

THE BOARD OF CHOSEN FREEHOLDERS

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November 30, 1976

To: Residents and Municipal Officials of Ocean County

I am very pleased to submit to you Volume II of the Ocean County Solid Waste Disposal and Resource Recovery Management Study. This report presents the Proposed Regional Solid Waste Disposal Management Plan for Ocean County and incorporates the findings of Volume I including existing solid waste systems and background information on Solid Waste.

The Ocean County Solid Waste Management Study was initiated by the Board of Chosen Freeholders by a resolution adopted on April 24, 1974. The study was prepared in accordance with the guidelines established in Senate Bill 624 (Chapter 326 Laws of 1975 approved on February 23, 1976), the County Solid Waste Planning and Management Act. The study was divided into two phases. The first phase consisted of compiling and evaluating data on existing solid waste management systems in the County; types of solid wastes produced; environmental and physical descriptions of the County; recycling activities in the County; legal, administrative and financial aspects of solid waste management; solid waste disposal management and planning constraints in the County and other background data on solid waste management. These materials were presented in Volume I of the study which was published in December 1975.

The second phase of the study dealt with the development of a recommended regional solid waste disposal management plan for the County. The plan is contained in this Volume II. The plan provides for a solid waste disposal strategy of acquiring two existing private landfill sites, upgrading the sites environmentally, phasing in two transfer stations on or near the two barrier beach islands, development of a staged resource recovery program, and elimination of disposal of wastes from outside the County. The proposed plan recommends a County owned and operated waste disposal system which will meet all environmental criteria established by State and Federal agencies, will meet administrative and operating criteria established by the Public Utilities Commission and will provide for a long-term solution to the solid waste disposal problem in Ocean County while providing for resource recycling and energy recovery capabilities and opportunities.

Adoption and implementation of a regional solid waste disposal management plan for Ocean County is mandated by the New Jersey Solid Waste Management Act. Ocean County however, has worked on developing a plan for more than two years and is aware of the importance of implementing a comprehensive, long-term plan to prevent future solid waste disposal problems.

On behalf of the Board of Chosen Freeholders and Mayors Committee on Solid Waste, I urge you to review the recommendations of the proposed plan contained in this report. While the final decision of implementing a County solid waste management plan rests with the Board of Chosen Freeholders, your input, recommendations and support of a long-term waste disposal plan are important if the plan is to succeed in terms of effectiveness, efficiency and environmental integrity.

Very truly yours,

Ernest A. Buhr
Freeholder-Director
EAB/cey



OCEAN COUNTY
SOLID WASTE DISPOSAL
AND
RESOURCE RECOVERY MANAGEMENT STUDY

VOLUME II:

PROPOSED REGIONAL SOLID WASTE
DISPOSAL MANAGEMENT PLAN
FOR OCEAN COUNTY

Prepared For

THE OCEAN COUNTY BOARD OF CHOSEN FREEHOLDERS
in cooperation with
THE MAYORS COMMITTEE ON SOLID WASTE

November 1976

Prepared By

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OFFICIALS FROM INDUSTRIAL, COMMERCIAL, INSTITUTIONAL,
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THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

THE NEW JERSEY DEPARTMENT OF LABOR AND INDUSTRY

THE NEW JERSEY DEPARTMENT OF PUBLIC UTILITIES

In addition, we offer a special thanks to Thomas A. Thomas, Director, and the staff of the Ocean County Planning Board for their assistance to A. Morton Cooper, Chairman of the Ocean County Environmental Agency and to the Ocean County Administrator, Mr. Charles M. Pike, for his overall guidance.



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I. INTRODUCTION

During the past decade, Ocean County has experienced rapid residential, commercial, and industrial growth. With this growth have come increasing quantities of solid waste which require efficient disposal. Many municipal officials, especially in the communities along the coast, have long recognized this problem. Solid waste disposal costs have escalated as haulage distances to distant landfill sites have increased. Many municipalities have limited landfill capacity remaining and poor prospects for acquiring new landfill areas locally.

Faced with these problems of ever-increasing solid waste quantities and dwindling areas for close-in landfill sites, many municipalities are finding it increasingly difficult and expensive to provide for proper solid waste disposal. With this in mind, the Ocean County Board of Chosen Freeholders initiated a county-wide solid waste disposal study in May 1974 with M. Disko Associates as solid waste consultant. The Ocean County Solid Waste Disposal and Resource Recovery Management Study is divided into two phases: (1) background and analysis (2) proposed regional solid waste management plan.

The basic objectives of the Ocean County Solid Waste Disposal and Resource Recovery Management Study are as follows:

- To define and explain in detail the natural, physical, and environmental conditions which exist in Ocean County and explain how these conditions interact in the formulation of a solid waste disposal management plan.

- . To define and explain in detail the types and categories of solid waste as they relate to Ocean County. To determine from which sectors of government, industry, and the public the waste quantities are generated.

- . To define the existing solid waste collection and disposal practices for the Ocean County municipalities. Every community was studied in depth to evaluate its collection and disposal system.

- . To define and evaluate the existing recycling programs in Ocean County.

- . To define and evaluate the legal, administrative, and financial aspects of solid waste collection and disposal.

- . To evaluate the potential markets for re-sale of salvagable components of municipal solid waste and to evaluate whether or not certain components should be recovered and marketed.

- . To review and explain in detail the current state-of-the-art of materials and energy recovery from municipal solid waste. Every new approach, as well as tried and true systems, were evaluated and described.

- . To define and explain in detail how the utilization of solid waste transfer stations can effectively reduce

haulage distances and municipal expenditures for solid waste disposal and to evaluate the suitability of utilizing transfer stations in Ocean County.

These objectives were achieved by Volume I of the Ocean County Solid Waste and Resource Recovery Management Study. Volume I is a 356 page comprehensive study of the existing collection and disposal practices of the County's 33 municipalities. In order to better understand the intent and direction of Volume I, some of the most important sections will be summarized in this report.

This report, Volume II, is a presentation of a proposed regional solid waste program for Ocean County. The program and plan has evolved over a period of two years and has included major input by the Ocean County Board of Chosen Freeholders, the Ocean County Planning Department, County Staff and advisory groups. This report was presented to the Board of Freeholders on November 24, 1976 and authorization was given for publication and distribution at that time.

II. SUMMARY OF EXISTING SOLID WASTE COLLECTION
AND DISPOSAL SYSTEMS IN OCEAN COUNTY

TYPES OF SOLID WASTES PRODUCED IN OCEAN COUNTY

The solid waste generated in Ocean County is comprised of many different components. "Solid Waste" is a general term used to describe many types of wastes including: garbage, trash, rubbish, clean-up wastes, yard debris, municipal debris, sewage treatment plant sludges, road sweepings, abandoned automobiles, and commercial, industrial, institutional and agricultural wastes. Generally, liquids such as chemicals, and semi-liquids from industrial operations are excluded from classification as solid wastes.

Typically, the components are wastes from residential, commercial, industrial, municipal and agricultural sources, including special wastes such as pathological, abandoned vehicles and clean-up wastes. The percentages of the components vary according to the time of the year, population fluctuations, weather conditions, etc.

In the spring months a large increase in lawn, leaf, and gardening wastes develops. Many municipalities conduct clean-up programs in the spring and early summer. Refrigerators, washing machines, and other bulky items are discarded during these times. The solid waste tonnages in the summer months increase dramatically. Officials in several municipalities reported a ten-fold increase in population and two municipalities reported a twenty-fold summer population increase. Obviously, as the population base increases, the solid waste quantities increase proportionally.

Residential solid wastes are typically composed of the throw-away wastes associated with day-to-day living. Residential solid wastes include wastes generated within the household, including paper, rubbish, and garbage, and wastes from the yard, including leaves, grass, hedge trimmings and branches, etc. It is from the residential solid waste collection that many recyclable components can be extracted. Table 1 shows the estimated analysis of residential solid waste in Ocean County.

Commercial solid wastes are generated by a number of non-manufacturing businesses which include offices and laboratories, wholesale and retail stores, hospitals and institutions, markets, theaters, etc. The composition of the wastes vary depending on the nature of the businesses. Generally, commercial firms have large percentages of paper, corrugated cardboard, metal and wood. Food packing plants or restaurants have major food scrap percentages. Many commercial waste generators are a valuable source of paper fiber suitable for reclamation.

Industrial generators dispose of a wide variety of solid wastes. Industrial solid wastes include discarded by-products of production, residues, and wastes from utility companies, transportation systems, communication firms, manufacturing firms, etc. They include shipping, office, plant packaging and cafeteria wastes. Chemicals, sludges, and dissolved or suspended solids in wastewaters are generally classified as liquid industrial waste. Industrial waste quantities are generally related to the number of employees and the type of manufacturing process. Some industrial

TABLE 1

ESTIMATED ANALYSIS OF RESIDENTIAL SOLID WASTE
COLLECTION COMPONENTS FOR OCEAN COUNTY

<u>COMPONENT</u>	<u>TYPICAL PERCENTAGES</u>	
	<u>Rural Sections of the County</u>	<u>Urban Areas of the County</u>
<u>DIRT</u>	2%	2%
<u>GARBAGE:</u> Food Wastes, Fats, Meat Scraps, Rinds and Seeds, Vegetable Wastes	20%	12%
<u>GLASS:</u> Bottles, Ceramics	14%	10%
<u>METALS</u>	10%	11%
<u>PAPER:</u> Corrugated, Mail, News- papers, Kraft, Magazines, Cartons, Tissues	40%	42%
<u>PLASTICS</u>	4%	4%
<u>TEXTILES</u>	1%	2%
<u>WOOD</u>	2%	1%
<u>YARD</u> Leaves, Grass, Branches <u>WASTES:</u> Garden Plants	2%	13%
<u>MISCELLANEOUS</u>	5%	3%
TOTAL	100%	100%

SOURCE: Studies by M. Disko Associates in Hunterdon, Monmouth, Passaic, Union, and Ocean Counties, including sampling programs to categorize and weigh household wastes. Percentages should be considered as typical, but may vary in a particular municipality.

firms practice continual recycling of all or part of their wastes. In addition, some of the larger industrial facilities dispose of all of their solid wastes on their own property.

Table 2 lists a comparison of the three major waste sources, residential, commercial and industrial, on a waste component basis.

As previously mentioned, there are several other sources of solid waste that make up the total amount requiring disposal daily. Many municipalities generate large quantities of clean-up waste and leaves during certain periods of the year. In addition, many municipalities are forced to remove and dispose of abandoned automobiles.

EXISTING SOLID WASTE COLLECTION AND DISPOSAL SYSTEMS IN OCEAN COUNTY

Ocean County's municipalities utilize three types of solid waste collection systems. Figure 1 illustrates the distribution of the types of collection systems. The municipal collection system, which uses municipal workers and trucks to collect the solid waste is used by the following municipalities: Beach Haven, Beachwood, Berkeley, Brick, Dover, Eagleswood, Island Heights, Lacey, Lakehurst, Lakewood, Lavallette, Little Egg Harbor, Ocean Gate, Pine Beach, Point Pleasant Beach, Seaside Heights, Seaside Park, Ship Bottom, South Toms River, Stafford, Surf City, and Tuckerton.

