

The sensitive art of siting treatment facilities

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Siting of waste treatment facilities includes political, environmental, and engineering criteria. Industry and government are rewriting regulatory guidelines, defining acceptable land areas, and listing specific site criteria in order to establish safer waste facility sites.

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Finding sites for facilities that treat, store, or dispose of hazardous wastes has become one of the most controversial issues facing U.S. regulators, industry, and the public. One reason is that time has shown us that some disposal methods are not safe.

Industry generates approximately 275 million metric tons of hazardous waste each year, according to a 1982 estimate by the Office of Technology Assessment. In the past, both industry and government relied heavily on land disposal. However, a 1982 study by Peter Montague, a Princeton University researcher, revealed that all landfills, regardless of the type of containment and liner system used, eventually will leak. Further, a July 1983 study commissioned by EPA determined that not enough is known about the interaction between liners and certain hazardous wastes to warrant confidence in landfilling beyond the near future.

According to EPA, as many as 17,000

to 22,000 hazardous waste sites in this country will need to be cleaned up in the next decade because they threaten human health and the environment. Cleanup at many of these sites may include excavation of buried wastes for treatment and disposal elsewhere.

It is clear that industry, government, and the public must work together to develop new means to handle — safely — both old and new wastes. Without safe state-of-the-art processing facilities strategically sited near industrial regions, hazard wastes will continue to be stored, landfilled, or simply dumped in ways that will lead to further deterioration of the environment.

Siting regulations

On the Federal level, the 1976 Resource Conservation and Recovery Act (RCRA) regulates the treatment, storage, and disposal of hazardous wastes. Under the Act, in July 1982 EPA promulgated standards for land disposal. However, RCRA controls facility siting only to the extent that EPA approves or denies facility permit applications based on technical soundness. It does not include criteria for locating facilities, except for certain floodplain and seismic restrictions.

