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SOLID WASTE AND THE COAST

A Staff Working Paper

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Note: This staff working paper is one of a series of Issue and Policy Alternative Papers presenting facts, analyses, and conceptual policy alternatives on coastal resources and coastal land and water uses. The purpose of this draft document is to stimulate discussion and comments that will assist preparation of the management program for the New Jersey coastal zone.

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Comments, criticism, additions, and suggestions are welcome and should be addressed to the New Jersey Office of Coastal Zone Management.

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INTRODUCTION

New Jersey's dense development and growing population generates a considerable quantity of solid waste. The coastal area currently provides sites for the disposal of both coastal and non-coastal generated wastes. The amount of land suitable for waste disposal, however, is diminishing, necessitating the consideration of new approaches. An additional problem is the extensive damage to groundwater supplies caused by the dumping of soluble chemical wastes into on-site disposal facilities.

This paper is intended to further debate on important solid waste disposal issues. The first two sections briefly define these issues in the coastal area and then present alternative policies which could be part of the coastal zone management program in New Jersey.

Section III describes current waste disposal practices and problems in New Jersey's coastal area.

Section IV analyzes the issues mentioned in Section I in the light of existing and potential disposal methods.

Five appendices conclude the paper. First, the six coastal zone regions are examined individually and problems specific to the region are highlighted. The second appendix briefly discusses possible management tools which could be used to implement waste disposal policies.

Appendix C contains ten tables which provide supporting data on solid and liquid waste disposal, differentiated between the coastal plain counties and the northeast counties. Appendix D defines the various solid waste types discussed in the text and in the tables. The final appendix provides the sources used to support the text.

I. ISSUE

Solid waste disposal raises two basic issues. First, the number of landfill sites capable of handling the increasing volume of solid waste is declining. Second, the disposal of chemical wastes in landfills is damaging groundwater supplies, particularly in the coastal plain. Both of these issues suggest that new solid waste disposal methods and attitudes may become necessary in future years.

Though the problem associated with the lack of suitable landfill sites is most critical in the northeastern counties, it is becoming increasingly pressing in the coastal zone and the rest of the state as well. Although ample open land is still available in coastal counties, only a limited portion of this land is actually suitable for solid waste disposal. This is due to a variety of factors, including incompatibility with the physical environment, incompatibility with existing land uses, and the failure of landfilling practices to achieve environmental and health acceptability.

The shortage of suitable landfill sites can lead to other problems which need analysis: the encroachment of waste disposal sites into unsuitable areas or increased costs resulting from the hauling of wastes to appropriate disposal sites.

Obviously, all wastes must be disposed of somewhere. Economic factors could cause continuation of current methods resulting in continued landfilling of unsuitable areas. Such action, which would create environmental and health hazards, could be a necessary alternative, unless general changes in the methods of disposal become accepted.

The other problem related to lack of suitable land for landfilling relates to cost. Since the cost of hauling wastes from the collection point to the disposal site is high, landfill sites relatively close to population centers may be economically desirable from a municipal point of view. The lack of suitable land is greatest near these population centers, however, so landfills will be pushed increasingly further away into more rural areas. It is likely that the urbanized areas of Camden and Trenton and the rapidly developing eastern New Jersey shoreline will soon experience this problem.

The second major solid waste issue is the spilling and disposal of liquid chemical wastes in the coastal zone. Such wastes, which may be inadequately treated or have a tendency to leak or spill onto the ground, are particularly damaging to groundwater supplies because they are often soluble in water and thus are leached downward through the soil to the groundwater table. Chemical waste generation and disposal is particularly high in Camden and Gloucester Counties where the majority of the chemical manufacturing plants in the coastal zone are located. Middlesex, Atlantic, and Salem Counties also receive large amounts of chemical wastes from other coastal counties and areas outside the coastal zone.

II. POLICY ALTERNATIVES

1. Sanitary landfill sites could be limited to those areas which are environmentally and socially suitable. Criteria would be developed in order to identify suitable areas. Such criteria would include soil suitability, groundwater level, topography, proximity to surface waters, proximity to major transportation routes, proximity to population centers, and compatibility with adjacent land uses. This designation of criteria would be done separately for each category of solid waste.

2. The amount and type of solid waste which would be accepted for landfill disposal in coastal counties each year could be limited. The ceiling level placed on disposal in each county would be based on the amount of land identified as being suitable for landfilling. This policy would tend to reduce the amount of solid waste which would be accepted from outside the coastal region as well.

3. A more regionalized approach could be adopted for combatting solid waste problems. Though it is largely the local governments which will be experiencing the problem of lack of suitable land for landfilling, the generation and flow of wastes is a regional phenomenon. Thus, a regional solid waste management system would be better able to coordinate all collection, transfer and disposal activities.

4. A coordinated system of transferring the wastes from points of collection to disposal sites could be instituted. Such a system would tend to reduce municipal costs of disposal but may require some sort of state financial assistance. This procedure would be of particular benefit to those municipalities required to dispose their wastes in other counties having greater landfill capacities.

5. The increased use of shredding, baling, and other methods of greater volume reduction of wastes could be encouraged. Maintenance of such methods would be the responsibility of each of the municipalities using the facility, with possibly, some sort of state financial assistance. The large number of municipalities using each facility would minimize individual costs.

6. Industries in the coastal zone could be encouraged to treat, process and reuse as much of their wastes as is economically feasible. Guidelines would be issued by the Department of Environmental Protection in order to provide industries with technological and economic developments relating to resource recovery and recycling.

7. Citizens in the coastal zone could be encouraged to separate and sort their wastes in the home. This front-end separation would tend to reduce costs involved in recycling materials, resulting in the increased feasibility of this form of waste reduction. Information

on recycling and existing solid waste problems would be issued by the Department of Environmental Protection in order to educate the general public.

8. Methods of preventing severe environmental degradation by landfilling could be adopted and enforced. In order to eliminate environmental and health hazards associated with landfills, existing regulations would require broadened inspection and enforcement procedures of landfill sites.

9. No special consideration could be given to the determination of suitable landfilling sites and methods of waste disposal. Such issues have traditionally been the responsibilities of the individual municipalities, although recent legislation has established county solid waste management districts. There is a substantial amount of legislation which already exists in order to regulate municipal and private waste disposal practices. This policy assumes that alleviation of the solid waste problem can be adequately achieved at a lower government level (i.e. municipal and/or county). These practices often stress economics above other considerations.

III. WASTE DISPOSAL CHARACTERISTICS

The amount of solid waste generated is highly dependent on population, commercial, industrial, agricultural activity, and other factors. In New Jersey, these factors combine to produce a significant amount of solid waste.

Most per capita estimates for domestic waste production for New Jersey fall between 3.5 and 4.5 pounds per day. The domestic wastes are largely composed of paper products, plastics, glass, lawn substances, metals and food wastes. Though the more-densely populated northeastern counties comprised more than half of the state's domestic solid waste generation in 1968, the rapidly-growing southern coastal counties are increasing their proportions of the state total.

Commercial activity has been steadily increasing over the years in New Jersey, as a whole, and in each of the coastal counties, leading to significant accumulations of commercial wastes. Wastes produced from commercial activity are basically the same as domestic wastes. An added component is provided by health-related institutions which generate pathological wastes.