The municipally-contracted collection system involves a private contractor hired by the municipality to provide collection and

TABLE 2

TYPES OF RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL
SOLID WASTES IN OCEAN COUNTY

<u>COMPONENTS</u>	<u>PERCENT FROM RESIDENTIAL SOURCES</u>	<u>PERCENT FROM COMMERCIAL SOURCES</u>	<u>PERCENT FROM INDUSTRIAL SOURCES</u>
PAPER	41.0	45.0	22.5
PLASTIC	4.0	6.8	1.8
METAL	10.5	3.9	7.9
CERAMIC	0.0	0.3	0.7
ORGANIC CHEMICALS	0.0	0.0	13.5
INORGANIC CHEMICALS	0.0	0.0	0.2
GLASS	12.0	1.7	0.7
FOOD WASTES	16.0	17.8	25.2
TEXTILES	1.5	0.2	0.7
WOOD PRODUCTS	1.5	5.3	21.8
LEATHER	0.0	0.0	0.3
RUBBER	0.0	2.4	0.4
MIXED COMMERCIAL	0.0	1.7	0.5
PETROLEUM PRODUCTS	0.0	0.5	0.4
STONE, SAND, PLASTER	2.0	1.0	3.2
OTHER WASTES	<u>11.5</u>	<u>13.4</u>	<u>0.2</u>
TOTAL	100.0	100.0	100.0

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

RESIDENTIAL SOLID WASTE COLLECTION SYSTEMS

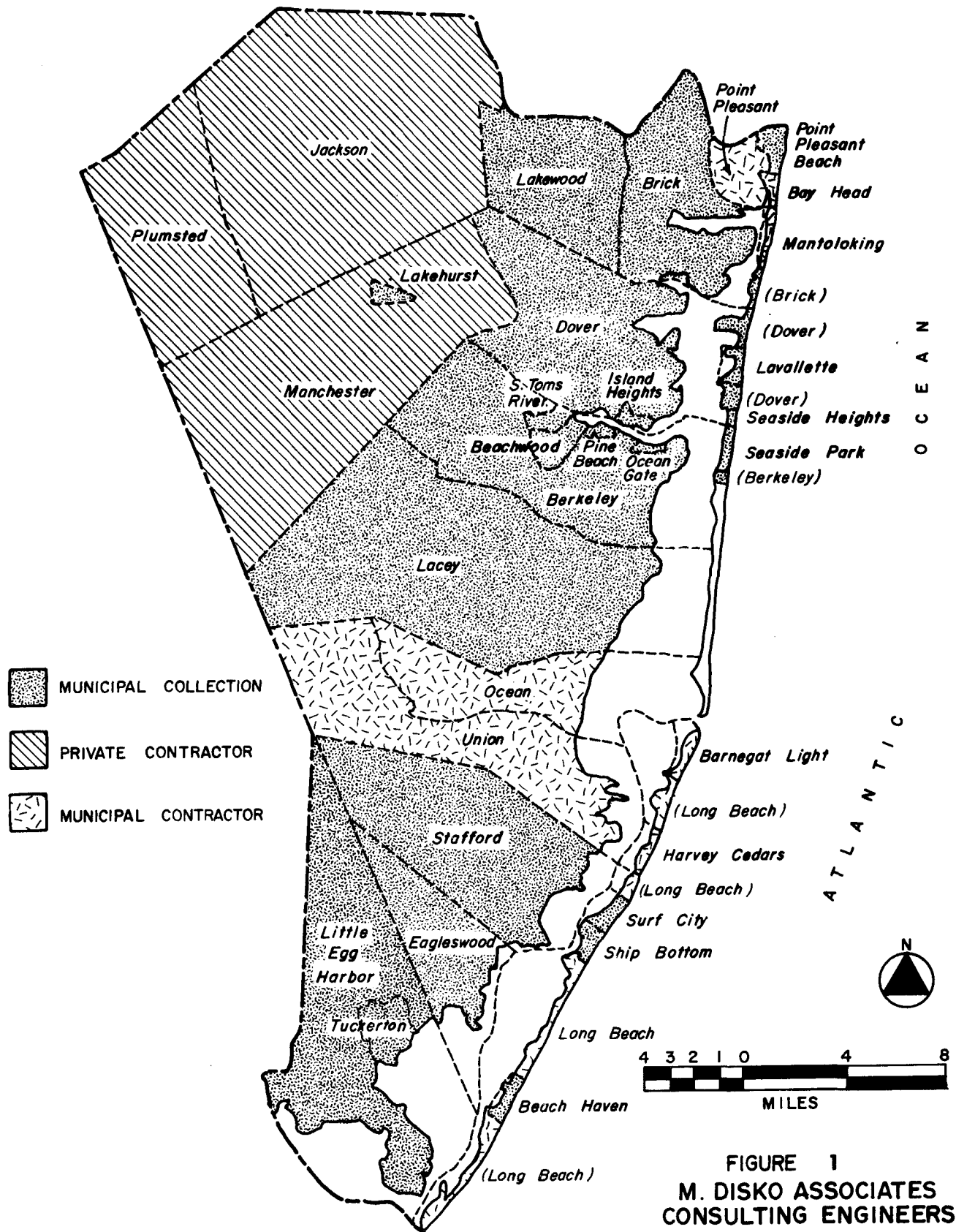


FIGURE 1
M. DISKO ASSOCIATES
CONSULTING ENGINEERS

disposal services to the entire municipality. The following municipalities use this system: Barnegat Light, Bay Head, Harvey Cedars, Long Beach, Mantoloking, Ocean, Point Pleasant, and Union.

Three communities, Jackson, Manchester and Plumsted, require the individual property owners to contract with a private contractor for refuse collection and disposal. With this private contractor system, the municipality does not become involved in the waste collection process.

As previously explained, Ocean County utilizes three basic solid waste collection systems. However, there are many variations in these three systems concerning frequency of collection during the week, curb or backyard pick-up, clean-up weeks, etc. Therefore, when comparing the costs for solid waste collection and disposal between municipalities, the level of service must first be determined to insure that the systems are providing comparable services. That is why there is such a large range in costs for the municipalities as outlined in the table below. The estimated per capita costs are calculated with a weighted population figure which compensates for the vary large population and waste quantities during the ten week summer season.

<u>TYPE OF COLLECTION</u>	<u>NUMBER OF MUNICIPALITIES</u>	<u>1974-1975 RANGE OF ESTIMATED COST PER YEAR PER CAPITA</u>
Municipal, curbside	20	\$ 3.34 - \$31.06
Municipal, backyard	2	\$10.35 - \$12.40
Contract, curbside	6	\$13.48 - \$16.79
Contract, backyard	2	\$30.81 - \$55.14
Private, curbside	3	\$12.82 - \$20.63

An important task when planning a solid waste disposal strategy is to estimate the quantities of solid waste generated each day in the County. This is often a difficult and complex task because many municipalities have limited records of their collected tonnages. Solid waste collections vary because of seasonal or holiday influences. In the shore communities, peak summer tonnages may go up 10 to 15 times over the non-peak winter quantities. The estimates presented below must be considered as having a 10 to 15 percent, plus or minus, accuracy. The values were obtained from municipal officials, contractors, engineering computations, and the records of the New Jersey Department of Environmental Protection and the New Jersey Public Utility Commission.

<u>COMPONENT</u>	<u>1974-75 ESTIMATED TONS/YEAR</u>	<u>1974-75 ESTIMATED AVERAGE TONS/WEEK</u>	<u>1974-75 ESTIMATED PEAK TONS/WEEK</u>
Residential	292,500	5,625	10,500
Non-Residential Municipal	17,900	344	500
Commercial	127,500	2,452	4,021
Industrial	99,000	1,904	2,000
Agricultural	3,000	58	100
County Totals*	539,900	10,380	17,100
*Totals - Rounded			

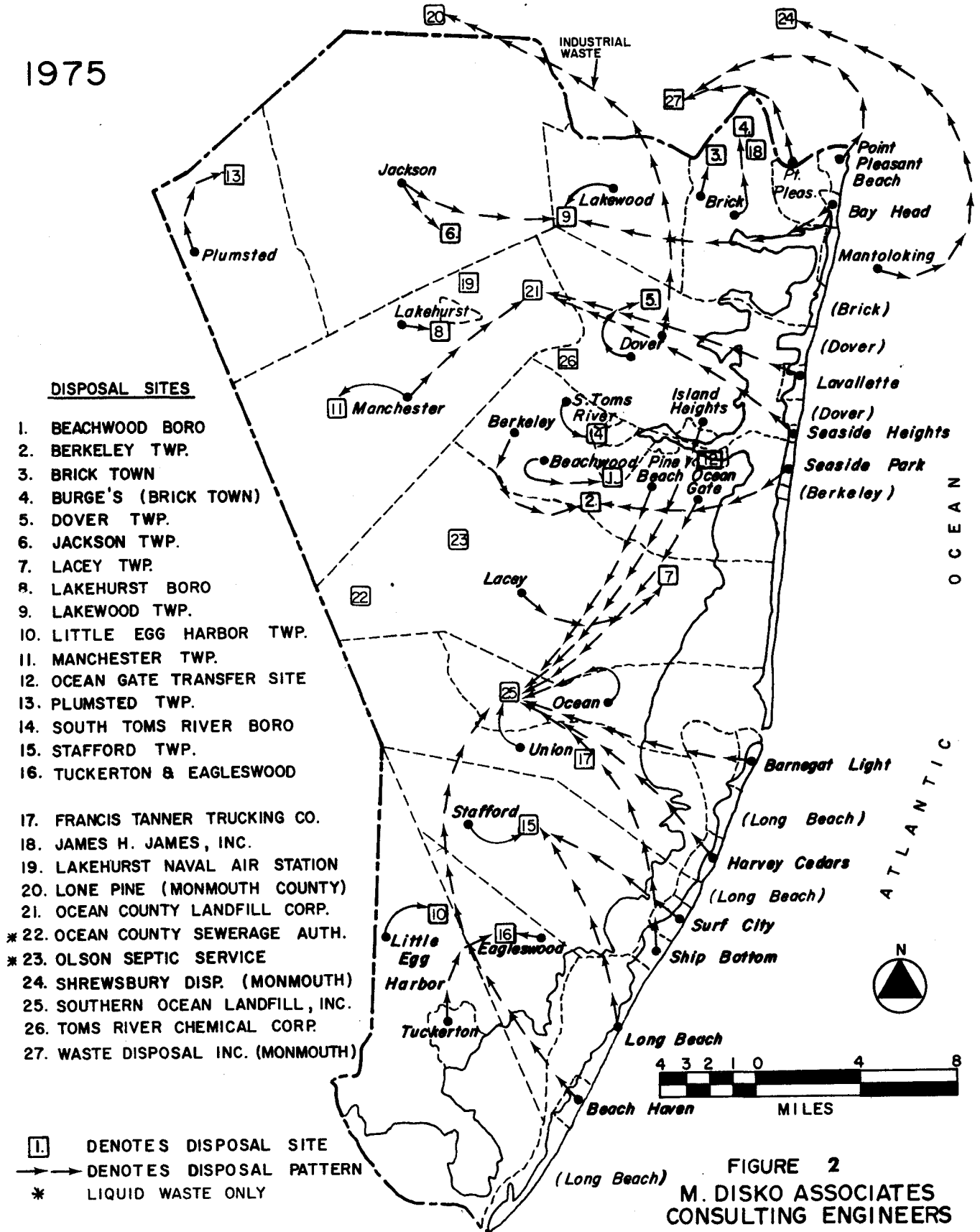
The overwhelming percentage of Ocean County's commercial and industrial solid waste and all of its residential solid wastes are hauled to landfills for disposal. There are 15 municipally operated landfills in the County. In addition, solid waste is also hauled to 2 private landfills in the County and 3 private landfills in Monmouth County. There are also 4 private industrial landfills located in the County that are not open to the general public. Figure 2 illustrates the patterns of solid waste disposal during 1974-1975.

