land disposal and allowed EPA to grant national and case-by-case variances when certain criteria are met. Increased source reduction and recycling and adequate alternative treatment capacity are the key to the successful implementation of the entire land disposal restrictions program.

The Institute's hazardous waste project is aimed at stimulating frank discussion of the controversial issues surrounding the implementation of the land disposal restrictions, to identify some of the policy implications if these issues are not addressed and to recommend steps that could be taken to develop workable solutions.

This report focuses primarily on one aspect of the land disposal restrictions' success: will there be adequate incineration capacity for organic wastes to assure the successful implementation of the land disposal restrictions? We have chosen to focus the report on incineration capacity for three reasons. First, we found in our interviews that it is the issue that is most on everyone's mind -- regardless of whether they are "for or against" incineration. Second, incineration is the only readily available treatment technology for organic wastes (other than wastewater) -- which, precisely because there is a ready alternative will be the waste stream most immediately affected by the land disposal restrictions. Third, by focusing on incineration capacity, we can clarify other key issues, such as how much source reduction can reasonably be expected and whether

the permitting system can respond to needed capacity in a timely manner.

The findings, recommendations and conclusions in this paper are based on 78 structured interviews conducted over the past 10 months with representatives of chemical companies; other waste generators; waste treatment and disposal firms; state and federal regulatory agencies; environmental; public interest and trade associations; and other experts on hazardous waste management. We selected people and organizations to be interviewed to be representative of the different interests involved in hazardous waste management. The interviews do not, however, comprise a statistically significant sample.

This report also is based on numerous less-structured discussions and synthesizes the work of many other organizations at the state and local level, as well as by federal agencies. At the national level, the General Accounting Office, the Congressional Office of Technology Assessment, the Congressional Budget Office, the U.S. Environmental Protection Agency and, most recently, the Congressional Research Service, have issued reports that address different aspects of the federal and state hazardous waste programs and bring together much of the available data on these issues.

The project began with a "scoping" phase to define the range of obstacles to alternative technologies and the establishment of an advisory panel which included corporate and environmental representatives, federal and state government officials and congressional leaders (see appendix). Based on the scoping phase and guidance from the advisory panel, we decided to undertake issue and policy analysis, rather than "fact-finding," and to focus specifically on the permitting process as a barrier to alternative technologies and options for improvement. We carried out this work by conducting a case study in the Midwest and

interviews with a broad range of people throughout the country involved in the permitting process.

Although the primary focus of this report is on incineration capacity for organic wastes, there are two other issues that are central to the successful implementation of the land disposal restrictions and to increased environmental protection. First, there is a real question whether acceptable treatment methods exist for inorganic wastes and for the residuals of wastewater treatment and incineration. Also, because the only currently available treatment methods for inorganics and the residuals of other treatment technologies involve some kind of treatment to "stabilize" the waste and then landfilling, and because stabilization usually increases volume, it is possible that there will not be adequate land disposal capacity. Second, there is reason to be concerned that the current regulatory structure and the barriers to new technologies may result in freezing in current technologies. These issues are addressed briefly in the final section of this report.

This report is being distributed for review to all those individuals interviewed for the project. The final draft will reflect their comments, as well as input of the advisory panel.

II. ADEQUATE ALTERNATIVE CAPACITY: WHAT ARE THE "ALTERNATIVES?" WHAT IS "ADEQUATE" CAPACITY?

If the critical question is whether adequate alternative capacity exists, or will exist, in time for implementation of the land disposal restrictions, the answer lies in defining what constitutes these "alternatives," and what constitutes "adequate" alternative capacity.

It is unclear whether the 1984 amendments were intended to a) force the shift of wastes from land disposal to existing alternative technologies, such as incineration and other currently available treatment processes, b) force the development of innovative technologies, or c) both. It is also unclear what role increased source reduction and recycling were expected to play in the overall scheme of hazardous waste management.

The result of the uncertainty over exactly what Congress intended is that different groups -- each proclaiming vociferously that they are implementing the law -- are proponents of quite different solutions. Thus, some groups advocate that any capacity shortfall that does exist should be met through source reduction, while others argue that the amendments specifically allow for increased use of treatment technologies, and that increased reliance on incineration is the solution.