Less than 35 percent of the state's industrial activity occurs in the eleven coastal counties. Much of the industrial wastes which are disposed in these counties, however, are

transported from Northern New Jersey, Pennsylvania, New York, Delaware and other areas. In contrast, few wastes are transported out of the coastal area.

Major state industries include chemical manufacturing, plastics, apparel, food products and textiles. The wastes produced by industrial activity vary depending on the type of industry.

Agricultural wastes have not yet proven to be a major solid waste problem in New Jersey due to the frequency of on-site disposal. However, the problem is likely to grow as expansion of residential development onto agricultural lands precludes continuation of these disposal techniques which can be unsanitary and odor-producing. In addition, new technological developments may tend to produce more concentrated crops and animal-grazing, thereby concentrating the resultant wastes as well. The principal wastes in the state attributed to agriculture are animal manure, orchard prunings, crop residues, animal carcasses, and greenhouse wastes.

Other miscellaneous wastes include street litter, discarded auto bodies, sewage sludge, oils, tires, hazardous wastes, and construction-demolition materials. This latter type of waste produced from construction activities has often been illegally used as a filling material in wetlands areas, though the amount of land reclaimed each year is minimal.

Most of this disposal in the wetlands has been eliminated as a result of the Wetlands Act of 1970, but small, isolated instances do still exist.

The major method of solid waste disposal used in New Jersey is the sanitary landfill. These landfills vary throughout the state in size and types of waste accepted. Generally, the landfills are located in undeveloped land areas outside of the higher density urban and suburban areas which they service. Since the transport of solid wastes is one of the most costly aspects of solid waste systems, landfills are usually located within easy access to the population centers.

Landfills in New Jersey can be either privately or publicly owned. Most are used to dispose of wastes generated elsewhere though some collect on-site generated wastes. Landfills which accept refuse for a fee from municipalities are registered with the Public Utilities Commission for the purpose of fee regulation. All known landfills are environmentally regulated by the Department of Environmental Protection.

The process of sanitary landfilling theoretically consists of compacting the wastes, placing in layers, and covering with soil material. Such landfilling may occur either in trenches or on top of the earth's surface. This process, as opposed to open dumping, is intended to reduce the problems associated with rodent and insect infestation, gas emissions, fires, and the carrying of litter by the wind. Also, any facility receiving pesticides, chemical wastes, hazardous

wastes, and other liquids must have a system installed for the interception, collection and treatment of all leachates generated. Unfortunately, violations are often reported and reduction of these hazards is not always achieved.

Other methods of solid waste disposal also exist in New Jersey to a limited extent. These methods are presently used mainly in the Northeast Region where the lack of landfill sites is the most severe. The southern coastal counties have made very little use of alternate methods since the need is not yet as critical as in the Northeast.

The reason that alternatives to landfill disposal have not yet gained widespread acceptance is one of economics. For instance, incinerators were once fairly common but the additional cost burden required for compliance with recently enacted air pollution regulations has greatly contributed to their disappearance throughout the state. In addition, a very limited number of composting, resource recovery, and recycling facilities exist. Composting and resource recovery are not widely practiced in the coastal zone because only a limited market exists for the finished products. Furthermore, recycling may be uneconomical if waste separation and sorting is not done before the wastes enter the facility.

Many of these problems arise because recycling, resource recovery and other new technological advances challenge traditional modes of operation. Efforts to increase their acceptability and availability may, however, be necessitated by the decreasing availability of landfill sites.

IV. ANALYSIS

Total solid wastes disposed in coastal counties in 1974 measured approximately 9.75 million tons. In addition, liquid wastes deposited in these counties measured 166 million gallons. Of these totals, 30 percent of solid wastes and 36 percent of liquid wastes were generated outside of the coastal planning area.* The landfills in the coastal counties therefore, play an important role in solid waste disposal for many areas. This is primarily due to the even lower landfill capacities available in these other areas.

It is anticipated that the need for disposal of non-coastal generated wastes in the coastal area may increase in the near future due to recent developments in the Hackensack Meadowlands. These marshlands of northeastern New Jersey have long been used as a cheap disposal site for wastes generated in 118 New Jersey communities and a number of communities in New York State, including New York City. In 1973, the region was accepting a total of 50,000 tons of wastes each week. That year however, the Hackensack Meadowlands Development Commission prohibited all out-of-state dumping in the Meadowlands in order to prolong the life of existing landfills for use by the New Jersey communities. Even so, five of the six remaining landfills are expected to be phased out by 1977 and the last by

*The coastal planning area, for the purposes of this report, is defined as all of Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Middlesex, Monmouth, Ocean and Salem Counties. A separate analysis for Bergen, Essex, Hudson, Passaic and Union Counties is given in the Northeast regional report.

1979. Many of the communities served by the Meadowlands will seek other areas for disposal and the coastal area is a likely location.

The amount of land area required each year for disposal of wastes depends not only on the amount of wastes generated, but also, on the amount of volume compaction which is achieved before depositing in the landfill. In addition, the ideal sanitary landfill situation would add one unit of cover soil to every four units of solid waste in order to reduce rodent, insect, fire, gas, and odor problems. Such a situation would tend to use up a considerable amount of land in solid waste disposal, thereby presenting the need to continually seek out new landfill sites. An example of acreage requirements for a population of 1,000 persons assuming a solid waste generation rate of 4.5 pounds per capita per day is given below:

	Compaction Density in pounds per cubic yard		
	700	1000	1200
cubic yards per year	2933	2053	1711
acre-feet per year	3.00	2.12	1.75

source: Greenberg, Report on Intuitive-Interactive Model, 1976.

At present, bulldozer compaction is the primary method in use. This type of compaction yields an average density of 700 pounds per cubic yard, resulting in the most extensive land requirement. Greater compaction could be achieved through shredding or baling. As existing disposal sites approach capacity, new sites become necessary. These new sites will be increasingly difficult to find due to the shortage of compatible open spaces.

One reason for the lack of suitable landfill sites is environmental factors. The coastal plain, which essentially covers all eleven coastal counties in southern New Jersey, is characterized by minimum slopes, sandy soils, good percolation, and a high water table. The potential for leaching of soluble wastes into the ground of the coastal zone then, is quite high. This creates a possible danger to the people in the coastal zone and elsewhere in the state dependent on the groundwater supply. Surface water quality is also an important factor to consider. In order to prevent environmental and health hazards to as great an extent as possible, landfills must be located only in areas in which damage can be minimized.

The expanding urban, suburban, and seasonally-populated areas within the coastal zone also reduces the amount of land available for landfilling. Not only does such development physically reduce the open space which could be used, but the land uses adjacent to open space makes waste disposal

an incompatible use as well. Because of the various environmental and health hazards, odors, and ugly appearance associated with landfills, property values and quality of life of the adjacent areas could be affected.

Also, because of the rapid residential development in recent years, citizens often oppose the loss of additional open lands. Landfilling is certainly not one of the most appealling uses to take the place of open spaces, even though proper landfilling may be reclaimed for recreational and open space purposes at completion of the process. Many people would prefer to have the open spaces for immediate use or preserved in a natural condition, rather than waiting for the sites to be reclaimed at some future date.