Some of the County's landfills, notably Brick and Dover Townships, have very limited landfilling capacity remaining. Every existing landfill in the County will come under very close scrutiny by the New Jersey Department of Environmental Protection. Many of these smaller landfills are very poorly run and will be forced to close when confronted with the required capital expenditures to upgrade their operations. As landfills begin to close, the wastes will

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

SOLID WASTE DISPOSAL SITES UTILIZED BY OCEAN COUNTY MUNICIPALITIES

1975



have to be transported to other landfills in the County. This new influx of wastes to existing fills will have the effect of reducing their life by increasing their daily tonnage. The net result will be a domino effect of one landfill after another closing until there will be a disposal crisis in the County.

Another very serious problem in Ocean County concerns disposal of solid wastes from the shore communities on Long Beach Island and Island Beach. Historically, these communities have had to haul their solid wastes long distances to inland landfills. These shore municipalities are faced with ever escalating haulage distances and costs.

EXISTING RESOURCE RECOVERY PROGRAMS IN OCEAN COUNTY

Ocean County has large components of potentially recyclable or re-usable materials in its solid waste, as the following table shows:

<u>TYPE OF SOLID WASTE</u>	<u>TYPICAL PERCENTAGE</u>		
	<u>PAPER</u>	<u>METAL</u>	<u>GLASS</u>
Residential	41%	11%	12%
Commercial	45%	3.9%	1.7%
Industrial	22.5%	7.9%	0.7%

In 1974-1975 eleven municipalities engaged in some form of recycling activities. These municipalities were: Beach Haven, Brick, Dover, Jackson, Lakewood, Lavallette, Pine Beach, Point Pleasant, Point Pleasant Beach, Seaside Heights, and South Toms River. The Ocean

County Girl Scout Council also was involved in recycling activities. The recycling activities in Ocean County could be expanded to other municipalities if a county-wide disposal system was instituted.

III. CRITERIA FOR SOLID WASTE DISPOSAL MANAGEMENT PLANNING IN OCEAN COUNTY

GENERAL CRITERIA

Development of a viable plan for an environmentally acceptable and cost efficient solid waste disposal plan for Ocean County requires consideration of a number of planning constraints. Briefly, some of these constraints include: 1) public attitudes towards solid waste management, 2) increasing solid waste quantities, 3) existing solid waste disposal systems in the County, 4) the legal and administrative systems available, 5) the technology of solid waste disposal, and 6) environmental constraints. The importance of understanding the planning constraints which impact Ocean County cannot be overstated, for it is only by working within these constraints that an effective solid waste disposal management plan can be implemented.

In Volume I, those factors impacting solid waste management in Ocean County, including an analysis of existing solid waste collection and disposal systems, markets for recyclable materials, existing recycling activities, legal and administrative structures available for solid waste management, etc., have been identified and developed. In this Volume II report, those factors will be brought together in an effort to establish the parameters in which a comprehensive solid waste disposal system can be implemented in Ocean County.

The following key points summarize general policy considerations required for a successful solid waste disposal plan in Ocean County.

1. In order to implement a comprehensive solid waste management plan, the plan must be capable of overcoming public opposition to the location of a proposed solid waste disposal facility.
2. The proposed solid waste disposal system must have the capability of handling increasing amounts of solid waste in the future.
3. A comprehensive county-wide solid waste disposal plan must take into consideration the existing landfills within Ocean County. A county-wide system must allow gradual phase-out of smaller landfills as municipalities join a county system.
4. A county-wide solid waste plan must be founded upon the most practical administrative system available in order to make the system responsive, flexible and economically competitive.
5. Solid waste technology is in a state of continuing development. Disposal methods that have been sufficiently tested and developed to provide effective and efficient solid waste processing and disposal should be utilized in a county-wide plan. A cost effective system should be chosen for a county-wide disposal plan.
6. In developing a solid waste management plan for Ocean County, primary emphasis must be placed on protecting the County's valuable natural resources, including the groundwater aquifers, and ensuring that environmental quality standards are maintained.

7. Future solid waste disposal activities should point toward resource recovery in the future as technology develops.

PUBLIC ATTITUDES TOWARDS SOLID WASTE MANAGEMENT

Historically, public opposition to the location of a solid waste disposal facility, no matter how well the facility is planned, is usually strong enough to prevent the locating and constructing of new disposal facilities. It seems everyone is in favor of having a site set aside for solid waste disposal, but no one wants it in their area or municipality. Hence, after one site is rejected by a municipality because of local opposition, a precedent is set whereby other municipalities then in turn refuse to allow the facility to be constructed in their community. Thus, in order to implement a comprehensive solid waste management plan, the plan must be capable of overcoming public opposition to the location of a proposed solid waste processing and/or disposal facility.

One method of reducing public opposition to proposed disposal site is to utilize an existing landfill. A community that is already used to having a number of collection trucks on certain streets around the existing landfill facility may react favorably if Ocean County purchases and upgrades the facility. In all probability County operation of a facility will upgrade the environmental safeguards taken in the operation and will be more responsive to the needs of the host municipality. The County may offer concessions to the host municipality in lieu of taxes.

INCREASING SOLID WASTE GENERATION

Ocean County is experiencing rapid residential, commercial and industrial growth. Since 1960, the County's population has increased by about 150 percent. In fact from 1970 to 1974, the population increased by almost 50,000 people. This population increase has accelerated the construction of residential dwellings, new schools, shopping centers, recreational facilities, sewage treatment, and transportation systems. This rapid growth has, of course, been matched by a proportionate increase in solid waste quantities.

The development and design of a county-wide solid waste disposal strategy must take into consideration the increasing solid waste quantities. In addition, Ocean County has a unique problem in that during the summer tourist months of June, July and August, there is a very large increase in population and hence solid waste production. Any new system must be capable of efficiently handling this peak solid waste load.

CONSIDERATION OF EXISTING LANDFILL OPERATIONS

As Figure 2 illustrates, Ocean County has a number of existing municipal sanitary landfills and two major private landfills. This has the effect of essentially keeping the solid waste generated in Ocean County within the County. When any new disposal system is proposed, it must have the flexibility to operate with only a portion of the County's solid waste load. Many municipalities may, initially, choose not to enter into an agreement with the

County for disposal services, but rather may continue to utilize their own facilities. This, of course, will become an increasingly difficult proposition because new environmental standards will make upgrading a small sanitary landfill an expensive proposition for a municipality.

A regional solid waste disposal strategy for Ocean County must have the flexibility to allow the various municipalities in the County to enter the disposal system as they desire to phase-in.

The capital construction of subsequent phases of resource recovery would depend on how many municipalities become part of the system. The system must, however, operate satisfactorily to handle the needs of those municipalities desiring immediate disposal services.

LEGAL AND ADMINISTRATIVE CRITERIA

As noted previously in Volume I, the State Solid Waste Management Plan has identified the County as the basic solid waste processing and disposal district in New Jersey. Subsequently, the "County Solid Waste Disposal Financing Law", citing the inability of individual municipalities to finance and construct solid waste processing and disposal facilities themselves, empowered New Jersey county governments to issue general obligation bonds to finance the construction and development of regional solid waste management facilities.

Legislation enacted since 1970 has empowered County Municipal Utility Authorities (M.U.A.) and County Improvement Authorities to issue revenue bonds for the construction of solid waste processing

and disposal facilities. A recent law (Chapter 326)* identifies the County as the basic solid waste management district and requires that each County Board of Chosen Freeholders develop and implement a regional solid waste management plan.

In order for Ocean County to operate a disposal system, an adequate administrative system with requisite financial, jurisdictional, legal, and operational capability would be required. Some of the requirements of the administrative structure include the following:

- . The administrative structure must have sufficient financial capabilities.
- . It must service a population sufficient to reduce the unit costs of solid waste disposal and to plan, develop, and operate on a county-wide basis.
- . It must be able to acquire property.
- . It should have control over the sources, types, and quantities of solid wastes that are discharged into the processing and disposal system.
- . It should have the necessary personnel and equipment to perform its duties.

Currently, there are six administrative structures available for regional solid waste management in Ocean County including the following inter-municipal and county-level structures:

*Adopted as Chapter 326 Laws of 1975. Solid Waste Management Act

LEGISLATIVE BASIS OF
ADMINISTRATIVE STRUCTURE

TYPE OF REGIONAL SOLID
WASTE SYSTEM PERMITTED

Incinerator Authorities
Law of 1948

One or more municipalities may
create Incinerator Authority

Solid Waste Management
Authorities Law of 1968

One or more municipalities may
create Solid Waste Management
Authority

Joint Service Contract
(N.J.S.A. 49:48B-1)

Joint Meeting between two or
more municipalities

County Solid Waste Disposal
Financing Law

County department or agency

County Municipal Utilities
Authority Law

County Utilities Authority
established by Freeholders

County Improvement
Authorities Law

County Improvement Authority
established by Freeholders

These legal and administrative structures, identified in Volume I, establish specific parameters within which a county-wide solid waste management system can be implemented. Because of the available legal and administrative options, each option must be evaluated in terms of its ability to identify and implement practical solutions to solid waste management problems in Ocean County.

ENVIRONMENTAL CONSIDERATIONS

Ocean County places an emphasis on environmental quality and control. Any new solid waste disposal system cannot contribute to the degradation of any aspect of the environment. Ocean County depends entirely on groundwater for its potable water supply. Hence, anything that would have the slightest tendency to contaminate this water supply must be studied in great detail. To complicate

matters, Ocean County's geologic structure is composed almost entirely of Cohansey Sand, a relatively poor barrier to infiltration of contaminants. To understand the complex interaction of the physical, natural and environmental conditions and more importantly how these conditions are affected by solid waste disposal systems, a complete study of the conditions is necessary.

Obviously, it is the geologic layers that are the barrier between the important groundwater and potential surface pollution. The more impermeable the material, that is the more it resists the seepage of water through it, the safer the groundwater is from surface pollution.