<u>For now, the alternatives are limited to the current generation of technologies.</u>

At a very basic level, there are three categories of hazardous wastes (as regulated under RCRA), each amenable to different kinds of treatment technologies. Currently, wastewater can undergo wastewater treatment. Organic wastes for which

wastewater treatment is inappropriate can be burned in boilers or incinerators. Inorganic wastes, and the residuals produced from wastewater treatment and burning organic wastes, can only be land disposed. The land disposal restrictions probably will require some form of stabilization before the land disposal of these wastes. In addition to wastes specifically regulated under RCRA, there are other wastes that must be managed in accordance with the land disposal restrictions. These include wastes from Superfund cleanups; wastes from RCRA corrective action cleanups; and polychlorinated biphenyols, as regulated under the Toxic Substances Control Act (TSCA).

The current generation of treatment technologies--incineration, burning in industrial boilers, wastewater treatment and other existing methods of physical, chemical and biological treatment -- offer the only means of complying with the land disposal restrictions. The reason is time. The time involved in getting a permit for, and siting and building, a new facility, or an addition to an existing facility, means that only those companies that have already filed for a permit have any chance of having new capacity available before the land disposal restrictions are scheduled to take effect (November 1986-November 1990).

Until quite recently, there have not been permitting regulations for new technologies. New treatment technologies are mostly untried on hazardous wastes. They will not be available for full-scale use until after the initial land disposal restriction deadlines. Moreover, most of the new technologies are both more expensive and more risky from both an environmental and financial standpoint than existing technologies, providing little incentive for companies to choose them. Thus, generators and commercial waste management companies faced with deciding what treatment facilities to build now, in order to have capacity three-five years from now, have no choice but to chose today's

technologies.

We found widespread agreement among those interviewed that "alternatives" can only mean existing alternatives to land disposal. Yet, we heard repeatedly from waste generators that they were delaying making decisions about how they would comply with the land disposal restrictions, to see what treatment standards are specified by EPA. Because of the time involved to get a facility permitted and built, delay now may well result in insufficient capacity -- further delaying the restrictions. While the decision to delay investment in on-site incinerators, for example, may be in a company's self-interest, in that it delays expenditure, it also contributes to a potential shortage of capacity and may serve to delay national implementation of the land disposal restrictions.

The bottom line is that even though the 1984 amendments were carefully crafted to create certainty, they have not resulted in government or industry taking the steps needed to ensure their success.

How much capacity is enough?

How much alternative capacity is enough to be able to fully and successfully implement the land disposal restrictions? This question has received little attention. Yet, it is crucial, because the answer subsumes a number of important policy issues: How much recycling will/should take place in the next five years? How much source reduction? What technologies are acceptable?

A proposal to build a new incinerator is controversial. Besides community concern about toxic air emissions and the storage and transportation of wastes, increases in capacity may result in less pressure on generators to reduce and recycle wastes. Some of the generators we spoke to said their commitment

to source reduction would be unaffected by increased incineration capacity; other generators are concerned that top corporate management will not focus on reduction and recycling unless there are very real external pressures to do so.

The land disposal restriction regulations that EPA has issued and proposed do not take reduction and recycling into account in arriving at decisions whether to require immediate compliance with the restrictions or extend them up to the two-years allowed in the law. To date, EPA has made no effort to develop criteria for defining how much capacity is needed to make the determination that "adequate alternative capacity" exists for the purpose of implementing the land disposal restrictions. By defining, or not defining, what constitutes adequate capacity, national policy is being set on source reduction, recycling and waste treatment. The absence of clear policy has resulted in confusion, on the part of industry, the public and state agencies charged with implementing the restrictions. This confusion has very real consequences.

Some large generators that are considering building on-site incinerators told us that they will not go ahead with these plans until EPA policy is clear and until it is clear that they will not be able to comply with the restrictions by relying on commercial facilities. This conservative attitude, although understandable, has the effect of delaying new capacity and makes it more likely that there will not be adequate alternative capacity to implement the land disposal restrictions.

Depending on the assumptions made about what progress can be achieved in reducing and recycling wastes, the amount of incineration capacity "needed" to make the land disposal restrictions work could vary greatly. For example, if it is reasonable to assume that all types of wastes can be reduced by 50 percent, then it is probable there is no need for additional

incineration capacity. If, on the other hand, only liquid organic wastes can be reduced by 50 percent, then the most intractable problem for the future is probably how to treat and dispose of residuals and inorganic wastes. If the most optimistic estimate for how much waste can be reduced is 10 percent, the issues again shift. These different estimates of what is possible, much less what can reasonably be expected over the next few years, have a dramatic impact on estimates of needed incineration, treatment and landfill capacity.