EPA currently is developing location standards. While the actual standards

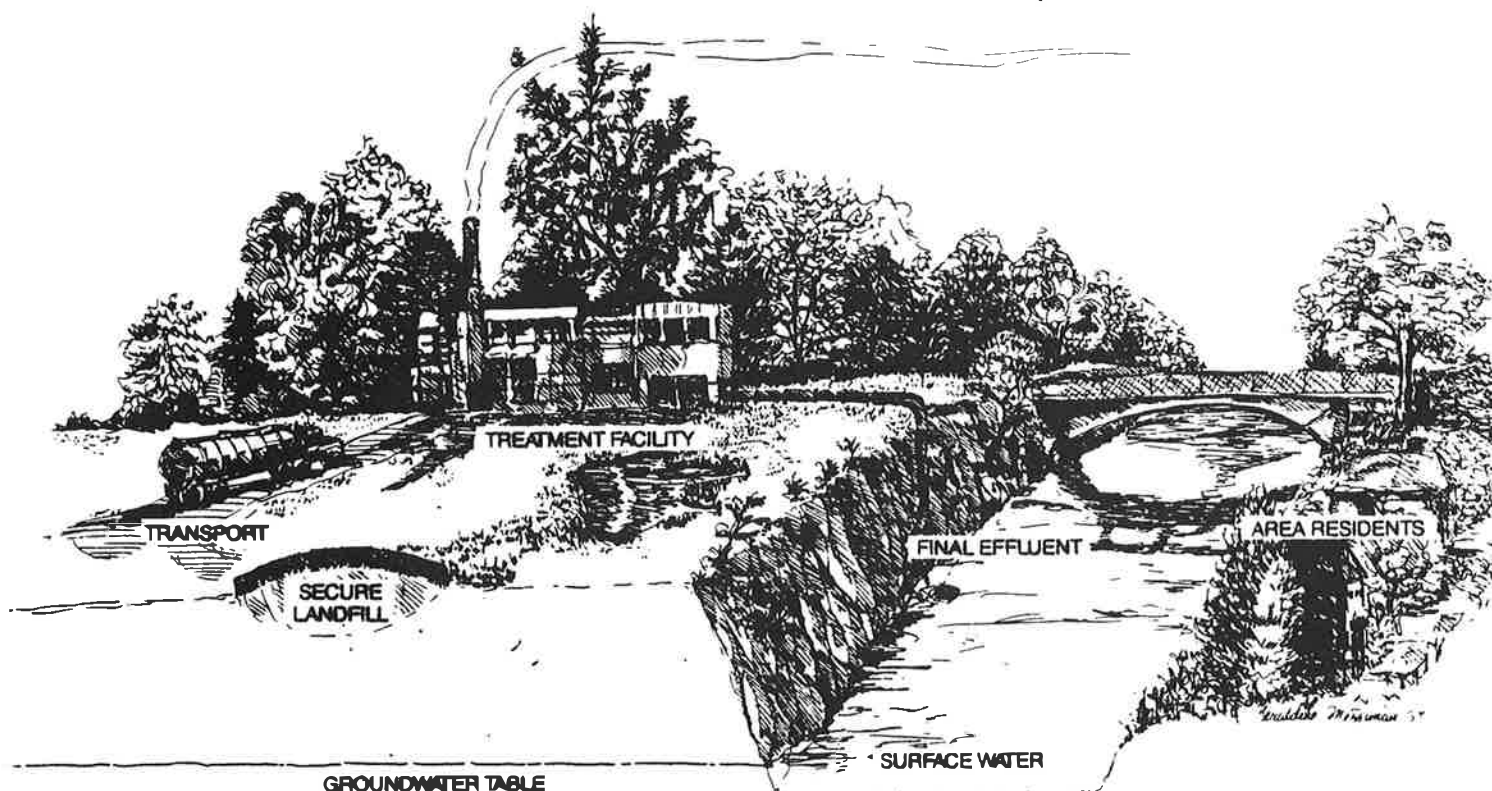


will not be ready to implement until September 1986 at the earliest, the agency was expected to issue guidelines in September 1984. According to Ken Schuster of EPA's Office of Solid Waste, the guidelines will serve as the basis for the eventual standards and as criteria to judge the adequacy of RCRA permit applications until the final standards are issued.

The guidelines and standards will address:

- Unacceptable siting areas. These may include areas where groundwater flow is uncertain or undeterminable, which would preclude the development of effective groundwater monitoring criteria.
- Recharge areas. These may include areas where water flows into major aquifers. Siting in such areas probably will be prohibited.
- Potentially acceptable areas. Schuster says that EPA aims to describe certain types of environmental settings that it may consider appropriate for a hazardous waste management facility. It will attempt to evaluate the major factors of a potential site, such as geological conditions or permeability and how they would be affected by a facility. It then will assign values to these factors and rank them by acceptability or unacceptability scores.

Potential Environmental Impacts



*The road to potential environmental impacts:
From transport, treatment facility, and landfill to the
air, surface water, and groundwater table.*

Once EPA issues final standards, states can issue their own standards, which must be at least as stringent as the agency's, or they can let the agency enforce the national standards. However, EPA prefers that states develop and manage their own programs. In fact, on the state level, at least 25 states currently have their own statutes governing siting. These laws vary in their siting process requirements, location criteria, preemption over local rules, and incentives offered to host communities. Other states have taken a passive role, waiting for developers to propose facilities at locations they have chosen. Gregor McGregor, of McGregor & Associates, a Boston law firm that specializes in environmental and municipal issues, suggests that states probably will have greater siting success if they determine where facilities are needed and then encourage qualified developers to operate facilities at these locations. State officials find themselves in the unenviable position of trying to encourage industrial development by ensuring that their states can handle wastes, while trying to

satisfy local constituents by not threatening them with the prospect of hazardous waste management facilities.

On local levels, siting often is complicated by local zoning laws and home rule powers. An important issue to consider is whether state laws override municipal land use bylaws and zoning ordinances. State siting laws sometimes do not address the issue of preemption and therefore invite litigation between municipalities and states. On the other hand, local bylaws can be drafted to set objective site standards for industrial and commercial uses, thereby ensuring local control over the criteria governing facilities, but not seeking to ban them outright.

