

88

**Ocean County Recycling Plan
Modifications**



**Prepared by: Ocean County Planning Board
Court House Annex
Toms River, NJ 08754**

Ocean County Recycling Plan

Modifications

**Prepared by: Ocean County Planning Board
Court House Annex
Toms River, NJ 08754**

OCEAN COUNTY
RECYCLING PLAN

An Amendment to the
Ocean County District
Solid Waste Management Plan

Revision Dates:
August 24, 1987
August 31, 1987
October 20, 1987
June 15, 1988

Ocean County Planning Board
119 Hooper Avenue
Toms River, New Jersey
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June 7, 1988

To: Ocean County Mayors and Municipal Clerks

Enclosed for your review and comment is a draft copy of an Amendment to the Ocean County Recycling Plan. State law requires the Municipal Clerks to keep the proposed Amendment on file and to make it available for public review.

The proposed modifications to the Ocean County Recycling Plan are required by the New Jersey Department of Environmental Protection as part of their Certification of the Plan. The County is required to address these modifications and to proceed with the implementation of the Plan. Once adopted, this Amendment will become part of the Ocean County District Solid Waste Management Plan.

The draft Amendment to the Ocean County Recycling Plan proposes the following revisions:

1) The County has submitted to the NJDEP, Division of Solid Waste Management, a report entitled, Ocean County Solid Waste Generation, Composition and Recycling Potential. The report demonstrates that the percentage of the designated recyclables in the County waste stream are sufficient to reach the 15% and 25% recycling goal established by the State. The 15% and 25% recycling goals are applied to the total municipal waste stream in Ocean County including the baseload and seasonal waste volumes. The Amendment incorporates the results of the study.

2) The Amendment provides a status report and implementation schedule for the two proposed regional recycling centers and the interim recycling system.

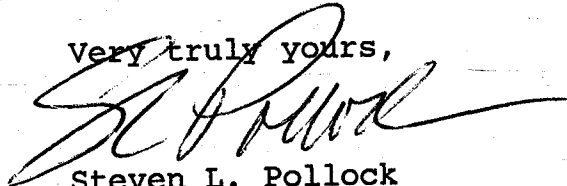
3) The Amendment provides for the identification of the leaf composting facilities to be used by each municipality in Ocean County for the recycling of leaves, which is required beginning September 1, 1988.

4) The Amendment includes a revised procedure for modifying the District Recycling Plan which will include a legal notice requirement and provide a public comment period for any future Recycling Plan Amendments.

The Ocean County Board of Chosen Freeholders has scheduled a public hearing for Wednesday, July 6, 1988 which will be held in Room 119 of the Ocean County Administration Building, 101 Hooper Avenue, Toms River, New Jersey. The public hearing will be part of the Agenda for the regular meeting of the Board of Chosen Freeholders which begins at 3:00 PM.

Should you have any questions or comments, please feel free to contact me at (201)929-2055 or John Haas, County Recycling Coordinator at (201)929-2054.

Very truly yours,



Steven L. Pollock
Planning Director

SLP:sh

Enclosure

cc: Board of Chosen Freeholders
Clerk of the Board
County Administrator
County Counsel
Municipal Recycling Coordinators
NJ Office of Recycling

ACKNOWLEDGEMENTS

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INTRODUCTION

The Ocean County Board of Chosen Freeholders adopted the Ocean County Recycling Plan as an Amendment to the Ocean County District Solid Waste Management Plan on October 21, 1987. The Plan was prepared to conform with the New Jersey Mandatory Source Separation and Recycling Act of 1987.

On March 22, 1988 the Commissioner of the New Jersey Department of Environmental Protection issued a Certification that approved the Ocean County Recycling Plan, but also required certain minor modifications. The purpose of this Plan Amendment is to address the issues raised in the NJDEP certification and to incorporate required changes in Sections 4.0, 5.0, 6.0 and 8.0 of the Recycling Plan.

Summary of DEP Requirements

1. The State requested more current solid waste composition and generation information including seasonal waste generation and composition data for each municipality. The State required that the 15 percent and 25 percent recycling goals be applied to the most recent information on municipal solid waste composition and generation and that the volumes reflect the annual solid waste generation rates for each municipality. (Section 6.0)

2. The State required clarification of the mandatory recycling requirements for commercial and institutional establishments.