III. THE DEADLINE SETTING

In addition to the uncertainty about what constitutes "adequate alternative capacity" the deadlines in the amendments exacerbate the situation. The amendments include deadlines for the land disposal restrictions, an allowance for two-year national waivers for the restrictions and, finally, deadlines for issuing land disposal, incineration and treatment permits. Regardless of whether you assume that two-year national waivers will always be granted, the deadlines for issuing permits for the very practices the restrictions are supposed to encourage -- incineration and treatment -- lag behind the effective date for the restrictions. In fact, the first permit deadline is for land disposal facilities. While this makes sense, given concern over groundwater contamination, it sets up an unworkable situation.

The multiple deadlines in the statute present conflicting views of what Congressional priorities are. Is it banning the wastes from land disposal or assuring there are available facilities to treat them?

Most of the people we interviewed -- regardless of their affiliation -- believe it will not be possible for states and EPA to issue all incineration permits by the statutory deadline. Even if the incineration permits are issued by the deadline, it still takes time to construct new facilities and expand existing ones -- thus pushing the availability of additional capacity further away.

The 1986 Superfund amendments contain still another deadline, designed to put pressure on states to assess how much treatment and disposal capacity will be needed to dispose of all wastes generated in the state, including wastes resulting from

Superfund clean-ups. This amendment, called the "siting" amendment," requires states to provide assurances to EPA of the availability of hazardous waste treatment and disposal facilities with adequate capacity to accommodate wastes expected to be generated for the next 20 years by October 1989, or lose their remedial action funds under Superfund. If this 1989 deadline is a reasonable one, it means states will not have the information needed to support siting new facilities until after some of the land disposal restrictions have come due.

Because the deadlines set up an impossible situation, generators may well just ignore the deadlines, saying they cannot possibly comply. If this is the case, the result may be that no progress will be made between 1984 and 1988 to shift away from land disposal of untreated wastes.

IV. CONCLUSIONS AND RECOMMENDATIONS

Our Midwestern case study was conducted to give us a better sense of the views of those people "on the front line," who are really responsible for complying with the law. None of the people we talked to in the Midwest believe there will be adequate incineration capacity to implement the land disposal restrictions as scheduled. In fact, of the 78 people interviewed, only a handful believe that there will not be a major incineration capacity crisis. The general consensus is that neither Congress nor EPA will "act" until there is a bona fide crisis, even though many believe a crisis could be avoided. We could find no indication that EPA is looking, or plans to look, at what is being done or can be done to ensure there is adequate alternative capacity to implement the land disposal restrictions. This conclusion also was reached in a recent Congressional Research Service report.

One of our most crucial conclusions is that the widespread perception that there is a capacity crisis is influencing peoples' behavior, leading them to take actions that contribute to a capacity shortfall, even though there is no data to support whether there is a capacity shortfall or not. For example, some waste generators told us there was no point in building incinerators now, because it is not clear whether the land disposal restrictions will be implemented. While this may be in companies' self-interest, the effect is to make it more likely there will be insufficient capacity. Government agencies, by not moving aggressively to process permits that would result in additional incineration capacity, are not giving the impression that they are trying to ensure that adequate capacity is available to make the land disposal restrictions work.

Nevertheless, there is still time to take steps to document whether there is, or is not, a shortage of incineration capacity. If there is not one, there is time to change current perceptions. And if there is a shortage, there is time to identify why, and to develop a strategy to deal with the capacity problem before the land disposal restrictions self-destruct.

The first step is for EPA to quickly document whether there is, or is not, a capacity problem.

EPA has initiated a major capacity survey, but the results will not be available for at least a year. The agency also plans to improve the information submitted biennially by all generators, but again this information is not expected to be available until 1988 or 1989. We believe that it is possible to get some useful estimates of the factors affecting the capacity situation quickly that would enable practical decisions to be made, by Congress and EPA, about what steps need to be taken to make the land disposal restrictions a success.