General concerns

The potential impact of a hazardous waste management facility on human health and the environment depends on various factors. They include:

- Waste characteristics.
- Waste management methods.
- Design and operation of the facility.

- The location of the facility in relation to population, surface water, groundwater, and sensitive environmental areas.
- Site hydrology, geology, topography, and climate.
- Mitigation methods.
- Other paths for pollutants to enter the environment.

Before allowing a state or developer to site a facility in their community, citizens want proof that these factors have been addressed thoroughly. They also want proof that their community is the best location for a facility, that the developer is trustworthy; and that the facility will operate safely. But even if such assurance is provided, the siting process remains more political and emotional than technical. Today no one wants hazardous wastes in his "back yard." The question becomes: How can government and industry gain the trust of the public and successfully site a waste management facility?

Choosing suitable land areas

Developing generic siting standards

that provide a basis on which to identify geographic areas that are acceptable, have potential, or are unacceptable may be an appropriate beginning for a fair and effective siting process. But before these standards can be developed, a state must evaluate available areas that have potential. This is an expensive, time consuming process.

Engineering firms play an important role in these early stages of the siting process. To help a state choose the most acceptable areas, the firms would study the hydrogeological factors throughout the state, including:

- Permeability, porosity, and density of soil.
- Depth to, and type of, bedrock.
- Depth to seasonally high groundwater.
- Watershed significance.
- Soil/rock chemistry.
- Settlement characteristics.

To assist New York State in evaluating its needs and possible facility locations, in 1980 Camp Dresser & McKee Inc. conducted surveys of the state's hazardous waste generation and management

practices and formulated specific alternative management strategies, including the conceptual design of a state-wide treatment and disposal facility. In addition to hydrogeological factors, the environmental study for the New York Department of Environmental Conservation reviewed:

- Existing conditions in the state, including hazardous waste management data, the limitations and needs of existing facilities, status of planned facilities, and how hazardous waste generation was distributed.
- Alternatives for siting facilities. Based on generation distribution, CDM reviewed the possibilities for siting one central facility to handle all of the waste in the state, a regional facility for each half of the state, or four regional facilities located in the four areas of heaviest waste generation.
- Siting considerations. Finally, specific factors that affect the successful siting and operation of a hazardous waste management

facility were reviewed. These included how effectively the state enforced its environmental laws; the impacts of accepting out-of-state waste; the effectiveness of source reduction efforts by industry; public education in management of hazardous wastes; the market demand for resource recovery; and the question of who is liable for wastes at a facility — the site owner, facility operator, or waste generator.

Specific criteria

After a state has evaluated its needs and the availability of acceptable locations, a potential developer must support any proposal with site-specific and process-specific criteria. But specific criteria will not ensure that residents of a targeted community will become willing hosts.

According to John Schofield, senior vice president of IT Corp., Wilmington, California, "Engineering details are not the main factor. A community targeted to host a facility often will view the intention to treat hazardous wastes as a problem, not a solution to a problem."

In the experience of Jim Hume, vice president of Solvent Recovery Systems Inc., Linden, New Jersey, if a developer can sell a community on the validity of a proposal and assure the people that the proposal's criteria will be met, public opposition should be minimal. However, the pitfall is that the siting process is essentially a political process. Even so, he says, the bottom line of any proposal is the engineering criteria; having criteria doesn't guarantee you will get a facility, but not having criteria guarantees you will not.

One state that has developed specific location standards is New Jersey, which has a great deal of land underlain by sandy soils, making groundwater flow a concern. However, the state learned during public meetings and hearings that citizens' primary concern was proximity of facilities to residential areas. As a result, New Jersey developed 42 specific location criteria, broken down under several main environmental factors, including:

- Proximity to population. Storage and incineration facilities are prohibited within one-half mile of any structure occupied or inhabited by people for

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more than 12 hours a day or by anyone under the age of 18 for more than two hours a day. In addition, land disposal or impoundment facilities are prohibited within 2000' of such structures. These criteria apply not only to residences but also to schools, hospitals, and nursing homes, among others.