The existence of such factors and characteristics presents three alternatives for solid waste disposal: disregard environmental factors and locate landfills anywhere vacant land exists, relocate landfills in suitable areas even though such areas may be located at a distance from population centers, or adopt new methods of solid waste disposal

The first of these alternatives, that of locating landfills anywhere regardless of impacts, is unlikely since state regulations preventing environmental degradation have already been adopted.

The second alternative, which requires a relocation of landfills to more rural areas while complying with environmental considerations, would increase public costs of hauling solid wastes from the population centers to the disposal sites. Since the hauling of wastes from the collection point to the disposal site is among the highest cost categories in the total solid waste system, each additional mile could contribute significantly to costs.

The third alternative is the adoption of costly new solid waste disposal and volume reduction methods, including incineration, composting, recycling, and various types of resource recovery. Such practices would greatly reduce odors, disposal hazards and nuisances, and the volume of wastes requiring final disposal. In addition, these methods have the advantage of producing marketable resources which can be reused in the system rather than requiring land disposal with no economic value. For instance, pyrolysis yields a low BTU value oil and/or gas from the solid waste, as well as a conglomerate of burnt char which may be used as a road-grading material. A dry fuel process also yields a low BTU value fuel and water-wall incineration produces steam for fuel. Composting creates a fertilization material for soils. Recycling allows for the reuse of glass, paper, metals and other original waste products. At present, however, there is a lack of experimentation, confidence, and economic commitment to such

waste-reducing techniques. Because of the high cost of these processes, they may be introduced in urbanized areas rather than the less densely developed areas of the coastal zone. Their use anywhere in the state, however, could lessen the waste disposal load falling on the coast.

The second issue related to solid waste in the coastal zone is the generally uncontrolled dumping and spilling of liquid chemical wastes which occurs at existing chemical disposal sites. Though state legislation requires the installation of a system for the interception, collection, and treatment of all leachates generated before a facility may be approved for accepting chemical wastes, violations and accidental spillings do exist. Thus, this potential pollution problem occurs at many on-site chemical processing and treatment facilities. Unlike many of the waste types deposited in the coastal area which have only minimal effects on the environment, chemical wastes create a significant problem. This is due to the permeable nature of the coastal soils and the soluble character of many of the chemical wastes. Once the chemicals are mixed with rain water, leaching from the landfill occurs. The chemicals easily pass through the soils until they reach the generally high groundwater level. In contrast, liquid sewage sludge and septic tank clean-out wastes are often filtered out before they reach the groundwater.

Because of the heavy use of groundwater wells in the coastal zone, chemical pollution to the groundwater may have severe consequences. In fact, where chemical generation and disposal rates are among the highest in the coastal area, the groundwater characteristics are probably the most incompatible for receiving these wastes. This occurs along the Delaware River area where the outcrop for the widely-utilized Raritan-Magothy aquifer formation exists.

APPENDIX A

REGIONAL REPORTS

1. The Northeast (Bergen, Passaic, Hudson, Essex, and Union Counties)

The problem of solid waste disposal in the Northeast region is by far the most severe of all the regions in the state. For this reason, the region has been treated as a separate entity and was not included in the analysis of the main report. Virtually no vacant open space suitable for future landfilling exists in the Northeast. As a result, alternate solid waste disposal facilities have become increasingly popular.

General Characteristics

The population of the five-county region comprises about 50 percent of the state's total population. This figure represents an average population density of 4,895 persons/sq. mi. in comparison to the overall state density of 957 persons/sq. mi. Obviously, the domestic wastes generated in this region would also exceed those of any other region in the state.

Industrial and commercial waste generation is also very high due to the heavy activity of both sectors. Agricultural wastes on the other hand, are slight as very few farms are interspersed with the urban and suburban development.

Only a small fraction of total solid wastes disposed in the region is generated outside the region although more than half of the liquid wastes fall into this category. The major

solid waste types are municipal wastes, industrial non-chemical wastes, construction-demolition wastes, bulky wastes, and junked autos.* The major liquid wastes are septic tank clean-out wastes, chemical wastes, liquid sewage sludge, and bulk and semi-liquids.

Unlike the other regions, alternative methods of waste disposal and/or volume reduction to landfilling are being used to a larger degree, although landfills are still extensively used. Compost facilities are already fairly numerous. Several resource recovery facilities also now exist. Of the 42 landfills situated in the five counties, many have already been closed and most of the others are expected to close before 1980.

Analysis

Although waste disposal by landfilling in the Northeast region is very high, continuation of this practice will be impossible in the future. Due to the heavy development which has occurred in the past, there is literally no more land available for meeting the high acreage requirements of sanitary landfills. Environmental regulations prevent future haphazard use of the Hackensack Meadowlands which is the only open section of the region. With five of the six heavily used landfills which are now used in the Meadowlands scheduled to close in 1977 and the last in 1979, the need for additional methods of waste reduction and disposal is immediate.

*The definitions of these and other waste types as defined by the Bureau of Solid Waste Management are provided in Appendix D.

Fortunately, the solid economic base, the large amount of waste generation, and the availability of a market for recovered resources make alternate methods appear more feasible here than in any of the other regions. In fact, plans have been made for the use of a large resource recovery facility and baling facility in the Meadowlands, and construction is awaiting funding. The widespread use of alternate disposal methods in the Northeast region could also help to alleviate the problem of disposal in some of the other regions since fewer wastes would have to be exported.

2. North Shore (Middlesex and Monmouth Counties)

The North Shore region is a major disposal area for a large number of waste-generating areas. If present practices continue, however, the existing landfill sites in this region will be almost exhausted within 25 years.

General Characteristics

The geographical location of the North Shore region, particularly Middlesex County, has made it an attractive area for solid waste disposal by New York and some of the counties of northern New Jersey. The origins of liquid wastes disposed in Middlesex County are even more widespread than those of solid wastes, coming from New York, Delaware, Pennsylvania, and all but four New Jersey counties. Approximately 44 percent of all solid wastes and 82 percent of all liquid wastes deposited in the county come from outside the North Shore region.

The total amount of wastes deposited in the two-county region comprises 43 percent of all solid wastes and 29 percent of all liquid wastes disposed in the eleven-county coastal planning area. The major solid waste types disposed in the region are municipal wastes, industrial non-chemical wastes, institutional wastes, construction-demolition wastes, and bulky wastes. The major liquid wastes are sewage sludge, chemical wastes, and septic tank clean-out wastes.

The primary method of disposal is the sanitary landfill with a total of 50 in the two counties. In contrast, only 8 composting facilities and 3 chemical processing and treatment facilities exist. A 1973 study indicates that only 8 of the 38 landfills reporting have estimated remaining lives in excess of 25 years. Another 15 landfills have 10 or less years remaining.

Analysis

Many of the existing landfills are subject to flooding and several are located on wetlands and aquifer recharge areas. These landfills were so located due to the cheap land available and the lack of environmental restrictions on solid waste disposal. Some of these landfills have closed while others have remained open due to convenience, haul distance, availability of cheap land, and local dependence. Environmental and health violations abound, even in areas used for liquid chemical wastes. Kin-Buc Landfill in Edison, for instance, has been a center of controversy for several years.