Other major natural conditions which must be carefully studied include the soils, topography, drainage, water supply and climate. In addition, many physical conditions such as existing wastewater treatment plants, other sources of pollution discharge and the intricate highway transportation system must be reviewed. These physical, natural, and environmental constraints are important because it is only by working within these constraints that a successful Ocean County solid waste disposal plan can develop and be successful from an environmental point-of-view.

TECHNOLOGY OF RESOURCE RECOVERY AND SOLID WASTE DISPOSAL

In light of recent fuel and material shortages, a new emphasis has been placed on recovering and utilizing valuable resources in solid wastes that have traditionally been discarded, buried, and lost. Increasingly, solid waste is being considered as a

source of material and energy recovery. With this new awareness has come a concerted effort on the part of business, industry, and government to develop the technology for recovering these resources from solid wastes.

The development of solid waste disposal and processing technology has advanced to a point where it is now technically feasible to separate many valuable components of solid waste for resale to secondary materials dealers. Ferrous metal, aluminum, paper for fuel, and glass can be readily reclaimed from solid waste. The techniques have been used for years in other industries. As more and more material is subsequently reclaimed, the portion of the total waste that requires ultimate land disposal is reduced. The trend is toward systems which can recover and reclaim valuable materials and energy from the refuse.

The vast majority of the equipment, technology, and concepts used in resource recovery are not new, however. They have been tried and tested in other industries before being adapted for solid waste processing.

The state-of-the-art of solid waste disposal in this Country has advanced significantly in the last decade. The sanitary landfill, while still currently the predominant method of solid waste disposal, is not going to be acceptable in the future in developed areas.

Fortunately, major new methods of solid waste disposal are being developed, constructed, and tested throughout the Country. Processes such as high temperature incineration, pyrolysis, materials recovery, and energy recovery are beginning to solve the solid waste problem.

An additional advantage to a materials recovery type of operation is that the various recovery operations can be phased in gradually over a period of time. For example, a regional facility can start by having a sanitary landfill operational to receive the daily tonnages that require disposal each and every day. Then, a front-end shredding facility can be constructed. As more and more tonnage enters the facility, the more sophisticated phases of metals, plastics and glass recovery can be added.

While there have been great strides made in developing resource recovery technology, there are few full-scale operating plants in the United States. Thus, a careful evaluation of solid waste technology must be made to ensure that the equipment can and will meet solid waste disposal requirements in Ocean County in the future, prior to the expenditure of large amounts of public capital.

MARKETS FOR MATERIALS RECOVERED FROM OCEAN COUNTY'S SOLID WASTE

While the technology for separating and reclaiming certain components of solid waste, such as ferrous metals, glass, paper, and fuel is present today, these materials are of little value if there are not markets in which to sell the materials. Therefore, it is very

important that a county investigate the potential market for recovered materials in the State prior to initiating resource recovery activities. Some of the markets investigated in the Volume I report were paper, ferrous metal, non-ferrous metals, textiles, rubber, plastics, glass and energy.

Paper and paperboard represent the largest single component of municipal solid waste. By 1980, consumption is expected to be greater than 85.0 million tons. The use of paper and wood that has been separated from solid waste as an energy source is a concept that is finding widespread acceptance throughout the Country.

The market for ferrous metal in New Jersey is good. Ferrous metal is one of the easiest materials to separate from solid waste. There are many installations throughout the Country that use magnetic drums and belts to separate the ferrous fraction from the solid waste.

While it appears that secondary markets are available for many of the materials found in solid waste, it is imperative that any proposed resource recovery system have the capability of meeting the quality and quantity requirements of the secondary materials markets.

COST AND DEPENDABILITY OF SERVICE

Solid waste management costs are subject to inflationary trends. Costs of collecting and disposing of solid wastes have been in-

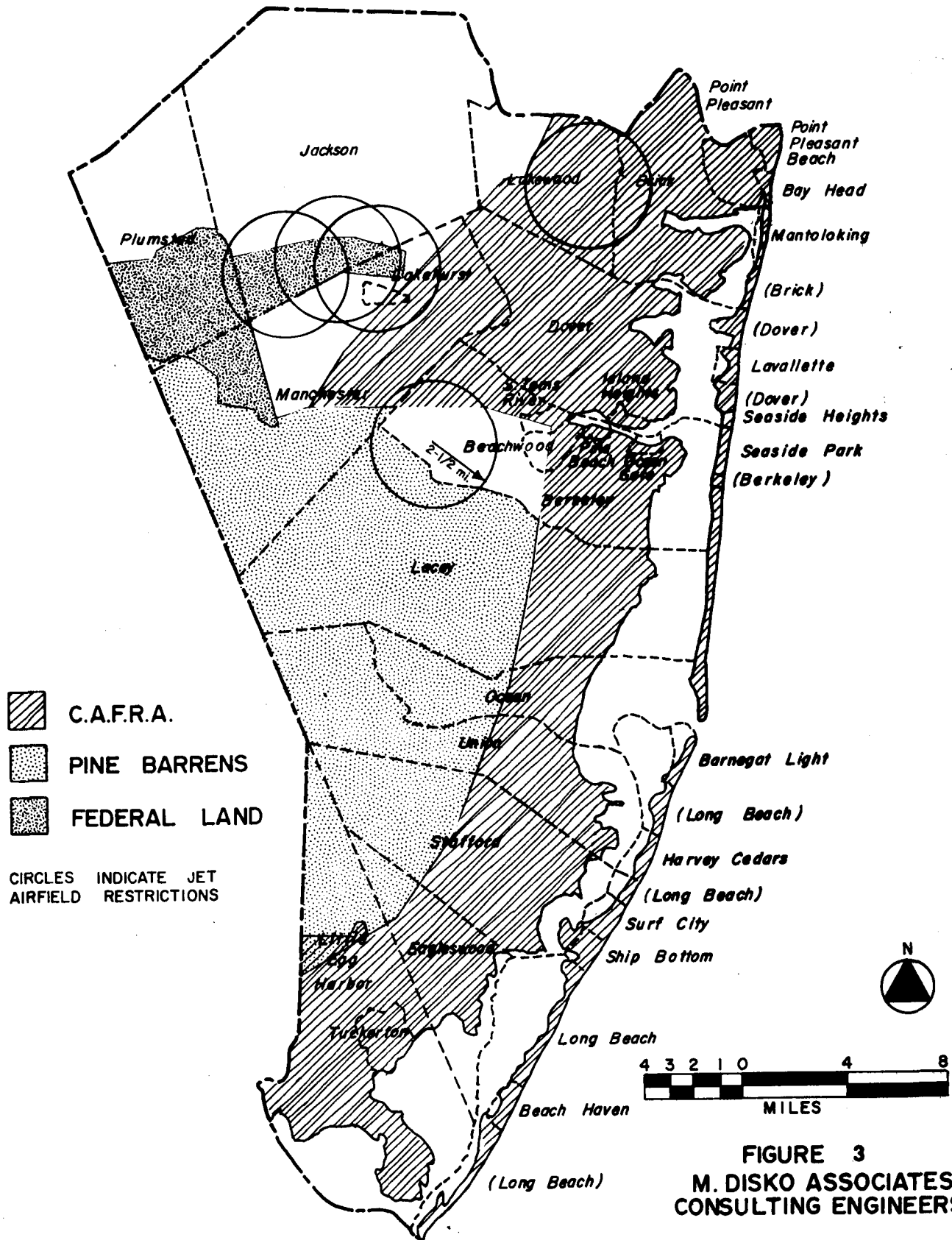
creasing over the years. While public officials and the general public desire to keep these expenditures to a minimum, the fact remains that, with increased operating costs brought about by inflation, rising fuel and power costs, and more stringent environmental standards, solid waste management costs will increase in the future. The development of a regional, county-wide solid waste disposal plan in Ocean County will help to stabilize solid waste disposal costs and to insure long term dependability of service.

CONSTRAINTS IMPACTING LOCATION OF SOLID WASTE DISPOSAL FACILITIES IN OCEAN COUNTY

Ocean County has several unique factors that impact the locating of a solid waste disposal facility. The Coastal Area Facilities Review Act, the Pine Barrens, and Federally owned land, as shown in Figure 3, encompass a large percentage of the County's open undeveloped land. The Pine Barrens and C.A.F.R.A. are areas of environmental sensitivity and require some degree of environmental protection. Also, as shown on Figure 3, the New Jersey Department of Environmental Protection restricts new solid waste disposal facilities within 2-1/2 miles of an airport accepting jet aircraft, in order to eliminate the hazard of birds entering jet aircraft engines.

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

SEVERAL CONSTRAINTS PLACED ON LAND SITE SELECTION



IV. PROPOSED REGIONAL SOLID WASTE DISPOSAL PLAN
FOR OCEAN COUNTY

THE GENERAL PLANNING PROBLEM

Of the 33 municipalities in Ocean County, only 15 municipalities have their own sanitary landfill facilities for solid waste disposal. Several municipalities are rapidly running out of usable space at their landfills. Most of the municipal landfills face severe economic problems in the near future as more stringent regulations are developed by the New Jersey Department of Environmental Protection. The economic costs associated with landfill upgrading, monitoring wells and testing, cover requirements, leachate collection and disposal, and other generally necessary environmental requirements will be prohibitive for many municipalities.

In the private sector, there are two major sanitary landfills in the County: Ocean County Landfill Corporation in Manchester, and Southern Ocean Landfill, Inc., in Ocean Township. These private landfills face numerous problems including economic pressures due to environmental regulations. In addition, these private landfills have had difficulty in generating a volume of business in solid waste disposal because of the numerous municipal landfills which exist. The private landfills have had to solicit and encourage importation of solid wastes and/or septic sludges from out-of-county areas.

In the more populated coastal municipalities, a common problem is the lack of available marginal land for a sanitary landfill or for

solid waste disposal facilities. In addition, in most municipalities the proposed construction of a new sanitary landfill or other type of disposal facility is usually vigorously opposed by vocal groups as well as some municipal officials. The position usually taken is that such facilities should be located in some other municipality.

The basic solid waste problem in Ocean County does not center around solid waste collection services. Existing collection services in Ocean County, municipal or contractor provided, are, in general, rated good to excellent, compared to other areas in Northern, Central, and Southern New Jersey. Problems in solid waste management are not collection related, but are concerned with the long-term reliability of disposal facilities, environmental acceptability of disposal practices, and in the total economic costs of solid waste disposal.

A major planning factor to consider in the future is an increase in solid waste quantities. Projections were made in Volume I concerning future tonnage rates of solid wastes. While these projections are subject to changes in population figures, and to a small degree to changes in per capita or per employee solid waste generation rates, the clear pattern is that solid waste quantities will continue to increase substantially in Ocean County. Table 3 presents a summary of solid waste projections for the years 1980 and 1990 based on future estimates of population and commercial and industrial development.