3. The State required clarification of the model recycling ordinance included as an appendix to the Recycling Plan and required municipalities to include an enforcement provision with minimum monetary penalties in their ordinance.

4. The State required the County to designate the leaf composting facility each municipality will use and document that sufficient permitted capacity exists for all the leaves generated in Ocean County. (Section 5.0)

5. The State required additional information on the status of the County recycling centers and that the facilities be operational by October 1988. (Section 4.0)

6. The State required changes in the procedures for amending the Ocean County Recycling Plan to provide for legal notice and public comment. (Section 8.0)

Solid Waste Generation, Composition and Recycling Potential Report

The successful development and implementation of a countywide mandatory recycling program with two regional county sponsored centers requires a substantial amount of planning to ensure the facilities are properly sized and designed. In addition, the Mandatory Recycling and Source Separation Act requires the County to apply the State's 15 percent and 25 percent recycling targets to the total annual solid waste generation rate for each municipality in Ocean County. This means that municipalities in tourism areas are required to recycle 15 percent and 25 percent of the waste generated by tourists. When the Ocean County Recycling Plan was being prepared in the summer of 1987 the solid waste generation and composition data was based on 1984 information which at that time was the best available data. The planning staff was aware the State would require more current information. In the summer of 1987 the County contracted with Gershman, Brickner and Bratton and Elson T. Killam Associates to conduct a Solid Waste Generation, Composition and Recycling Potential Report. The consultants collected data at the two landfills in Ocean County during August, 1987 and January, 1988. The data was collected following guidelines established by the NJDEP.

One of the important findings of the study was verification that a sufficient volume of the four designated recyclable materials (28.6percent) is present in the municipal waste stream in Ocean County in order to achieve the Act's 15 percent and 25 percent recycling targets. This Amendment incorporates the results of the report. The entire Solid Waste Generation, Composition and Recycling Potential Report, April 1988 is contained in the Appendix.

Revised Recovery Targets for Recyclables (Section 6.0)

The County has revised the assigned recovery targets for recyclable materials for each municipality in Ocean County based on the Ocean County Solid Waste Generation, Composition and Recycling Potential Report of April 1988. The County plans to achieve the municipal recovery targets consistent with the Act of 15 percent in 1989 and 25 percent in 1990. The following table contains an estimate of the quantities of the designated recyclables for each municipality.