Future landfills would be prohibited from being located in many environmentally-sensitive areas as in the past due to legislation preventing contact of disposal sites with water sources. Such a restriction would greatly reduce the amount of land capable of accepting solid wastes. In addition, the large, year-round populations of both counties, in comparison to the other coastal counties, has caused heavy suburbanization and development of land to occur, reducing the number of suitable landfill sites even further.

Because of the amount of industry which exists in the region, primarily in Middlesex County, and the close proximity to the urbanized north, this region probably holds a good potential for resource recovery and other waste-volume reducing methods. The large amount of wastes which come into the region and the presence of a potential market for recovered materials makes consideration of these other alternatives a practicality.

3. Central Shore (Ocean County)

The rapid increase in seasonal and nonseasonal development in Ocean County has created a rise in waste generation while existing landfill sites approach capacity. Prospects for acquiring new landfill sites locally appear to be poor.

General Characteristics

Ocean County has experienced more residential development in recent years than any other county in New Jersey. In fact, more than 17 percent of all housing units constructed in the state between 1971 and 1972 were located in Ocean. Most of these have been year-round homes rather than summer homes. The county population has increased by more than 20 percent between 1970 and 1974. Obviously, the rapid increase in population has been accompanied by a rapid increase in domestic waste generation as well. These internally-generated solid wastes comprise the major portion of total solid wastes disposed in the county, although liquid wastes originate from a wider area.

The five major solid waste types disposed in the county, in decreasing order of tonnage are: construction-demolition wastes, municipal wastes, tree stumps, bulky wastes, and vegetative and tree wastes. The largest liquid wastes in gallons are: septic tank clean-out wastes and liquid sewage sludge.

There are presently 20 sanitary landfills for disposal in the county. Of the 14 landfills reported in 1973 (this figure may not be complete because of the number of facility owners who did not report), five were listed as having five or less years of remaining life and another one having less than ten. Seven were reported to have more than 25 years of remaining life.

Analysis

Ocean County soils are not particularly conducive to sanitary landfilling of wastes. The soils are generally sandy, thus providing excellent subsurface drainage and rapid recharge of the aquifers underlying the county. The 36 percent of the county which lacks rapid drainage is considered to be wetlands, characterized by shallow ponds and standing water bodies. The presence of such geological conditions indicates that locating landfills without degrading water supplies could be a difficult task.

Solid waste disposal costs have already escalated for some communities as the hauling distance to the landfills has increased. This is particularly true of several of the barrier beach island communities which must transport their wastes over a limited number of bridges to the mainland. The problem is augmented by the fact that there are virtually no prospects for future landfills in the heavily populated mainland municipalities of Dover and Brick.

4. South Shore (Burlington, Atlantic and Cape May Counties)

The quantity of solid waste generated in the South Shore region is largely attributable to the seasonal influx of population which occurs in resort communities each year. The wastes produced during this period are sufficient to create disposal problems within the region.

General Characteristics

The South Shore region is highly dependent on its attraction as a summer resort area for its economic base. Because of this dependency, seasonal migrations into the region are actually encouraged. As a result, the volume of waste produced in the region during the summer is roughly equivalent to the wastes generated during the remainder of the year.

In comparison to most of the other planning regions, the quantity of solid waste disposed in the region is small. The quantity of liquid wastes, however, is fairly high. Almost all of these wastes are generated within the region. The major solid waste types being disposed are municipal wastes, bulky wastes, construction-demolition wastes, vegetative and tree wastes, and tree stumps. The major liquid waste type is septic tank clean-out wastes, although Cape May County also receives liquid sewage sludge and chemical wastes.

There are a total of 41 landfills in the region (excluding those located in the Burlington County portion) in addition to several composting facilities. Of the 30 landfills identified in 1973 (this figure only reflects those facilities reported by the owners) only 7 were estimated to have more than 25 years of remaining life. On the other hand, 12 had life expectancies of only 10 years or less.

Analysis

The problems which plague the other coastal regions exist in the South Shore region. The lack of available land for landfilling is particularly evident in the barrier island resort cities, although many of the inland townships are also becoming quite developed. Farther inland, the region is characterized by a more rural setting. However, caution must be stressed when searching for adequate landfill sites since wetlands and other environmentally-sensitive lands abound.

Due to the inconsistent waste flows, the lack of industry and year-round population, and the tourism-oriented economic base, methods of disposal other than landfilling seem economically impractical in most of this region. The same is true of expensive and insufficiently-tested volume reduction techniques such as resource recovery. The options for this region are quite limited so it appears necessary that potential landfill sites be acquired before additional development can occur.

5. Delaware Bay (Cumberland and Salem Counties)

The Delaware Bay region receives only a small portion of the total quantity of waste disposed in the coastal planning area. At the present time, it appears that this region has the least demand for additional, large-acreage landfill sites.

General Characteristics

Solid waste disposal in the Delaware Bay region comprises a mere three percent of the total quantity of solid wastes disposed in the eleven-county planning area. Liquid wastes in the region, however, account for almost twenty percent of total liquid wastes disposed in the planning area. The high percentage of liquid wastes in the region is largely attributed to the heavy reliance on septic tanks.

The small quantity of wastes disposed in the two counties is primarily due to the area's low population level. The Delaware Bay region is neither a popular seasonal attraction nor a popular year-round living area. As a result, the population of the region is only six percent of the total population in the planning area.

An additional reason for the small amount of disposal activity is the lack of easy access into the region from other areas. Though some wastes are transported into the region from nearby areas, inter-regional disposal is quite limited.

The principle solid waste types disposed in the region are municipal wastes, industrial non-chemical wastes, construction-demolition wastes, and tree stumps whereas the major liquid wastes are septic-tank clean-out wastes and liquid sewage sludge. These wastes are mainly disposed in any of the 39 landfills which exist, although some composting facilities are also available. Of the 31 landfills reported in 1973, only three are shown to have more than 25 years of remaining life while 17 have 10 or less years.

Analysis

Though the Delaware Bay region is primarily rural, a significant portion of the land area consists of wetlands and environmentally-sensitive areas. Locating future landfills, therefore, should be done with caution. Fortunately, the small volume of waste received for disposal in the county minimizes the future land area that will be needed in order to handle the wastes after existing landfills have closed. Future growth in this region is anticipated to be rather limited so this trend of a light volume of waste disposal should remain constant.

This region, probably more than any other region in the coastal zone, is limited to the use of landfills rather than other techniques for the disposal of future wastes. The small population and lack of a solid economic base makes widespread use of alternate techniques economically infeasible.

6. Delaware River Water Front (Gloucester, Camden, Burlington, and Mercer Counties)

The Delaware River Water Front region presently serves as an important disposal site for wastes generated in the Philadelphia area in addition to its own internally-generated wastes. Many of the wastes which are deposited on the land are dangerous chemical wastes. Though much undeveloped land still exists in the region, suburbanization is rapidly eliminating potential landfill sites.