TABLE 3

PROJECTIONS OF SOLID WASTE QUANTITIES

<u>ITEM</u>	<u>1974-75</u>	<u>Y E A R</u> <u>1980</u>	<u>1990</u>
Estimated Population	257,785	340,375	491,690
Solid Waste Quantities			
Residential	292,500	409,000	682,000
Commercial	127,500	173,000	262,000
Industrial	99,000	135,000	203,000
Agricultural	3,000	3,000	2,500
Municipal	<u>17,900</u>	<u>27,500</u>	<u>51,000</u>
	539,900 tons/year	747,500 tons/year	1,200,500 tons/year
	or	or	or
	1,479 tons/day	2,050 tons/day	3,300 tons/day

REFERENCE: Ocean County Solid Waste Disposal and Resource
Recovery Management Study, Volume I, December
1975, by M. Disko Associates, Consulting Engineers

A critical factor in the planning of a regional solid waste disposal facility, perhaps as critical as the availability of acceptable vacant land and public acceptance factors, is the need for economic control of the solid wastes within a county or regional planning area. In the current market place, the disposal method of choice for a given municipality or solid waste contractor is selected on a least-cost basis. Technologically advanced disposal methods, at a higher cost per ton of refuse, cannot economically compete with current \$2.60 to \$4.00 per ton landfilling. No credit is usually given by the contractor or municipality for environmental benefits, for reduction of visual objectionableness, for reduction of public health hazards, etc., for a technologically advanced disposal method. Simply stated, economic control of solid waste disposal is the contractual right, by franchise or municipal contract, or the economic right due to lack of competition, to determine the nature and type of solid waste disposal in a planning area such as Ocean County. Without this "control", no advanced system for solid waste disposal by controlled sanitary landfilling and/or resource recovery can be economically viable in competition with "cheap" landfilling.

Contractual relationships can be made between a county or solid waste authority and individual municipalities to mandate utilization of a specific disposal facility. Control of franchise rights rests, by law, with the Public Utilities Commission.

In spite of the problems described above, the long-term best

interests of Ocean County are served by the development of an efficient and reasonable county-wide solid waste plan. Land costs increase each year; more vacant land becomes developed each year. The pressures of solid waste disposal in the coastal municipalities continue to increase. Furthermore, the recent passage into law of Senate 624, which mandates the development of county solid waste management plans, forces the County to act to plan a regional system.

FAILURE OF A PREVIOUSLY PROPOSED PLAN FOR A DISPOSAL FACILITY
IN LACEY TOWNSHIP

During the spring and summer of 1975, a proposal for a county-wide solid waste disposal and resource recovery facility to be located off of Lacey Road in Lacey Township was advanced. The proposed facility would have reclaimed several hundred acres of previously strip-mined land by sanitary landfilling. A front-end shredding plant would have been the first stage of a future resource recovery facility. The facility was centrally located in Ocean County and could have been combined with two transfer stations, one in the northern part of the County and one in the southern part to effectively reduce haulage costs and traffic.

Land for the proposed facility could have been purchased for approximately \$1000. per acre. A new facility would not have any old environmental problems left over from a previous landfilling operation. As a result of local apprehension and opposition, the proposal was scrapped in October 1975.

A PROPOSED SOLID WASTE DISPOSAL STRATEGY FOR OCEAN COUNTY

The failure in trying to locate a new solid waste disposal facility in Lacey Township, now precludes the selection of any new site. Experience in other counties shows that when local opposition achieves the rejection of the first site or plan suggested, local opposition to the next site increases. The net result is a series of rejected sites and the inability to achieve any type of county-wide plan. When this occurs a period of up to five years have to elapse before this issue can be reopened again

The utilization of existing private or public sanitary landfills located in Ocean County for a county-operated system, can eliminate many of the problems associated with selecting a new facility. Provided that an existing facility is well located and large enough to handle a county operation, there are many advantages to utilization of an existing landfill facility. Public opposition is minimized because the facility is existing. Transportation patterns are already established. The facility already draws collection trucks along particular routes and the addition of more trucks is not viewed with great opposition. In addition, chances are many municipalities are already hauling their wastes to these existing landfills. The facility is a known quantity and does not generate a fear of unknown evils and maladies among local residents. In point of fact, a County takeover would make available the capital necessary for an environmental upgrading of the existing landfill operations with a resulting benefit to the local residents.

In Ocean County there are two large privately-operated landfills that currently accept residential waste from many of the County's municipalities and would be ideal for a county-operated system. The Ocean County Landfill Corporation on Route 571 in Manchester Township is a private landfill comprising approximately 400 acres of area. The landfill accepts waste from municipalities as well as the general public. This landfill is ideally located to serve the northern part of the County, especially Brick, Dover and Lakewood, which comprise 50% of the County's population. Transportation accessibility is very good to the landfill via State Route 70.

The second private landfill is Southern Ocean Landfill, Inc., in Ocean Township. The 283 acre landfill is ideally situated to serve the southern half of the County. In fact, currently there are nine municipalities hauling solid waste to this site. Transportation access is good via the Garden State Parkway to local roads. Both landfills have adequate land available to insure many years of service to Ocean County.

Ocean County would realize benefits by consolidating the existing landfill system into two county-operated disposal sites. It is only inevitable that many of the smaller municipal landfills located throughout the County will be forced to close when required to meet stringent new Department of Environmental Protection regulations. This would compound the existing disposal problem by forcing many municipalities to rely on fewer landfills for disposal. County operation of the two abovementioned sanitary landfills insures a long-term regional disposal plan for the solid

waste generated within its borders.

Another advantage realized is that the disposal facilities can be used almost immediately by those municipalities with the greatest need. As a county facility, the Ocean County Landfill Corporation site could serve its existing Ocean County customers, plus the shore communities on Island Beach and the populated areas of Dover Township, Bricktown, etc. Also, as a county facility, the Southern Ocean Landfill, Inc., site could serve the shore communities on Long Beach Island as well as its existing customers. Then, gradually, as more municipalities find their present disposal sites inadequate or unlawful, they could phase into the county-operated system. Other municipalities may have contractual agreements with private contractors or have existing sanitary landfills with some life expectancy and will phase into a county-wide system in the future.

The construction of solid waste transfer stations on or near Long Beach Island and Island Beach could provide relief to the serious solid waste disposal problems faced by the island municipalities. Some of the immediate benefits achieved by transfer stations include stabilization of haulage costs and distances, reduction of traffic hauling to and from the disposal site, and more efficient solid waste collection since collection trucks return to the routes quicker. Only 2 to 5 acres are required for an environmentally acceptable transfer station. Additional information concerning transfer stations is presented later in this report.

Figure 4 illustrates a county-wide solid waste disposal system utilizing two sanitary landfills and two transfer stations. The proposed Ocean County disposal strategy is a plan that will consolidate the wastes of many municipalities ultimately to two sanitary landfills that are environmentally secure.

Figure 5 illustrates the proposed overall solid waste disposal and resource recovery planning strategy proposed for Ocean County. The following steps describe the proposed strategy:

1. The existing solid waste disposal system consists of the 15 municipal landfills, 2 major private landfills in-county, and 3 out-of-county landfills. Figure 3 illustrates the location of these landfills. Total existing county tonnage of solid waste is about 1500 tons/day.
2. County purchases or leases existing landfilling operations of Ocean County Landfill Corporation, and Southern Landfill, Inc., as facilities for county-wide solid waste disposal plan. This could occur in 1977.
3. County initiates activities to monitor environmental factors, including surface and groundwater monitoring program. Also, Ocean County initiates construction activities to develop environmentally secure sanitary landfills, including possibly bottom and top liners for landfills, leachate collection and treatment, operation safeguards, gas venting, etc. This would nominally occur in the period 1978 to 1979. At this stage, a number of Ocean County municipalities