This is not an impossible task, as long as the goal is to get a view of the "big picture." The objective of this analysis should not be a detailed picture of each waste stream, but instead to estimate how much waste is being generated, how it is managed, how waste management practices will shift to comply with the land ban restrictions, what new incineration capacity is coming on line and when, and how much source reduction and recycling will occur. With these estimates, a determination could be made that:

* There is no capacity problem.
* Estimates of demand and supply are very close, making it unclear if there will be a capacity problem.
* Estimates of demand far outweigh anticipated capacity,

meaning there will be a "crisis" if the assumptions and estimates of the analysis are correct.

As part of this project, the Institute is compiling a list of the information needed to make this determination.*

Estimates can be made, for example, of what incineration capacity is in the pipeline, and when it will come on-line assuming all permits that have been submitted are approved and all facilities built. It also would be possible to identify what plans large generators and commercial firms have for building additional incinerators in the next five years and make similar estimates for the most optimistic estimate of when the capacity would come on-line. With a series of "optimistic" estimates, a determination can be made whether there will be a capacity shortfall if everything goes perfectly, or whether, even if the most optimistic scenario occurs, there will be a major shortfall.

Once a determination is made that one of the above hypotheses is likely, it then will be possible to develop a coherent national strategy to make the land disposal restrictions work.

<u>If there is not a capacity shortfall ...</u>

If, upon analysis, it turns out that there will not be a capacity shortfall, then EPA needs to get this message out quickly and "loud and clear." This is critical because, as mentioned earlier, the fact that many believe there will be a shortfall is influencing their behavior has direct implications on whether there will be adequate capacity. If generators and state agencies were put on notice that the law will be implemented as written, it would result in the redirection of

*We will be distributing this soon.

their efforts to obtain needed capacity, achieve more progress in source reduction and recycling, and issue needed permits expeditiously.

EPA also could develop an enforcement strategy to make clear to generators that they will be held responsible for complying with the land disposal restrictions.

If it is a close call ...

If analysis suggests that there might be a capacity shortfall, the next step is to identify whether administrative steps could be taken to avoid it. There are a two major areas that could be looked at: how much incineration capacity is "in the pipeline" and what reductions in the waste to be managed could be achieved by more aggressive source reduction and recycling. One action EPA and the states could take, for example, would be to give priority to issuing incinerator permit applications that would result in increased capacity.

The question of what additional incineration capacity is "in process" deserves greater attention by EPA and the states, because it potentially offers a "solution" to the capacity shortfall and because one of the most often-cited assertions about why there is not enough incineration capacity is that EPA and states are issuing permits so slowly. There is no data on what additional capacity in fact would result if all the 235 incinerator "Part B" permit applications were approved and built. It is clear that there has been no effort to find out if issuing the incinerator permits would result in increasing incineration capacity, and if so, by how much. Also, it is clear that no concrete strategy exists for issuing the 235 incinerator permits in time to meet the land disposal restriction deadlines (even if two-year national variances are routinely granted), even though EPA's "California list" proposal states there is not adequate

capacity to incinerate those wastes where incineration is the "best demonstrated available treatment" (BDAT) technology.

If there appears to be an insurmountable capacity shortfall...

If there appears to be a major gap between expected waste generation and expected increases in source reduction, recycling and incineration capacity, Congress will have to clarify the national policy. Some will argue that the law makes it clear that all those firms that can not comply should go out of business, while others will argue this was never Congress' intent, and EPA and the states will be left holding the bag.

Congress then will face the difficult choice of sticking to the statute as written, extending the deadlines in a way to keep the pressure on for source reduction or taking some other action.

Unless steps are taken now to identify whether there is a shortage of incineration capacity (or why there is that perception) and what can be done about it, there is a real danger that when Congress revisits RCRA in 1988, the nation will be facing the same capacity shortfall it faces today.

What happens if there is not adequate alternative capacity "in time?"

There are several possible scenarios that could result if there is not adequate alternative capacity to implement the land disposal restrictions. These include:

o EPA could initiate enforcement proceedings against all generators that do not comply with the land disposal restrictions. This would probably result in closing many businesses, especially small and mid-sized firms.

o EPA could condone widespread use of case-by-case

variances, to give generators another year or two to comply with the restrictions.

o EPA could decide not to enforce the deadlines, on the grounds that they cannot be met.

o Congress could extend the deadlines.

All of these scenarios would only result in further delay in implementing the amendments, thus leading to greater doubt as to whether the land disposal restriction provisions should be taken seriously. This would greatly undermine the credibility of EPA and would result in future statutory deadlines being taken with more than a grain of salt. More importantly, none of these scenarios would in any way result in actions being taken to resolve the problem, to ensure that the land disposal restrictions work.