General Characteristics

Due to the region's close proximity and easy access to the Philadelphia area, a large portion of the total quantity of wastes which are landfilled in the region originate across the river. In fact, 39 percent of the solid wastes and 27 percent of the liquid wastes deposited in the region are from Philadelphia and its suburbs. Overall, the disposed solid wastes from all sources in the four counties comprise 44 percent of the total tonnage received in the coastal planning area. Liquid wastes in the region represent about 23 percent of the total volume in the planning area.

The principle solid wastes being disposed include municipal wastes, construction-demolition wastes, industrial non-chemical wastes, dry sewage sludge, and bulky wastes, in decreasing order of tonnage. The major liquid wastes in decreasing number of gallons are bulk and semi-liquids, septic tank clean-out wastes, and liquid sewage sludge. Unlike many of the other regions,

chemical wastes and waste oils are also disposed in large quantities in the region due to the chemical plants and oil refineries located on the river.

There are presently 71 landfills in the four-county region (the actual number is slightly lower due to part of Burlington County's inclusion in the South Shore region). A total of nine composting facilities also exist. In 1973, only three of the 47 landfills reported were estimated to have more than 25 years of remaining life while 27 have less than 10 years.

Analysis

Heavy manufacturing, including manufacturing of chemicals, is located primarily along the Delaware River. The important Raritan and Magothy aquifer formation also outcrops along the river. On-site chemical disposal at some of the industrial sites has serious implications for the widely-used groundwater from this aquifer. Though treatment of the wastes is generally enforced, violations and spills are believed to be frequent.

Urban development has also occurred mainly along the river where cities such as Camden and Trenton and their suburbs have been built. More recently however, development has been expanding into the more rural central and eastern portions of the region. Although adequate open space still exists in these areas, development is rapidly reducing lands available for landfilling. This is particularly true of the central portion which has become part of Philadelphia's suburban ring.

The regulation of solid waste collection, disposal and management is an indirect control on both local and regional growth. Sanitary landfill sites are now regulated or are capable of being regulated by numerous laws. Groundwater quality is a primary consideration in state approval for new sites or maintenance of operations on existing sites.

Within the coastal area, the CAFRA statute requires a permit for a sanitary landfill pursuant to N.J.S.A. 13:9-5. Sanitary landfills outside the coastal area but within the coastal zone will in many cases require a Stream Encroachment Permit pursuant to N.J.S.A. 58:1-26 et seq. or if the site is on a navigable waterway a permit must be obtained from the Division of Marine Services pursuant to N.J.S.A. 12:5-3. The Division has broad discretion to protect the public health, safety, and welfare in making the initial determination of waterfront development applications.

These statutes can use a wide range of environmental criteria both site specific and regional in evaluating applications for sanitary landfills.

The type and amount of solid waste is regulated pursuant to the Solid Waste Management Act of 1970, N.J.S.A. 13:1E-1 et seq. and N.J.A.C. 7:26-1 et seq. No new solid waste facility can operate without first installing a groundwater monitoring system. No sewage sludge or other fecal material may be lagooned under the

solid waste regulations. These regulations further provide that any solid waste facility accepting pesticides, chemical, bulk liquids, semi-liquids or hazardous wastes on or in the ground must install monitoring wells approved by DEP.

A coordinated system of transferring waste from points of collection to disposal may be desirable. Municipalities are authorized to create joint facilities for the disposal of garbage and other refuse pursuant to N.J.S.A. 40:66A-1 et seq. Revenue bonds may be issued by such authority. Financial assistance by the state to such intra-municipal authority could be authorized pursuant to N.J.S.A. 40:66A-1 31.11 et seq. which allows the State to purchase such bonds.

Industries within the coastal area could be required as part of the utilities plan of the proposed CAFRA Rules and Regulations, 8 NJR 176(a) section 12-4(g) to identify, locate and describe the proposed type and capacity of solid waste and garbage collection and disposal. These regulations if adopted could serve as an informational basis for developing solid waste guidelines outside the coastal area for the remainder of the coastal zone. These regulations can encourage or require recycling of wastes in larger industrial project applications, subject of course, to reasonable economic limitations.

Prevention of severe environmental degradation by irresponsibly operated landfills is an ongoing process within DEP. By Departmental Order, dated July 1976, and for violations of NJAC 7:26-1 et

seq. the Kin-BUC Solid Waste Disposal Facility landfill in Middlesex County was ordered closed. The landfill occupies 40 acres and fronts on the Raritan River. Under the closure order, Kin-BUC is required to submit a detailed plan for closure including the building of a dike for containing leachate and preventing surface water from entering the site, as well as a plan for treating the leachate to protect the groundwater. The closure order resulted in Kin-BUC refusing to accept wastes tainted with hazardous chemicals. The goal of complete closure of the facility is the subject of a joint hearing to be held by the Public Utility Commission and DEP.

New Jersey has addressed the problem of receiving wastes from other states by enacting the Waste Control Act of 1973, N.J.S.A. 13:11-1 et seq. The Commissioner of DEP has the authority to prohibit control and condition the disposal of solid wastes within the state which originated or were collected outside the territorial limits of the state. This statute and appurtenant regulations were upheld by the State Supreme Court in the case of Hackensack Meadowlands Development Commission v. Municipal Sanitary Landfill Authority 68 N.J. 451, 348 and 505 (1975).

This case has been consolidated with the City of Philadelphia v. State of New Jersey case and is now awaiting argument before the U. S. Supreme Court.

In summary, the state has comprehensive controls to regulate construction and operation of all solid waste facilities throughout the coastal planning area. The state has authority to require the existence of adequate sanitary waste disposal facilities, however, only in the CAFRA area. Other types of landfills are not regulated by the CAFRA statute. In addition, the state lacks the authority to the use of alternative treatment methods such as recycling. However, through the application of existing controls, the state may be able to markedly increase the economic feasibility and attractiveness of the alternative methods.

APPENDIX C

TABLES

TABLE 1

TYPES OF WASTES DISPOSED IN COASTAL ZONE COUNTIES IN 1974

(First 17 waste type categories are given in tons; second 6 waste type categories are given in gallons)

Waste Type	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	TOTAL
Solid Waste *												
Municipal	157,975	750,421	525,567	32,331	176,789	602,737	522,922	1,470,631	276,941	173,997	10,500	4,700,860
Institutional	6,192	30,632	5,686	0	2,481	38,707	3,512	57,519	508,437	3,250	0	656,416
Dry Sewage Sludge	224	134,379	172,186	542	1	0	0	1,772	156	2,210	0	311,470
Bulky Waste	18,329	42,895	129,299	100,476	936	13,380	8,321	245.232	27,605	72,395	28	658,896
Construction Demolition	42,859	26,047	344,508	2,666	19,681	177,129	40,408	361,202	174,549	218,720	1,155	1,408,924
Dry Pesticides	0	0	0	0	0	40	0	2	0	0	0	42
Hazardous Waste Containers	0	1	0	0	0	3	1	107	0	0	0	112
Dry Hazardous Wastes	150	0	7	0	0	1,780	0	1,170	0	0	0	3,107
Dry Chemical Wastes	145	5,100	2,438	0	562	2,282	0	7,822	0	0	0	18,349
Junked Autos	10	0	2	10	0	448	0	0	1	60	0	530
Tires	62	383	5,273	130	1,009	4,170	71,765	23,522	200	234	0	106,748
Vegetative & Tree Wastes	7,567	3,794	12,227	10,779	3,005	2,884	145,562	115,045	9,879	21,850	35	332,627
Tree Stumps	16,345	13,975	734	684	20,632	1,356	2,160	81,690	2,282	72,680	25	212,563
Dead Animals	1	0	0	0	0	0	0	6	7	0	0	14
Food Processing Wastes	347	5	18,242	0	700	0	0	7,413	750	221	0	27,678