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

DISPOSAL STRATEGY USING TWO SANITARY LANDFILLS AND TWO TRANSFER STATIONS

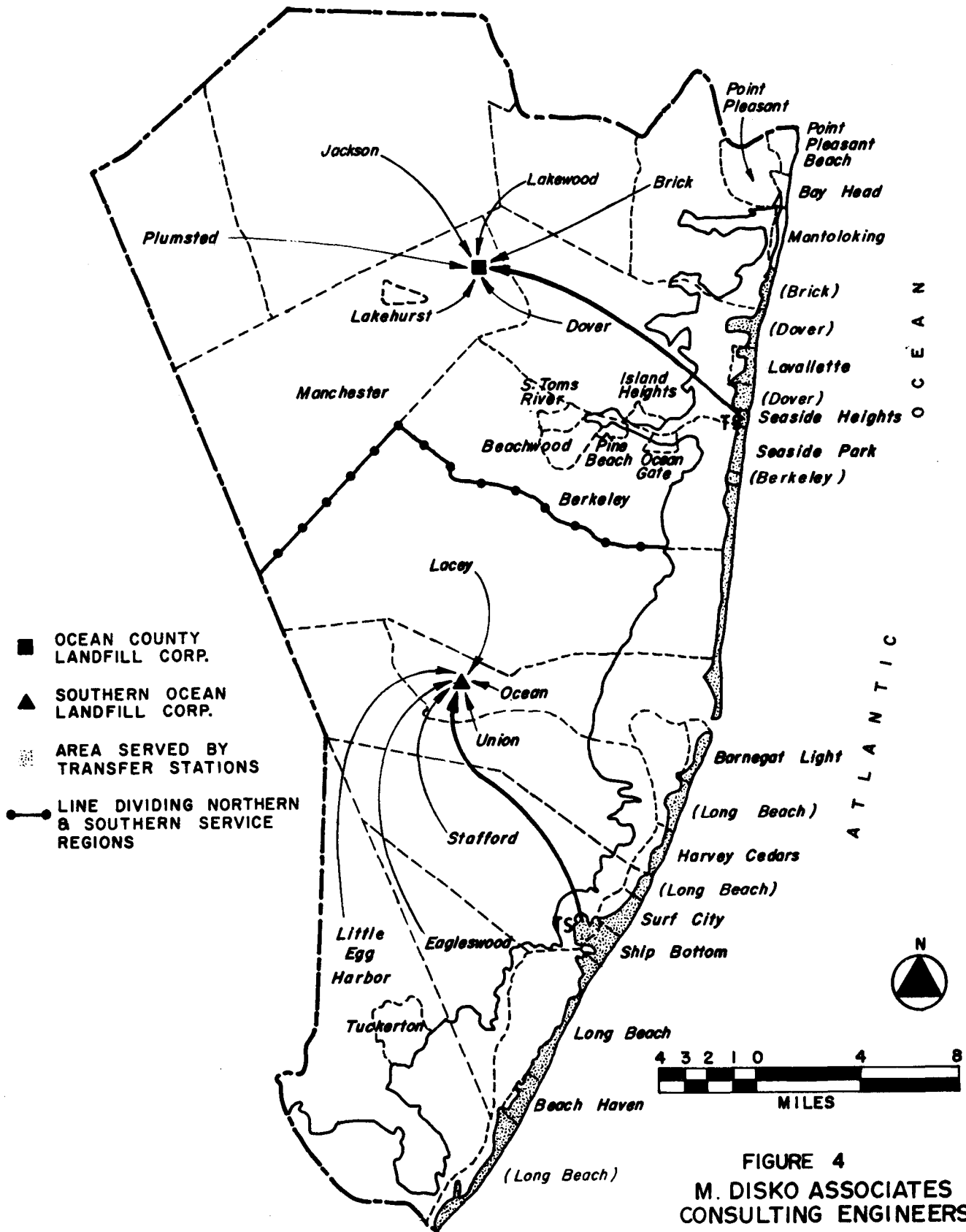


FIGURE 4
M. DISKO ASSOCIATES
CONSULTING ENGINEERS

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

SOLID WASTE DISPOSAL AND RESOURCE RECOVERY PLANNING STRATEGY

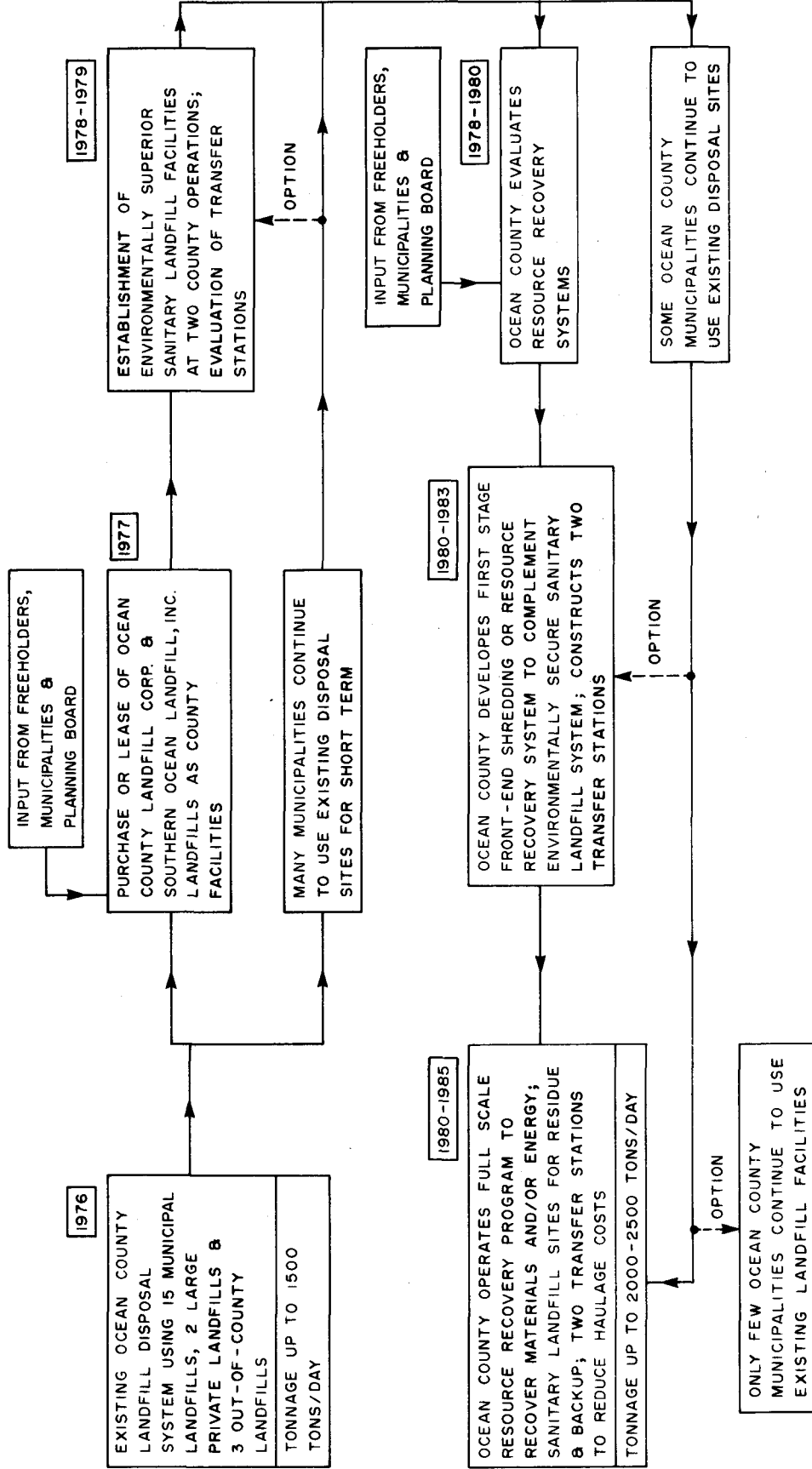


FIGURE 5 M. DISKO ASSOCIATES CONSULTING ENGINEERS

would use the regional facilities, with the rest using their own disposal facilities. In addition, the feasibility of establishing two transfer stations would be reviewed.

4. During the period of 1978 through 1980, Ocean County would evaluate various resource recovery systems for possible utilization.
5. The development of the first stages of resource recovery or the construction of a front-end shredding system with ferrous recovery would be considered to compliment the environmentally secure sanitary landfill system. If feasible, the two transfer stations would be constructed to complete the basic system. The nominal period for these activities would be 1980 to 1983. Additional municipalities would phase into use of the county-wide system during this stage of the plan.
6. During the nominal period of 1980 to 1985, the County would operate a full scale resource recovery program to recover materials and/or energy. At this stage the sanitary landfills would be utilized for residues from the resource recovery processes, as emergency back-up facilities, and for disposal of items such as road sweepings, leaf and brush, etc. By this stage of the plan, the majority of the County's municipalities would have phased into the regional system.

The proposed Ocean County solid waste disposal system is environmentally sound because the wastes are disposed in two sanitary landfills that are well buffered from neighboring residential areas and will be upgraded to high environmental standards. It is economical because it consolidates all of the County's waste into two centrally located landfills that operate with economy of scale. It addresses the needs of highly developed coastal communities by stabilizing their haulage distances and costs. It allows for the gradual phase-in of all of the municipalities to the county system, and it allows for the gradual phase-in of resource recovery.

FUTURE PHASING-IN OF RESOURCE RECOVERY

The disposal plan, as outlined above, is a dynamic plan that is flexible enough to adapt to future technologies. By operating the two landfills initially, the County provides for the needs of some of its municipalities for immediate solid waste disposal. As more and more municipalities opt to use the County's facilities, and as the tonnage levels increase, the County can consider the first phases of resource recovery. The separation of reclaimable materials from the refuse has several benefits, notably the reduction in refuse requiring landfilling and the profits realized through the sale of the reclaimed products.

The first phase of resource recovery to be constructed could be shredding of all refuse and magnetic separation of ferrous metal. The advantages realized through shredding the waste before landfilling include: higher densities, less voids, a more homogeneous

mixture, less odor, longer landfill life, etc. After shredding, magnetic separators would recover the ferrous fraction for immediate re-sale to de-tinners or steel salvage dealers.

As the refuse quantities increase, additional recovery phases could be added to recover aluminum, glass, a "light-fraction" fuel, and non-ferrous metals. These materials could be sold to various secondary materials markets in the region. It should be remembered that while construction of resource recovery facilities was underway, the existing landfills would still be serving the disposal needs of the County in an economical way.

Phasing-in the resource recovery facilities would be based upon future capital availability, public encouragement, levels of operation, etc. Figure 5 illustrates the schematic concept of the proposed plan.

Major new resource recovery and solid waste disposal techniques are under development in the Nation. The concept of burning and wasting valuable resources and energy is being phased out as more and more resource recovery facilities which reclaim aluminum, ferrous metal, paper and energy, are planned and constructed. Resource recovery is considered by experts to be the most promising future method of solid waste disposal.

Figure 6 illustrates a typical resource recovery facility from a schematic point-of-view. Obviously, the schematic system shown would not necessarily be the system chosen for Ocean County, but it serves to point out the features of a typical resource recovery system that could be constructed in the future.

UTILIZATION OF SOLID WASTE TRANSFER SYSTEMS IN THE REGIONAL SYSTEM

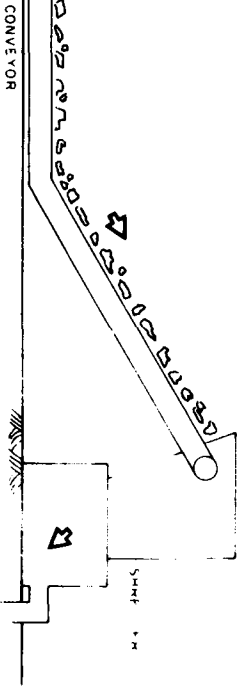
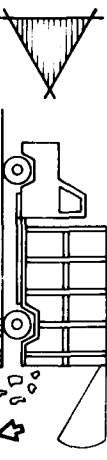
As described in this Chapter, the utilization of two transfer stations, one located near Long Beach Island and one located near Island Beach, is recommended. The specific site locations would have to be determined in the future.

A complete discussion of the utilization of transfer stations to reduce haulage costs is presented in Chapter IX of Volume I. Essentially, a solid waste transfer station is a building in which packer trucks transfer their wastes to larger transfer trailers. The packer collection trucks enter the building, dump their load of wastes, and return immediately to their collection routes. Then the waste is hydraulically packed into large tractor-trailer trucks that then make the trip to the disposal site.

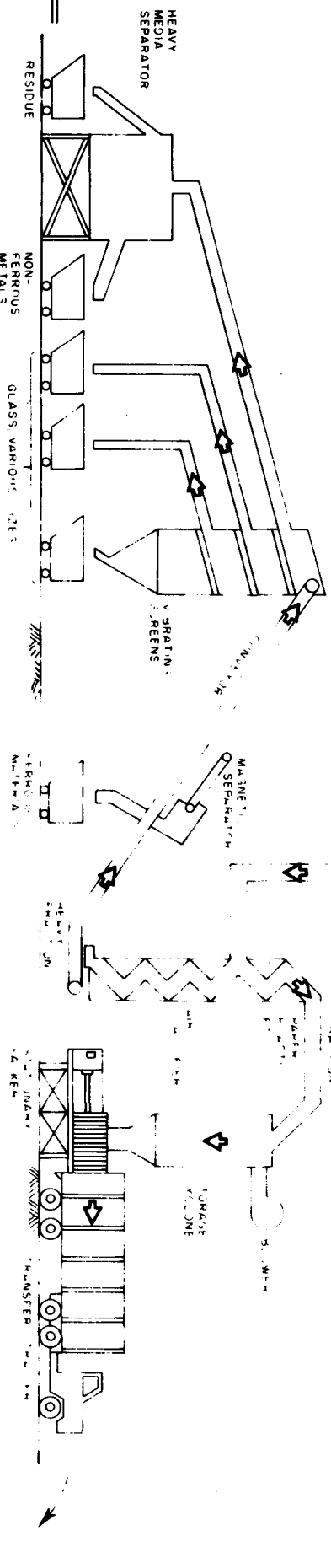
There are many advantages to a transfer station. Some of these, as defined in Volume I of the Ocean County Solid Waste Disposal and Resource Recovery Study, include the following:

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

MUNICIPAL SOLID WASTE
UNLOADING AREA



TYPICAL
**RESOURCE RECOVERY
SYSTEM**
FOR MUNICIPAL SOLID WASTE



MATERIALS RECOVERY
HEAVY FRACTION IS PROCESSED TO RECOVER & SELL MATERIALS FERROUS METALS & TIN ALUMINUM LEAD, ZINC, COPPER GLASS NON-USEABLE RESIDUE IS LANDFILLED

ENERGY RECOVERY
PAPER, PLASTICS, & WOOD HAULED TO INDUSTRIAL OR GOVERNMENTAL USERS AS A FUEL SOURCE OR UTILITY FOR USE AS SUPPLEMENTAL FUEL OR FOR STEAM PRODUCTION

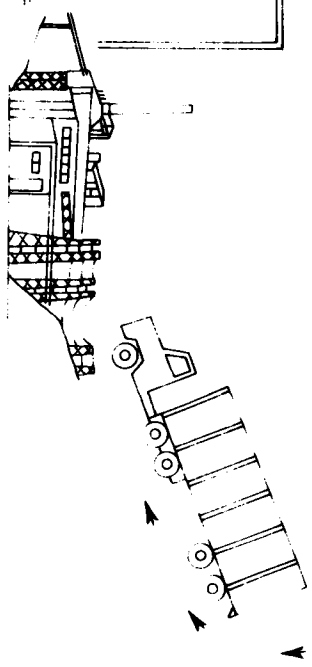


FIGURE 6

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CONSULTING ENGINEERS

. Haulage costs to the disposal site are reduced because the number of smaller trucks hauling to the disposal area is reduced. This, in turn, reduces truck wear and tear, and maintenance costs. In addition, it allows the packer trucks to quickly return to the collection routes.