What many of the generators, state agency representatives and commercial management firms fear most is that, in response to failed implementation of the 1984 amendments, a new round of amendments will be promulgated in 1988, and the entire regulatory system will go through another wrenching change, with no chance of success, and little increase in environmental protection having been achieved. Unfortunately, some of the people interviewed at EPA headquarters seem to have the view that the agency will be blamed no matter what happens, so why bother.

V. OTHER ISSUES

This section addresses two other issues central to implementation of the land disposal restrictions and to increased environmental protection. First, are there acceptable treatment methods for the residuals of wastewater treatment and incineration, as well as those wastes which cannot be incinerated, and will there be adequate land disposal capacity for all these wastes? Second, will reliance on incineration and other currently available technologies "freeze" development of new, perhaps safer, technologies, delaying them for many years.

Alternatives for inorganics and residuals: are there any good options?

There is general agreement that inorganic wastes and residuals from other treatment methods should be stabilized, in some way, and then be land disposed. There is little actual data on how good, or how long-lasting, many of the stabilization methods are. There is little attention being paid to the possibility that, because these wastes will be land disposed, additional land disposal capacity may be needed in the future--hardly a popular idea. Adding to the chance of a crunch, most existing stabilization methods increase the volume of the waste that must be landfilled.

More work needs to be done to:

* Test the effectiveness of various stabilization techniques.
* Assess whether the effectiveness of different stabilization techniques relates to whether they are used at a brand new landfill, at a new cell in an

existing landfill, or in a landfill cell along with untreated wastes.

* Estimate the future demand for landfills.
* Educate the public about the effectiveness of different waste stabilization techniques and the future need for landfills.

Barriers to emerging treatment technologies

We found that emerging treatment technologies face all the same barriers that existing technologies do, and then some. While there is some agreement on the barriers, there is much less agreement on possible solutions. They are either controversial, would require additional resources for EPA and the states, or require basic management changes at EPA and the states.

There is also an underlying concern that the pressure to implement the land disposal restrictions, and the concurrent investment in existing technologies, may freeze existing technologies -- and shut out new, perhaps safer, methods. For example, it is clear that incineration is going to be the predominant treatment method for organic wastes, yet there is already great public resistance to this "alternative" technology because of fear of toxic air emissions.

We did find that the barriers to new treatment technologies seem to be slightly less for Superfund cleanups and for PCB destruction technologies, which are regulated under the Toxic Substances Control Act (TSCA). In fact, we found that most of the companies trying to sell new treatment methods are doing so under these two programs and staying away from RCRA, with its more difficult permitting process. Also, companies have found slightly less public resistance to trying new technologies for Superfund and PCB wastes, perhaps in part due to the fact that there are no required public hearings for siting facilities and

disposing of wastes in these two programs.

The additional barriers new technologies face include:

* No performance standards against which to judge them.
* No real performance data because, under the current regulatory structure, you cannot test a new technology on a bona fide hazardous waste.
* Distrust by the public, since there is no data on how they perform.
* Lack of expertise on the part of permit writers to judge the performance of new technologies.

Aside from the familiar problems with state and EPA resources and technical expertise, the central issue comes down to trading off trying something new that may be safer against the risk that it will not be safer. Some argue that Congress, by including in the RCRA amendments a provision for research permits, made the policy decision to allow the testing of untried technologies. Others argue that you should not take unknown risks. These two views do not leave a lot of room for compromise.

There are two EPA programs that attempt to deal with new technologies: the Superfund Innovative Technology (SITE) program and the Research, Demonstration and Development (RD&D) program under RCRA.

There is an expectation that the SITE program may actually provide a vehicle for field-testing new treatment methods. However, there is widespread concern that the RCRA RD&D permit program does not actually offer many benefits over the regular permitting process. It is fair to say, however, that it may be too early to judge the effectiveness of either of these programs.

The possibility that the existing regulatory structure will freeze in current technologies may be real, if the experience of other environmental programs is any example. To solve this problem, Congress may well have to address more directly the trade-offs in testing new technologies or firmly support EPA and state efforts to issue RD&D permits to new treatment technologies.

HAZARDOUS WASTE MANAGEMENT POLICY PROJECT
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