(continued)

	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	TOTAL
Oil Spill Cleanup Wastes	1	0	2	0	20	780	0	37,757	0	92	0	38,652
Industrial Non-Chemical	6,393	75,705	232,557	1,050	28,226	79,858	79,729	695,226	45,218	1,509	26,983	1,272,454
TOTAL TONS	256,600	1,083,337	1,448,728	148,668	254,042	925,554	874,380	3,106,116	1,046,025	567,218	38,776	9,749,444
Liquid Wastes												
Waste Oil	0	0	1,755,057	0	2,000	306,500	252,500	2,071,161	0	150	0	4,387,368
Semi-Solid Waste Oil & Sludges	0	0	786,552	0	50	435,500	148,125	5,489,590	0	225,017	0	7,084,834
Bulk Liquid Semi-Liquids	0	18,000	3,784,224	0	10	16,025,750	302,000	2,430,850	0	95,000	0	22,655,834
Septic-Tank Clean-Out Wastes	26,207,300	4,403,100	116,750	2,999,400	24,435,100	2,837,386	678,550	4,980,100	743,700	12,353,900	5,046,500	84,801,786
Liquid Sewage Sludge	549,800	303,000	2,145,000	0	2,074,000	1,369,345	0	17,510,000	0	4,414,775	4,000	28,369,920
Pesticide, Chemical & Hazardous Waste Liquids	410,000	0	456,286	0	0	2,773,359	63,333	15,131,919	192	0	232,000	19,067,089
TOTAL GALLONS	27,167,100	4,724,100	9,043,869	2,999,400	26,511,160	23,747,840	1,444,508	47,613,620	743,892	17,088,842	5,282,500	166,366,831

*Definitions of waste types as defined by Bureau of Solid Waste Management are provided in Appendix D.

SOURCE: Bureau of Solid Waste Management, Department of Environmental Protection, County Disposal Data, 1974

TABLE 2

SOLID WASTE FLOWS (TONS) IN COASTAL ZONE COUNTIES

Origin County \ Disposal County	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	Total
Atlantic	248,334	0	495	0	0	0	0	0	0	0	0	248,329
Bergen	0	0	0	0	0	0	0	3,788	0	0	0	3,788
Burlington	2,600	547,030	40,064	0	0	39,800	0	0	0	15,000	0	644,494
Camden	24	14,153	643,146	0	1,000	89,045	0	0	0	0	0	744,368
Cape May	5,601	0	0	148,668	0	0	0	0	0	0	0	154,269
Cumberland	0	0	0	0	253,042	5,050	0	0	0	0	0	258,092
Essex	0	0	0	0	0	0	0	38,069	0	0	0	38,069
Gloucester	24	755	51,740	0	0	239,026	0	22	0	0	1,300	292,867
Hudson	0	0	0	0	0	0	0	3,388	0	2	0	3,390
Hunterdon	0	0	0	0	0	0	35,639	9,134	0	0	0	44,773
Mercer	0	84,548	102	0	0	100	838,158	166,028	1,841	2,160	0	1,092,937
Middlesex	0	0	1,300	0	0	1,190	579	1,692,486	2,866	360	0	1,698,781
Monmouth	0	0	0	0	0	0	0	46,071	1,023,209	16,678	0	1,085,958
Morris	0	0	0	0	0	0	0	2,271	0	0	0	2,271
Ocean	17	0	0	0	0	397	4	22	18,058	532,113	0	550,611
Passaic	0	0	0	0	0	0	0	0	0	1	0	1
Salem	0	0	10	0	0	3,507	0	0	0	0	30,451	33,968
Somerset	0	0	0	0	0	0	0	109,938	1	0	0	109,939
Sussex	0	0	0	0	0	0	0	0	0	0	0	0
Union	0	0	0	0	0	60	0	343,889	0	120	0	344,069

(continued)	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	Total
Warren	0	0	0	0	0	0	0	0	0	0	0	0
New York	0	0	0	0	0	8,640	0	673,333	0	0	0	682,023
Pennsylvania	0	436,851	710,465	0	0	541,069	0	2,714	0	0	7,025	1,698,124
Delaware	0	0	30	0	0	670	0	0	0	0	0	700
Unk/Other	0	0	1,376	0	0	0	0	14,913	50	784	0	17,123
TOTAL	256,600	1,083,337	1,448,728	148,668	254,042	925,554	874,380	3,106,116	1,046,025	567,218	38,776	9,749,444

SOURCE: Bureau of Solid Waste Management, Department of Environmental Protection
County Disposal Data, 1974

TABLE 3
LIQUID WASTE FLOWS (GALLONS) IN COASTAL ZONE COUNTIES

Origin County \ Disposal County	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	Total
Atlantic	25,814,100	0	0	153,000	20,500	0	0	0	0	0	0	25,987,600
Bergen	0	0	0	0	0	33,750	97,083	239,846	0	0	0	370,679
Burlington	5,000	3,783,000	459,500	0	0	100,700	0	15,000	100	572,000	0	4,935,300
Camden	680,000	135,000	2,134,750	0	0	246,790	0	2,317,750	0	719,375	0	6,233,665
Cape May	456,000	0	947,500	2,846,400	0	0	0	0	0	412,000	0	4,661,900
Cumberland	0	0	0	0	26,423,660	8,000	0	0	0	50,000	7,000	26,488,660
Essex	0	0	0	0	0	107,000	0	152,975	0	0	0	259,975
Gloucester	0	0	14,843	0	12,000	3,853,876	0	130,000	0	0	23,400	4,034,119
Hudson	0	0	862,474	0	0	232,750	211,250	587,433	0	0	0	1,893,907
Hunterdon	0	0	0	0	0	0	0	5,000	0	0	0	5,000
Mercer	0	0	26,600	0	0	4,000	981,800	52,600	0	462,000	0	1,527,000
Middlesex	0	0	125,970	0	0	591,620	7,500	7,331,123	43,900	0	0	8,100,113
Monmouth	0	792,400	0	0	0	96,300	0	1,020,820	699,892	3,219,000	0	5,828,412
Morris	0	0	0	0	0	1,019,500	0	900,405	0	0	0	1,919,905
Ocean	2,000	13,700	0	0	0	183,200	0	2,815	0	1,654,467	0	11,856,182
Passaic	0	0	0	0	0	23,900	0	50,560	0	0	0	74,460
Salem	0	0	667,706	0	55,000	1,022,900	0	13,185	0	0	5,020,100	6,778,891
Somerset	0	0	0	0	0	256,300	0	1,850,626	0	0	232,000	2,338,926
Sussex	0	0	0	0	0	0	0	0	0	0	0	0

(Continued)

	Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Mercer	Middlesex	Monmouth	Ocean	Salem	TOTAL
Union	0	0	0	0	0	379,200	145,000	1,594,413	0	0	0	2,118,613
Warren	0	0	0	0	0	79,500	0	3,748,015	0	0	0	3,827,515
New York	0	0	0	0	0	3,890,000	0	1,159,960	0	0	0	5,049,960
Pennsylvania	0	0	2,902,566	0	0	7,860,104	1,875	920,258	0	0	0	11,684,803
Delaware	0	0	879,850	0	0	1,851,450	0	768,100	0	0	0	3,499,400
Unk/Other	210,000		22,110	0	0	1,907,000	0	24,752,736	0	0	0	26,891,846
Total	27,167,100	4,724,100	9,043,869	2,999,400	26,511,160	23,747,840	1,444,508	47,613,620	743,892	17,088,842	5,282,500	166,366,831

SOURCE: Bureau of Solid Waste Management, Department of Environmental Protection
County Disposal Data, 1974

Table 4 Existing and Proposed Solid Waste Facilities in the Coastal Counties

County	Sanitary Landfill		Compost Facility		Resource Recovery		Chemical Processing & Treatment Facility		Other Facility	
	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Prop.
Atlantic	27		1						1	
Burlington	27		3							
Camden	12	4	3							
Cape May	14	2	3		1					
Cumberland	20		2							
Gloucester	22	1					1			
Mercer	10		3						2	
Middlesex	30		4				3		2	
Monmouth	20		4							
Ocean	20						1			
Salem	19		1				1			
TOTAL	221	7	24		1		6		5	

Source: Bureau of Solid Waste Management, Department of Environmental Protection, Sanitary Landfill Directory, 5/25/76.

TABLE 5
EXPECTED REMAINING LIFE (IN YEARS) OF SANITARY LANDFILLS IN COASTAL ZONE COUNTIES:
1973 Data

County	Less than 3 years	3-5 years	6-10 years	11-15 years	16-20 years	21-25 years	More than 25 years	Unknown	Total
Atlantic	1		3	2	1		5	4	16
Burlington	2	5	5	2	2		1	1	18
Camden		3	2			1		1	7
Cape May		2	6			1	2	3	14
Cumberland	2	2	5	2	2	1			14
Gloucester		4	3		2	3	2	1	15
Mercer	1	1	1					4	7
Middlesex	1	5	5	2	5	1	6	1	26
Monmouth			4	3			2	3	12
Ocean		5	1	1			7		14
Salem	1	2	5		2	1	3	3	17
Total	8	29	40	12	14	8	28	21	160

SOURCE: Bureau of Solid Waste Management, Cooperative Project on Solid Waste Management with Glassboro State College, 1975.

Table 6

TYPES OF WASTES DISPOSED IN NORTHEAST COUNTIES IN 1974

(First 17 waste type categories are given in tons; second 6 waste type categories are given in gallons)

Waste Type Solid Waste	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Municipal	1,446,208	60,352	1,394,741	8,736	5,935	2,915,972
Institutional	4,898	6	22,715	0	0	27,619
Dry Sewage Sludge	0	0	110	0	0	110
Bulky Waste	37,970	2,589	86,430	0	175	127,164
Constr/Demo.	118,779	42,060	85,893	4,270	1,506	252,508
Dry Pesticides	0	0	250	0	0	250
Haz. Waste Cont.	0	0	0	0	0	0
Dry Haz. Waste	4	0	0	0	0	4
Dry Chem. Waste	1,912	0	9,902	0	0	11,814
Junked Autos	0	0	114,800	0	0	114,800
Tires	3,493	0	1,952	0	1	5,446
Vegetatives and Tree Wastes	42,156	672	13,904	1,520	3,155	61,407
Tree Stumps	5,888	85	742	0	46	6,761
Dead Animals	17	0	0	0	0	17
Food Proc. Waste	8,941	0	6,806	0	0	15,747

(con't)

Waste Type	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Solid Waste						
Oil Spill Cleanup	100	0	493	0	59,134	59,727
Indus. Non-chem.	240,262	4,252	1,048,308	0	209	1,293.031
TOTAL TONS	1,910,628	110,016	2,787,046	14,526	70,161	4,892,377
Liquid Waste						
Waste Oil	335,700	55,000	51,250	0	21,025	462,975
Semi Solid Waste Oil & Sludge	0	352,540	0	0	0	352,540
Bulk Liquid & Semi Liquids	0	0	7,721,915	0	0	7,721,915
Septic Tank Cleanout	2,056,000	1,573,000	10,552,510	0	0	14,181,510
Liq. Sewage Sludge	0	0	8,710,780	0	33,000	8,743,780
Liq. Pesticides Haz. Waste Liq. Chem. Waste Liq.	2,186,174	0	6,233,989	0	1,686,218	10,106,381
TOTAL TONS	4,577,874	1,980,540	33,270,444	0	1,740,243	41,569,101

Source: Bureau of Solid Waste Management, Department of Environmental Protection, County Disposal Data, 1974.

Table 7 Solid Waste Flows (Tons) in Northeast Counties

Origin/Disposal	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Atlantic	0	0	0	0	0	0
Bergen	1,476,160	0	541,081	0	0	2,017,241
Burlington	0	0	0	0	0	0
Camden	0	0	0	0	0	0
Cape May	0	0	0	0	0	0
Cumberland	0	0	0	0	0	0
Essex	143,329	102,729	473,165	0	94	719,317
Gloucester	0	0	0	0	0	0
Hudson	57,020	4,104	1,172,079	0	17	1,233,220
Hunterdon	0	0	0	0	0	0
Mercer	0	0	0	0	0	0
Middlesex	83	0	8,892	0	0	8,975
Monmouth	0	0	10	0	38	48

(con't)

Origin/Disposal	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Morris	6,501	0	30,895	0	0	37,396
Ocean	0	0	0	0	0	0
Passaic	211,535	200	263,673	5,790	0	481,198
Salem	0	0	0	0	1,325	1,325
Somerset	0	0	1,672	0	0	1,672
Sussex	0	0	0	0	0	0
Union	4,276	2,983	293,124	0	9,553	309,936
Warren	0	0	0	0	0	0
New York	1,030	0	2,120	8,736	0	11,886
Pennsylvania	0	0	0	0	0	0
Delaware	0	0	0	0	0	0
Unk/Other	14	0	335	0	59,134	59,483
TOTAL	1,899,948	110,016	2,787,046	14,526	70,161	4,881,697

Source: Bureau of Solid Waste Management, Department of Environmental Protection. County Disposal Data. 1974

Table 8 Liquid Waste Flows (Gallons) in Northeast Counties

Origin County \ Disposal County	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Atlantic	0	0	0	0	0	0
Bergen	2,153,956	3,000	2,830,261	0	20,000	5,007,217
Burlington	0	0	0	0	0	0
Camden	4,000	0	719,375	0	0	723,375
Cape May	0	0	0	0	18,725	18,725
Cumberland	0	0	0	0	0	0
Essex	1,104,400	29,100	2,140,800	0	10,000	3,284,300
Gloucester	0	0	0	0	0	0
Hudson	213,250	0	1,446,500	0	0	1,659,750
Hunterdon	0	0	0	0	0	0
Mercer	9,400	0	0	0	400,000	409,400
Middlesex	129,500	0	7,500		20,609	157,609