. Labor costs are reduced because the driver of the transfer trailer is the only person that makes the time-consuming trip to the disposal site. After the collection truck, with its one, two, or three-man crew, finishes loading, it drives to the centrally located, close-in transfer station, empties its waste load, and immediately returns to the collection route.

. The transfer station can be housed in an attractive building that allows the collection trucks to dump where odor, dust, and noise can be controlled. This allows a transfer station to be a good environmental neighbor that can be easily located on small acreage in an industrially or commercially zoned area.

. The relatively small size enables the transfer station to be built on small land parcels. Stations can be built on as little as 2 acres, but 5 acres is preferred to include buffer areas.

- . The number of collection trucks passing through other municipalities on route to the disposal site is reduced. Instead, fewer, less conspicuous transfer trailers pass along the major highways.
- . Clean-up services are improved and costs reduced. The central facility can also be used by residents to dispose of bulky wastes, trash, etc.
- . A transfer station offers a municipality flexibility in the event of being closed out of a particular landfill or disposal site. The municipality or region can haul to another site without major re-routing difficulty.

A transfer station can offer savings in haulage costs. A transfer station will not lower the unit disposal costs of landfilling, but the time and costs involved for haulage are substantially reduced.

Generally a transfer facility is justified if the round trip haul distance to the disposal site exceeds 20 miles. However, each area must be studied individually to determine the break-even distance beyond which a transfer station saves money. Although distance to the disposal site is important, often the round-trip travel time to the site is also an important factor. One of the most expensive aspects of refuse collection, labor costs, are keyed to time, not distance.

There are many factors which will determine the capital and operating costs for a transfer station. Some of these include: 1) type of building construction, 2) type of transfer system and related equipment, 3) location of facility, 4) throughput tonnage, etc. The estimated cost of a transfer station facility, based on M. Disko Associates' design experience, is shown on the following table:

APPROXIMATE CAPITAL COST OF BUILDING
SITE WORK EQUIPMENT AND VEHICLES FOR
TRANSFER STATION IN THE NEW JERSEY AREA

<u>NOMINAL 8 HR. CAPACITY</u>	<u>ESTIMATED CAPITAL COST</u>
75 tons	\$200,000 to \$350,000
150 tons	\$400,000 to \$550,000
250 tons	\$500,000 to \$700,000

Typically, overall cost of equipment, site improvements, and structures for a solid waste transfer station in Ocean County would range from about \$2,000 to \$5,000 per ton of 8 hour capacity, excluding land costs. The land required for a transfer station in the Ocean County area should be at least 2 acres, but usually about 5 acres are necessary to allow for a suitable buffer.

The overall cost of amortization, operation, labor and maintenance for a transfer station in Ocean County will be in the

range of \$1.50 to \$3 per ton, depending on the round-trip haulage, but excluding any disposal charges. This is substantially less than the cost incurred in using a smaller packer truck to haul wastes to the disposal facility.

INFORMATION CONCERNING THE LANDFILLS RECOMMENDED FOR PURCHASE

The following information is reproduced herein from the Volume I study in order to provide a basic description of the two landfills. All information is based on 1975 data.

The Ocean County Landfill Corporation operates a landfill on Route 70, 1/4 mile east of County Route 571, in Manchester Township. The landfill is privately owned and operated under Public Utilities Commission jurisdiction. It accepts solid and liquid wastes from the general public as well as municipalities. The landfill currently uses the following fee schedule:

<u>Material</u>	<u>Rate</u>
Residential refuse	\$4.50 per ton
Single individual customer	\$1.00 per 30 gal. container
Commercial refuse	\$4.50 per ton
Bulky refuse	\$4.50 per ton
Oversized refuse	\$6.00 per ton
Demolition concrete	\$3.00 per .
Domolition wood	\$6.00 per ton
Septic waste	\$0.06 per gallon

Wastes accepted at the disposal site include household garbage and trash, commercial, industrial, institutional, bulky clean-up

items, septic wastes, sewage sludge, yard debris, etc. According to files of the Department of Environmental Protection, the landfill is 400 acres in size.

The soil at the disposal site is gravel, sand, and clay to a depth of 75 feet. The groundcover is top soil and road gravel. The facility uses the trench and area methods of landfilling. Cover material is available on site from excavation at a sand mine. The landfill reportedly uses 250 cy of cover daily.

According to municipal officials, the following municipalities have solid waste hauled to the Ocean County Landfill Corporation disposal site: parts of Manchester Township, Lavallette Borough, Seaside Heights Borough, as well as private contractors servicing commercial and industrial units throughout northern Ocean County.

Equipment utilized on the Ocean County Landfill Corporation landfill include a Bucyrus Erie 61-B 3-1/2 cy drag line, a Caterpillar D-8 bulldozer, a Caterpillar D-6 bulldozer, a Caterpillar 980 front end loader, a Caterpillar 12F motor grader and three Caterpillar 35 ton rear dump trucks.

Southern Ocean Landfill, Inc., site is located on Route 532 in Ocean Township. The 283-acre facility reportedly accepts all wastes, including household, commercial, industrial, institutional, bulky items, tires, yard debris, sewage sludge, and septic tank wastes. The landfill is open to the public.

The soil at the site is predominantly sand with some layers of clay and sand-clay. The groundcover is wooded. The landfill utilizes the area and trench methods of landfilling. There is reportedly sufficient cover material on site to meet the needs of the landfill. The landfill uses a Caterpillar 977-H front end loader, and a Caterpillar D-7 bulldozer.

According to landfill records, trucks from the firm of Calderia Brothers make about 25 trips to the disposal area per week. In addition, solid wastes from the following municipalities enter Southern Ocean Landfill, Inc.: Beach Haven, Barnegat Light, Harvey Cedars, Island Heights, Ocean Township, Ocean Gate, Pine Beach, Ship Bottom, and Union Township.

According to Public Utilities Commission tariffs, Southern Ocean Landfill Inc., uses the following fee schedule:

<u>Material</u>	<u>Rate</u>
Bulky refuse	\$2.50 per cy or \$6.00 per ton, whichever is greater
Loose and/or compacted	\$1.00 per cy or \$3.00 per ton, whichever is greater
Chemicals	\$0.05 per gallon
Septic Waste	
1000-2000 gallons	\$5.00 per 1000 gallons
2100 or greater	\$8.50 per 1000 gallons

ECONOMIC ASPECTS OF THE PROPOSED SOLID WASTE DISPOSAL STRATEGY

Ocean County could directly purchase the required landfill areas from the Ocean County Landfill Corporation and from Southern

Ocean Landfill, Inc. Alternatively lands could be obtained through a long term lease or through a lease purchase plan. The details of the purchase/lease arrangements would be subject to negotiations with the landfill owners. Preliminary discussions in this regard have been held with the owners and County Staff.

Cost of the land at the two State approved landfills would be in the range of \$3 to \$6 million, depending upon the purchase price per acre and the acreage determined to be necessary. Using a lease or lease purchase plan, large capital expenditures for land could be avoided initially.

The existing fee schedules range from \$3.00 to \$4.50 per ton of municipal solid waste at the two landfills. These rates could be either maintained by the County or equalized on an overall basis. It may be possible to slightly reduce the fee schedules.

Cash flow for operations is initially built-in since both landfills currently have customers. Capital requirements for environmental improvements could be provided by bonds. The proposed solid waste disposal plan allows considerable flexibility in phasing construction and improvements to meet economic conditions.

V. IMPLEMENTATION OF THE PROPOSED
SOLID WASTE DISPOSAL PLAN

IMPLEMENTATION STEPS

Figure 7 illustrates the basic steps required to implement the proposed solid waste disposal plan. A description of the important steps follows:

1. A basic decision required is to determine the administrative structure required to operate the proposed Ocean County Solid Waste Disposal System. A County department could be designated as the operating agency, or another agency such as the Ocean County Sewerage Authority could be designated. As described in the next section of this Chapter, a County department is the recommended administrative structure.
2. The Ocean County solid waste disposal plan, pursuant to the requirements of S. 624, must be formalized in final form together with all necessary information. A discussion of the requirements are presented in this Chapter.
3. Negotiations with the owners of the two landfills must be formally initiated to determine the selling price and conditions. Additional negotiations with the host municipalities, Manchester Township and Ocean Township, must be initiated to determine payments in lieu of taxes. Both municipalities currently have free disposal privileges at

