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Trash Disposal - 1971: Monroe County, New York

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by
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Introductory Note:

Few questions have so aroused the community as the recent discussion of how to dispose of trash, our only growing "resource". The issue is charged with emotion, as property owners fear lower standards of living as the trash moves next door. In order to clarify the issue from a technical point of view, R.C.S.I. has prepared this bulletin.

We are hampered in our judgment of landfills by the fact that there is no properly designed and maintained landfill in Monroe County. The very real fears of air pollution, water pollution and disease from a landfill are products of our experience with the dumps of this area.

Summary:

This guide is offered as a move toward a sound solution to our disposal problems.

1. We should today accept the sanitary landfill as a transitional method and insist upon proper design and maintenance; the landfill must not be allowed to become a dump. This transitional period should not extend beyond three-five years. During this time other methods must be developed; the sanitary landfill buys time for the development of more sensible methods, and, in doing so, replaces the intolerable open dump with a far less offensive disposal method. The sanitary landfill alone cannot be considered a satisfactory permanent solution.

2. The next step, commencing immediately, should be the inauguration of volume reduction methods. Chief among these is recycling. Separation of trash at the source (the householder) is feasible now and should be encouraged, by governmental subsidies to collection and transportation agencies, if necessary. Recycling is the key to the solution of our problem; at this stage recycling will not eliminate the landfill, but we must start the machinery which may finally accomplish that task.

3. During the landfill period, we should study, design, and build better disposal systems. Incinerators and pyrolysis units greatly reduce the volume of trash committed to the landfill. High cost and possible air pollution are drawbacks. We regard composting as a prime candidate for our final system, but the technology is not yet mature. Finally, we must develop a recycling industry to provide markets for recycled trash. Since paper is the major volume component of garbage, and since presently the markets for recycled paper are very poor, we believe a paper recycling industry (e.g., reclaimed newsprint) should be a focal point of the immediate community effort.

Recycling:

Some observations on recycling are included here for a clearer view of the subject of waste disposal.

Recycling is not only an ultimate answer to the waste problem, it is also a realistic short-range objective. The United States has recycled wastes extensively in the past. It can shift from the small scale effort of today to large scale recycling in the future. During the second world war, some 40% of our paper was recycled; we now recycle about 20%. We have, in times of war, crushed our cans and sent them back for recovery. In today's throw-away economy we have lost the art. Once we returned bottles to the store for refilling and the milkman picked up new empties for scores of additional trips to the dairy. Now we demand virgin containers for our food and, in the name of convenience, we throw away our resources.

Recycling efforts can be viewed as "small scale" or "large scale". Recently there has been an outburst of laudable campaigns by concerned people to recycle cans, bottles and paper. Nevertheless, large scale recycling will be required both to reduce the accumulating mountains of garbage engulfing cities, and to recover resources for further productive use.

Unfortunately, the kinds of recycling that can be implemented immediately can only alleviate the waste disposal problem a bit. Full scale recycling virtually to eliminate refuse is not technically possible today. The first question to be answered is, "What can be done with today's garbage after limited recycling?"

Incineration:

Another method of volume reduction before disposal is incineration. A properly designed and operated incinerator (e.g., the Montreal installation) might decrease the trash volume by 85%, making the landfill last five times as long. Moreover, the residue from the incinerator is much less objectionable in the landfill, with no odor or vermin problems. However, good incinerators are expensive. A capital investment cost of nearly $20,000 per ton capacity may be required. (The Montreal installation cost about $13,000 per ton, at 1200 ton capacity.) Air pollution is a real problem today, despite our technology in particulate recovery from stacks. Although an electrostatic precipitator might remove 95% of the particles, the precipitator cannot remove gases, such as hydrogen chloride, which may be offensive. Even scrubbers have not proved to be an effective means of removing all noxious gases, although studies do indicate that rubbish is very low in sulphur oxides, a primary group of contaminants. Water vapor plumes are cited as an unacceptable by-product in some installations. Tomorrow's air pollution standards will be even higher than today's. Because of the high costs, long design time, and possible air pollution hazards, we believe incineration, while possibly a longterm solution, does not represent a comprehensive answer to our immediate waste disposal problem.

Landfills in Perspective:

A properly designed and operated sanitary landfill appears to be the immediate answer for final trash disposal. Between the landfill and the source of trash, several volume reduction and recycling systems may be interposed; these cannot eliminate the landfill, but can only prolong its life and make its operation less subject to odors and vermin.

It appears, therefore, that until we learn to vaporize our waste completely back to its original elements (the government has reported longrange study of such a system!), we must accept the sanitary landfill for at least a portion of our trash. It becomes our immediate task to 1) study the disposal system to reduce as much as practical the volume committed to the landfill and 2) make the landfilling material as innocuous as possible to the eyes and noses of the public.