(con't)

	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Monmouth	0	0	4,535,000	0	0	4,535,000
Morris	2,000	512,000	7,492,310	0	0	8,006,310
Ocean	21,000	0	0	0	0	21,000
Passaic	104,000	382,000	4,929,877	0	300,000	5,715,877
Salem	9,120	0	0	0	0	9,120
Somerset	193,000	0	111,000	0	20,000	324,000
Sussex	0	2,000	10,000	0	0	12,000
Union	501,000	0	0	0	488,000	989,000
Warren	6,000	0	0	0	0	6,000
New York	0	0	2,225,000	0	451,300	2,676,300
Pennsylvania	127,248	352,440	230,716	0	11,609	722,013
Delaware	0	0	0	0	0	0

(con't)

	Bergen	Essex	Hudson	Passaic	Union	TOTAL
Unk/Other	0	700,000	6,592,105	0	0	7,292,105
TOTAL	4,577,874	1,980,540	33,270,444	0	1,740,243	41,569,101

Source: Bureau of Solid Waste Management, Department of Environmental Protection. County Disposal Data, 1974

Table 9 Existing and Proposed Solid Waste Facilities in the Northeast Counties

County	Sanitary Landfill		Compost Facility		Resource Recovery		Chemical Processing & Treatment Facility		Other Facility	
	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Proposed	Existing & closed	Prop.
Bergen	18		23	2	1					
Essex	7		10							
Hudson	9				2	1	1		1	
Passaic	5		1							
Union	3	1	3		3			1		
TOTAL	42	1	37	2	6	1	1	1	1	

Source: Bureau of Solid Waste Management, Department of Environmental Protection, Sanitary Landfill Directory, May 25, 1976.

TABLE 10
EXPECTED REMAINING LIFE (IN YEARS) OF SANITARY LANDFILLS IN NORTHEAST COUNTIES: 1973 DATA

	Less than 3 years	3-5 years	6-10 years	11-15 years	16-20 years	21-25 years	More than 25 years	Unkown	Total
Bergen	2	4	1	1		1		2	11
Essex	2							1	3
Hudson	2	2	1					2	7
Passaic	2	1	1						4
Union	1						1	1	3
Total	9	7	3	1	0	1	1	6	28

Source: Bureau of Solid Waste Management, Cooperative Project on Solid Waste Management with Glassboro State College, 1975.

APPENDIX D

DEFINITIONS

SOLID WASTES	DEFINITIONS*(see end of list)
Municipal (Household, Commercial)	Waste originating in the community consisting of household waste from private residences & commercial waste which originates in wholesale, retail or service establishments such as restaurants, stores, markets, theatres, hotels & warehouses. Any one truckload may include small quantities of other waste.
Institutional	Waste material originating in schools, hospitals, research institutions & public buildings. Laboratory waste & infectious wastes are not included in this category.
Dry Sewage Sludge	Sludge from a sewage treatment plant which has been digested and dewatered and does not require liquid handling equipment.
Bulky Waste	Large items of waste material such as appliances, furniture, large auto parts, whole trees, branches & tree trunks. Not included are items for which there is a specific waste category.

Construction and Demolition	Waste building materials & rubble resulting from construction, remodeling, repair & demolition operations on houses, commercial buildings, pavements and other structures.
Pesticides - Dry	A non-liquid chemical substance intended for use to control or manage insects, plant diseases, weeds & some other organisms troublesome to man.
Hazardous Waste Containers	Emptied containers that were used for the shipment and/or storage of Hazardous Waste.
Hazardous Waste-Dry	Non-liquid waste materials which are inherently dangerous to handle or dispose of. Included in this category are waste materials which are toxic, corrosive, irritating or sensitizing, radioactive, biologically infectious, explosive or flammable.
Chemical Waste-Dry-Non Hazardous	Non-liquid material normally generated by or used in chemical, petro-chemical, plastic, pharmaceutical biochemical or microbiological manufacturing processes that is not included in the hazardous waste or pesticide category.

SOLID WASTES (cont'd)	DEFINITIONS
Junked Autos	Discarded automobiles, trucks and trailers, usually devoid of easily-salvaged parts.
Tires	Discarded tires, in truckload quantities.
Dead Animals	Does not include the occasional dead animals included in municipal waste.
Leaves and Chopped Tree Waste	Tree wastes that have been processed through a wood chipper, or fallen leaves.
Agriculture Vegetative Waste	Waste materials from farms, plant nurseries, & greenhouses produced from the raising of plants. This waste includes such crop residues as plant stalks, hulls and leaves.
Tree Stumps	The part of a tree trunk remaining after the tree has been felled.
Food Processing Wastes	Processing waste materials generated in canneries, slaughterhouses, packing plants or similar industries.

Oil Spill Clean-Up Wastes	Wastes generated during an oil spill clean-up operation which include but are not limited to oil soaked sand and straw.
Industrial (Non-Chemical)	Solid waste materials resulting from the manufacturing industry. Specifically, not included is waste material of a chemical nature which is normally generated by or used in chemical, petro-chemical, plastic, pharmaceutical, biochemical or microbiological manufacturing processes, which has been selected for waste disposal & which is known to hydrolize, ionize or decompose, which is soluble, burns or oxidizes, or which may react with any of the waste materials which are introduced into the landfill, or which is bouyant on water, or which has a viscosity less than that of water or which produces a foul odor.

LIQUID WASTES	DEFINITIONS
Waste Oil	Automotive crank case drainings & other discarded free flowing oils from industrial, aviation & miscellaneous applications.

LIQUID WASTES (cont'd)	DEFINITIONS
Semi-Solid Waste Oils & Sludges	Waste oils and materials which are in the form of a highly concentrated slushy residue.
Bulk Liquid and Semi-Liquids	Liquid or a mixture consisting of solid matter suspended in a liquid media which is contained within, or is discharged from, any one vessel, tank or other container which has the capacity of 20 gallons or more. Included are bulk or semi-liquids for which there is not a specific waste category.
Septic Tank Clean-Out Wastes	Pumpings from septic tanks and cesspools. Not included are wastes from a sewage treatment plant.
Liquid Sewage Sludge	Liquid residue from a sewage treatment plant consisting of sewage solids combined with water & dissolved materials.
Pesticide Liquids	Chemical substance capable of flowing or of being poured intended for use to control or manage insects, plant diseases, weeds and some other organisms troublesome to man.

Hazardous Waste Liquids	Free flowing material which is inherently dangerous to handle or dispose of. Included in this category are waste materials which are toxic, corrosive, irritating or sensitizing, radioactive biologically infectious, explosive or flammable.
Chemical Waste Liquids	Free flowing material normally generated by or used in chemical, petro-chemical, plastic, pharmaceutical, biochemical or microbiological manufacturing processes. This material is known to hydrolize, ionize or decompose, is soluble, burns or oxidizes, or may react with any of the waste materials which are introduced into the landfill, or produces a foul odor. Not included is any chemical waste liquid for which there is a specific waste category.

*These definitions are utilized by the Bureau of Solid Waste Management of the Department of Environmental Protection.

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