OCEAN COUNTY SOLID WASTE DISPOSAL MANAGEMENT STUDY

SOLID WASTE DISPOSAL SYSTEM DEVELOPMENT INITIAL IMPLEMENTATION STRATEGY

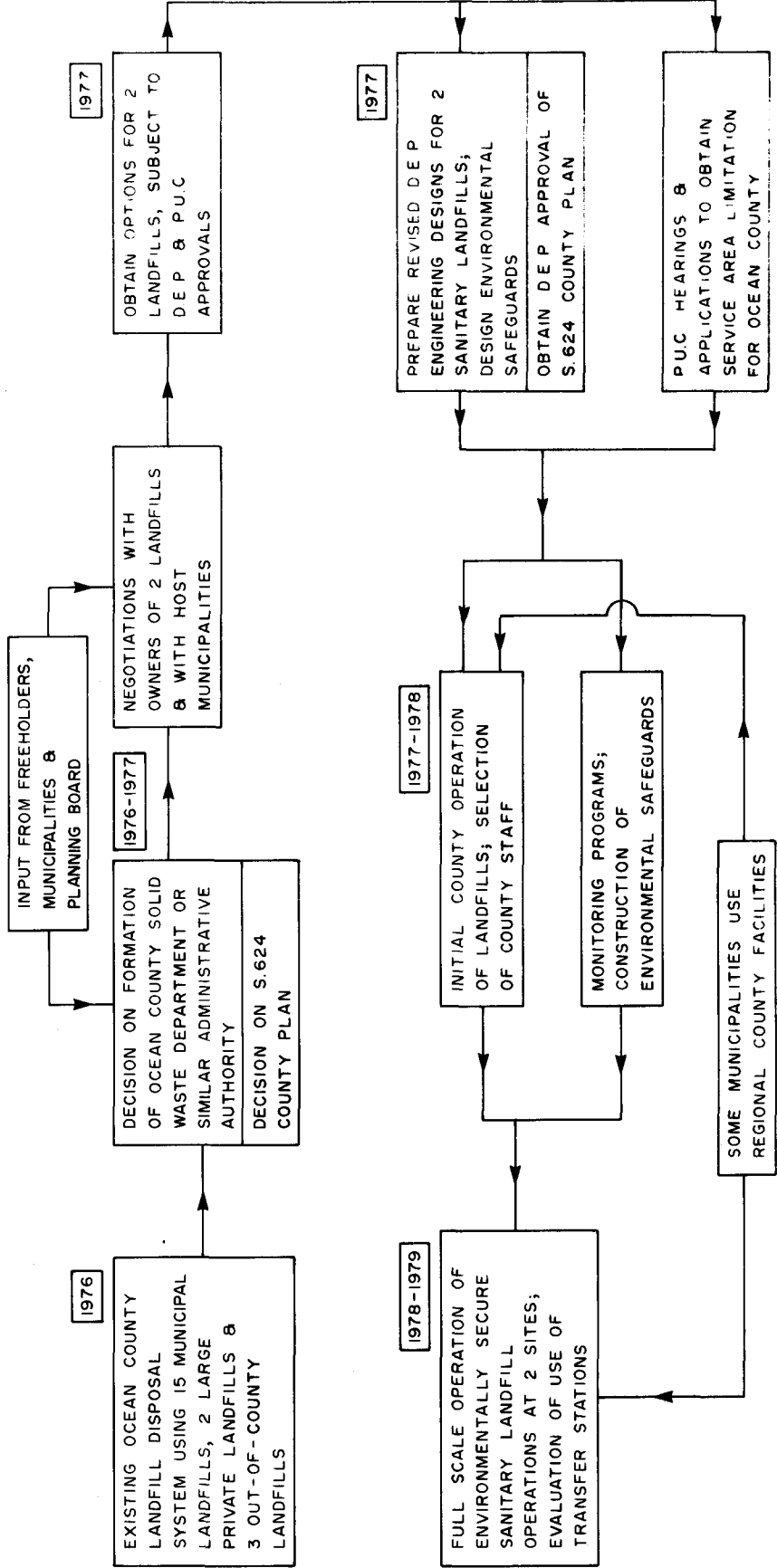


FIGURE 7 M DISKO ASSOCIATES CONSULTING ENGINEERS

their respective landfills. Concessions to the municipalities could include a continuation of their disposal privileges, sand for road projects, etc.

4. Options would be obtained for purchase of each of the two private sanitary landfills, subject to final approval of the transfer of the landfill permits by the State Department of Environmental Protection and the Public Utilities Commission.
5. Revised engineering designs for the two sanitary landfills, including details of well monitoring and environmental safeguards. The purpose of the revised engineering designs would be to upgrade environmental factors to produce a secure sanitary landfill. Environmental improvements could include leachate collection and treatment, capping previously landfilled areas to reduce leachate production, constructing bottom liners, installing additional groundwater monitoring wells and gas vents, etc. Formal approval of the modified landfill designs and the S. 624 County Plan would be obtained.
6. Concurrently with step number 5 above, a formal transfer application and associated hearings would be initiated to modify the P.U.C. tariff and service area. The intent is to curtail the possibility of solid waste from out-of-county from coming into the county system. Existing contracts would be honored until their expiration, but no new out-of-

county customers would be desired. An application for a franchise or for stipulation not to be required to take new out-of-county customers will be filed with the P.U.C.

7. Following approvals by the D.E.P. and P.U.C., initial operation of the county facilities could be started. County staff for the facilities would be selected and trained. Initial construction of the monitoring program and development of environmental safeguards would begin. At this point in time many of the County's municipalities would begin to phase-in to the County's operation.
8. By 1978 or 1979, full scale operation of the County sanitary landfill system would be underway. A trained staff of operators with proper equipment would be available.

Implementation of the proposed county-wide solid waste disposal system can occur over a two to three year period. The proposed program is comprehensive in scope and allows for considerable flexibility.

REQUIREMENTS FOR OCEAN COUNTY SOLID WASTE MANAGEMENT PLAN PURSUANT TO S 624

Pursuant to Senate 624, each county in New Jersey must complete a county solid waste management plan. An advisory council composed of mayors or designees, persons in the solid waste business, and environmentalists must be formed to provide guidance in the development of the plan.

As defined in S 624 the following items must be contained in the county solid waste management plan.

Required Item
Pursuant to S 624

Existing Ocean County Work

- | | |
|---|--|
| 1. Inventory of sources, composition, quantities of solid waste in district in year new report is prepared | Completed in Volume I. |
| 2. Projections of amounts and composition of solid wastes for next 10 years | Completed in Volume I. |
| 3. An inventory and appraisal including life expectancy, location, etc., of each solid waste facility in district | Completed in Volume I. |
| 4. Analysis of existing solid waste collection systems and transportation routes within the district | Information in Volume I. |
| 5. Statement of solid waste strategy to be utilized in the district | Must develop a policy strategy for the County. |
| 6. A site plan locating all existing solid waste facilities and additional sites available to handle solid wastes from the district | Existing sites can be located. Additional listing of new sites is of course a difficult policy matter. |
| 7. A survey of collection districts with transportation costs to existing or available sites | Some existing data available. Costs must be developed based upon a county plan strategy. |
| 8. Develop procedures for coordinating activities related to collection and disposal of solid waste within the district | Must develop procedures in connection with Advisory Council and Freeholders. |

- | | | |
|-----|--|--|
| 9. | Methods of financing solid waste management in the district | Considerable work concerning financing is described in Volume I. Specific policy must be determined. |
| 10. | Development and formulation of map and plan; hearings; submission to Commissioner of DEP and PUC | After development of plan, map, and reports, hearings must be held. Submission to State agencies. |

As the above listing indicates much of the specific information required has been inventoried in Volume I. Acceptance of the proposed Ocean County solid waste disposal plan presented in this report would allow rapid completion of a formal plan to the New Jersey Department of Environmental Protection.

THE COUNTY DEPARTMENT AS THE MOST PRACTICAL ADMINISTRATIVE STRUCTURE

In order for the County to operate a disposal system, an adequate administrative system with requisite financial, jurisdictional, legal, and operational capability would be required. Some of the requirements of the administrative structure include the following:

- . The administrative structure must have sufficient financial capabilities.
- . It must service a population base sufficient to reduce the unit costs of solid waste disposal and to plan, develop, and operate on a county-wide basis.
- . It must be able to acquire property.
- . It should have control over the sources, types, and quantities of solid wastes that are discharged into the processing and disposal system.

- . It should have the necessary personnel and equipment to perform its duties.

Until 1970, the local municipality had primary responsibility for solid waste collection and disposal in New Jersey. Recently, the trend of legislation has been to place responsibility for solid waste management at the county level of government. There are six administrative structures available for regional solid waste management in Ocean County including the following:

- . One or more municipalities may create an Incinerator Authority
- . One or more municipalities may create a Solid Waste Management Authority
- . Joint Meeting between two or more municipalities
- . County department or agency
- . County Utilities Authority established by Freeholders
- . County Improvement Authority established by Freeholders

Of all of the above, the County Department appears to be the strongest administrative system for solid waste disposal management based upon the following considerations:

1. Senate Bill 624, which was signed into law, places direct responsibility for solid waste planning on the county level on the Board of Chosen Freeholders. Use of any other type of administrative structure has built-in potential conflicts.
2. Senate Bill 624 requires the Board of Chosen Freeholders to review the county solid waste plan every two years.

3. Based upon experience in Bergen County and Monmouth County, the County Department has more flexibility to provide trucks, road equipment, temporary manpower, etc., than any other administrative structure, for a solid waste disposal operation.
4. The use of general tax revenues by a County Department is a strong lever for limitation of a solid waste disposal system to a county area only by the P.U.C.
5. The administrative structure utilized for a county-wide system has vast power to deal with municipalities concerning solid waste disposal. This power should be vested with the Freeholders as the elected officials.
6. The ability of a County Department to attract workers appears to be better than any other form of administrative structure. This is because of opportunity for transfer, pension rights, prestige of County, etc.
7. Debt service is higher for revenue bonds used by all other administrative structures, except for County Department which can use general obligation bonds.
8. The County has vast resources in technical personnel in the Engineering Department, Planning Department, Health Department, Road Department, Treasurers Office, etc., all of which can be important to daily operations of a solid waste facility, based on experience in Bergen and Monmouth Counties.

Based upon the above factors, a County Department is recommended as the operating agency for a county-wide solid waste disposal system in Ocean County.

COMPARISON OF PROPOSED PLAN TO CRITERIA FOR SOLID WASTE DISPOSAL PLANNING

In Chapter III of this report, certain key criteria for solid waste disposal planning in Ocean County were discussed. The proposed plan outlined herein meets those criteria as follows:

1. Utilization of existing sanitary landfill sites will result in less public opposition than the selection of new sites. The important concept is that county operation of an existing landfill will result in an upgrading of the facility from an environmental point-of-view and control of out-of-county waste dumping.
2. The proposed two landfill disposal sites have the capacity and area to handle the solid waste quantities generated in the County. Resource recovery could reduce land requirements in the future.
3. The proposed county-wide solid waste disposal plan allows the gradual phase-in of municipalities as they join the Ocean County system when their contracts expire or they close their landfills. Municipalities with immediate needs can use the disposal facilities right away.

4. The recommended use of a County Department as the operating agency for the disposal system appears to be the most responsive and practical form of management, under direct supervision of County government.

5. Use of proven sanitary landfill disposal of solid wastes is the lowest cost method in use today. Sanitary landfilling, with appropriate environmental controls, offers great flexibility to accommodate the County's needs. Resource recovery can be phased-in in the future as required. Initial capital costs for the two landfills could be reduced to a minimum by leasing the lands involved. Any capital improvements at the landfills could be spread out over a period of years. Costs for transfer stations would generally be in the ballpark of 1/2 million dollars for each facility.

6. Environmental controls would be instituted at the two landfills. If the County were to take over and operate two existing landfills, it should submit new landfill designs to the New Jersey Department of Environmental Protection. These engineering designs would outline the measures to be taken to protect the ground and surface waters and other phases of the landfill's operation. The application would bring all phases of the existing landfill's operation into conformity with the State regulations, and preserve and protect all environmental factors to the highest standard.

The proposed plan also gives the County more control over potential importation of solid waste from outside the County. This can be accomplished through service area restrictions obtained from the P.U.C. The remaining municipal landfills in the County are generally not conducive to large scale importation of solid waste from outside the County.