Landfill Operation:

A sanitary landfill is not an open dump; refuse is covered at least daily by a layer of clean soil. After operations each day, there should be no exposed garbage. The landfill design incorporates a knowledge of future use of the land, a knowledge of the geology of the area (in part to minimize ground water pollution), knowledge of climate and its influences, and a host of other considerations intended to minimize ecological hazards. The landfill is not allowed to become a public nuisance or danger. Wherever possible, previous zoning is applied, and adequate access is arranged to insure limited travel through residential areas. Each day's refuse is placed in a separate cell (or cells) with note made of depth (eight feet is recommended to alleviate surface cracking or settling). Fires are not allowed and sprinklers are used to control dust. In five years, the landfill, then covered by three feet of clean soil, may be used for parks, playgrounds and light airports; there may be an increase in worth of the land.

Environmental Economics:

The landfill is almost always the least expensive solution. Disposal charge may be $1.00 per ton (versus over $5.00 per ton for incineration). The per capita annual operating cost in an area the size of Monroe County may be as low as $1.00. In short, the sanitary landfill 1) is generally most economical if proper land is available, 2) is a final disposal method, 3) can be conceived in a short period of time, 4) handles all types of waste, and 5) can often reclaim unusable land.

We do not minimize the many problems associated with a sanitary landfill (methane formation, ground water seepage, long hauls often required). The most serious obstacle is simply that a sanitary landfill all too often is allowed to become a dump. Our first step in finding a solution to the disposal problem is to accept the necessity of the landfill (operating under the rules set down in part here) as the immediate solution. Secondly, we must demand that, once established, a true sanitary landfill not be allowed to become a dump such as we see in Monroe County now.

In the Appendix we have tried to list some of the most salient pros and cons but there are many others. Obviously, the landfill is not a panacea. We do not recommend its long term use. However, if strictly maintained at high standards, the landfill is a feasible solution to our immediate problems. Good landfills would be far superior to the dumps which Monroe County knows, and they would take us through a transitional period during the development of recycling methods and disposal technology.

Composting:

A partial alternative to landfilling may be composting. Today's industry is big brother to the back yard compost pile. In at least one industry* all types of trash are accepted; after grinding to a uniformly small particle size, and possibly an innoculation of bacteria, the ground garbage is set aside, often in closed silos, to decompose. The temperature is maintained at 170° in a typical process; under these conditions, the process takes ten to fourteen days. The end product resembles dried coffee grounds. It is odorless, free of pathenogenic bacteria and ready for use as clean fill. It generally has little value as fertilizer, but serves well as humus, in place of peat moss, for example. A municipal compost plant has operated from time to time for over ten years in Norman, Oklahoma. More recently, large scale composting started at Houston, Texas; Johnson City, Tennessee; and Kingston, Jamaica. Composting is technically feasible, but economics have forced the abandonment of most trials. Grinding alone has been offered recently. A corporation accepts trash, grinds it, converts it to clean fill, and removes it from the urban area, probably offering it for sale as landfill material. This corporation requires only a construction site and access roads.

We cannot at this time recommend composting, but we believe the technology should be explored further. At the least, composting can produce odor-free, disease-free, non-polluting landfill material.

REFERENCES

1. Sanitary Landfill Facts, Sory and Hickman, US Department of Health, Education and Welfare, Public Health Service Bulletin sw-4ts (1968).

2. Sanitary Landfill (a bulletin), New York State Department of Health (1969).

3. American City Magazine, 66, 98-99 (1951).

4. American City Magazine, 76, 98-103 (1961).

5. American City Magazine, 66, 104-105 (1951).

6. American City Magazine, 72, 115-117 (1957).

*Conservation Industries, Inc., Pittsburgh, Pennsylvania

APPENDIX

Some Landfill Facts:

1. A true sanitary landfill is not an open dump. (1)

2. Rats are persistent. Their complete elimination will be very difficult, but authorities state that a properly operated sanitary landfill will not support rats. (2)(3)

3. No fires are allowed. (1)

4. Wastes are covered completely at the close of each day. (1)

5. Daily cover is compacted to a depth of at least six inches. (2)

6. Final cover depth is two to three feet of compacted soil. (1)

7. Operating costs are low. In this area, $1.00 per ton may be typical (at 1600 tons per day). (1)

8. Decomposition is slow. Although the peak activity is reached at about two years, some decomposed material will remain after fifteen years. (4)

9. A potential water pollution hazard is present. Competent geological surveys usually minimize the problem. (5) The New York State Department of Health states "refuse placed no deeper than three to five feet above the ground water table or bedrock will not present any serious hazard. (2)

10. The most frequently reported operating difficulty has been blowing paper. (1)(5)

11. Diligent maintenance is required. The fill must be leveled for drainage. Settling cracks must be filled. (2)

12. Methane production may be a serious problem. (6)

13. Sites do not settle uniformly; regrading before use is a necessity. (5)