- Environmentally sensitive areas. All facilities are prohibited in wetlands areas, habitats supporting endangered species, and state-designated wild and scenic river corridors.
- Structural stability. All facilities are prohibited in flood hazard areas adjacent to streams or rivers, and in certain coastal flood hazard areas at elevations less than 12' above sea level. All facilities are prohibited in areas underlain by cavernous bedrock.
- All facilities are prohibited in the upstream portion of watershed areas draining into reservoirs and in certain areas of high quality waters, as determined by the state.
- Groundwater. According to Rick Gimello, director of the state's Hazardous Waste Facility Siting Commission, establishing criteria for protecting groundwater was a complex task. The state developed four main criteria:
 - Regarding hydrogeologic systems, new facilities may be sited only in areas where groundwater in the uppermost saturated layer flows parallel to or upwards toward the water table.
 - Regarding flow time, land disposal or impoundment facilities are prohibited in areas where underlying groundwater travels to the site boundary in less than 10 years.
 - Regarding wells, land facilities are prohibited within one mile of a water supply well or well field producing more than 100,000 gallons a day.
 - Regarding groundwater depth, partially in-ground land facilities are prohibited in areas where the depth to seasonally high water level is within five feet of the containment surface. Above-ground facilities are prohibited where the

depth of seasonally high groundwater is within one foot of the ground surface.

Role of the public

Once it is established that a site is environmentally acceptable, the siting process becomes more complicated, as the developer must look at whether or not a proposal is socially acceptable and politically feasible. IT's Schofield says that the first thing a developer must look at is whether or not he thinks a facility *can* be sited. Has the state resolved to site a facility? Can the developer withstand the inevitable legal onslaught? If so, he begins that marketing phase to see if the operation would be a viable business entity.

One of the most important parts of the siting process is public involvement. In New Jersey, environmental groups were involved in writing the siting law from start to finish. Further, the law gives the public a chance to review a developer's application and the state's site suitability study and to contest them at two adjudicatory hearings during the siting process. This involvement improves the chance that the state, a developer, and a community finally will agree on a proposal. A community still can file a civil suit against New Jersey if it opposes a proposal at the end of the siting process.

Economic factors

There are three basic concepts to hazardous waste management: large regional facilities that handle wastes from more than one state; decentralized facilities that handle wastes only from within a state or smaller area; and management on the site of the waste generator. Ideally, a facility should be sited near waste generating industries to cut down on the risks and costs that accompany transporting wastes long distances.

The concept of decentralized facilities can help minimize public opposition to siting. CDM has found that the biggest issue is convincing people that their town is the most suitable place for a facility. Residents may not be willing to support a facility that handles wastes from industries in other parts of the state or country. However, if a facility is located near or on the site of a company that contributes to the economic well-being of people in a town, opposition may

be reduced.

Another way to reduce local opposition is to offer financial incentives to the community. A major facility can bring in new revenue, as well as attract new industry to an area. In addition, localities often can collect taxes on a facility's gross receipts, waste tonnage handled, and the operating license. In New Jersey, an operator is required to pay five percent of its gross receipts to the host community to pay for training of local police, fire, and other emergency services needed to deal with hazardous waste accidents.

Facility operators might be required to compensate residents if it is determined that the presence of a facility reduces the value of residential property. In addition, since potential risk to health is of major concern to community residents, Federal and state laws that include provisions to compensate residents for illness or death from exposure to hazardous waste handled at a facility might make them less inclined to oppose a proposal.

The means justify the end

The need for comprehensive, safe hazardous waste management facilities is evident. Siting such facilities is a long process and all parties involved must accept a compromise. Residents of host communities must make sure their health and safety are not jeopardized, but they also should realize that proper management of hazardous wastes poses much less a threat than many current practices.

In addition, industrial firms should make known their disposal needs. According to McGregor, "If a facility meets a regional need, provides economic benefit to a town, and meets state standards and all legal and technical requirements, then we are on our way to siting the right facility by the right company in the right place, meeting documented waste management needs."

Consulting engineering firms can play a major role in the siting process, not only in design and implementation of a facility, but in setting standards and public policy. In particular, engineers can assess the need for facilities, establish site suitability, and formulate designs that inspire public confidence.