WASTE TYPE 10 QUANTITIES OF DESIGNATED RECYCLABLES

Municipality	Proposed Recycling Center (1)	Estimated 1987 Waste Type 10 Tons Generated	Estimated Available Newspaper Tons	Estimated Available Aluminum Tons	Estimated Available Glass Tons	Estimated Available Ferrous Tons	Estimated Available Total Recyclable Tons	15% Recycling Goal	25% Recycling Goal
		(2)	(13.1%)	(1.3%)	(10.1%)	(4.1%)	100% Capture		
Barnegat Twp.	South	8,081	1,059	105	816	331	2,311	1,212	2,020
Barnegat Light Boro	South	2,213	290	29	224	91	633	332	553
Bay Head Boro	North	2,132	279	28	215	87	610	320	533
Beach Haven Boro	South	4,321	564	56	436	177	1,236	648	1,080
Beachwood Boro	North	6,989	914	91	706	287	1,999	1,048	1,747
Berkeley Twp.	Both	27,443	3,598	357	2,774	1,126	7,854	4,119	6,866
Brick Twp.	North	44,831	6,135	609	4,730	1,920	13,394	7,025	11,708
Dover Twp.	North	102,397	13,414	1,331	10,342	4,198	29,285	15,360	25,599
Eagleswood Twp.	South	1,692	222	22	171	69	484	254	423
Harvey Cedars Boro	South	1,813	237	24	183	74	518	272	453
Island Heights Boro	North	1,554	204	20	157	64	445	233	389
Jackson Twp.	North	17,645	2,312	229	1,782	723	5,046	2,647	4,411
Lacey Twp.	South	18,208	2,385	237	1,839	747	5,208	2,731	4,552
Lakeland Boro	North	2,888	378	38	292	118	826	433	722
Lakewood Boro	North	26,799	3,511	348	2,707	1,099	7,664	4,020	6,700
Lavalletta Boro	North	3,444	454	45	350	142	991	520	866
Little Egg Harbor Twp.	South	10,695	1,401	139	1,080	438	3,059	1,604	2,674
Long Beach Twp.	South	14,683	1,923	191	1,443	602	4,199	2,202	3,671
Manchester Twp.	North	15,581	2,041	203	1,574	639	4,456	2,337	3,895
Mantoloking Boro.	North	688	90	9	69	28	197	103	172
Ocean Twp.	South	5,364	729	72	542	228	1,591	835	1,391
Ocean Gate Boro	North	1,640	217	22	168	68	475	249	415
Pine Beach Boro	North	2,381	312	31	240	98	681	357	595
Plumsted Twp.	North	2,915	382	38	294	120	834	437	729
Point Pleasant Boro	North	17,994	2,357	234	1,818	738	5,147	2,699	4,499
Pt. Pleasant Bch. Boro	North	5,731	751	74	579	235	1,639	840	1,433
Seaside Heights Boro	North	5,324	698	69	538	218	1,523	799	1,332
Seaside Park Boro	North	2,910	381	38	294	119	832	437	728
Ship Bottom Boro	South	2,994	392	39	302	123	854	449	749
South Toms River Boro	North	4,480	587	58	452	184	1,281	672	1,120
Stafford Twp.	South	19,348	2,537	252	1,954	794	5,539	2,905	4,842
Surf City Boro	South	3,655	479	48	369	150	1,045	548	914
Tuckerton Boro	South	4,949	648	64	500	203	1,415	742	1,237
TOTALS		396,044	51,885	5,150	40,002	16,238	113,273	59,410	99,017

Municipal Ordinance Requirements

The Certification of the Ocean County Recycling Plan required that municipalities include an enforcement mechanism in their recycling ordinances and a provision for minimum monetary penalties for violations. The municipal recycling ordinance must also require the mandatory recycling of designated materials from commercial, institutional and multiple family dwellings. The model recycling ordinance contained in the Ocean County Recycling Plan used the term "persons" which was defined to mean "every owner, lessee or occupant of a residence, commercial or institutional establishment within the boundaries of the municipality." Those municipal ordinances which use the term "persons" as defined above satisfy the State requirement.

Section 9A of the model recycling ordinance is changed to read as follows: "Any person, firm or corporation violating the provision of Section 7 of this Ordinance shall be subject to a fine of not less than One hundred Dollars (\$100.00) nor more than Five Hundred Dollars (\$500.00) for each offense." This change corrects a typographical error.

Section 9B of the model recycling ordinance is changed to read as follows: "Any person, firm or corporation violating any provision of the Ordinance other than Section 7, or any regulations adopted hereunder shall be subject to a fine of not less than Twenty-five Dollars (\$25.00) nor more than Five Hundred Dollars (\$500.00) for each offense." This change corrects a typographical error.

Those municipal ordinance which incorporate the monetary penalties as set forth in Sections 9A and 9B as revised above satisfy the State requirement. Municipalities must, however, include a provision for minimum monetary penalties for violations in their recycling ordinances.

County Recycling Facilities (Section 4.0)

Since the adoption of the Ocean County Recycling Plan in October, 1987 the County has been proceeding with implementation of the Plan. The County will provide for the operation of two regional recycling facilities. The Southern Regional Recycling facility will be located in Stafford Township at the Stafford Industrial Park. The site is currently owned by Ocean County and is approximately 5 acres in size. The County is negotiating with Lakewood Township to acquire their 60 acre recycling center and compost site for use as the Northern Regional Recycling Center. Negotiations should be completed by early summer.

To insure that regional facilities are available prior to October, 1988 the County will establish an interim recycling system in the summer of 1988 at the two regional recycling center sites. The County will place ten 30 cu. yd. roll off containers at the sites and transport designated recyclables, which are delivered by municipalities or private haulers, to existing recycling facilities. The County is finalizing a contract with Monmouth Recycling for them to accept 30 tons per day of comingled designated recyclables. In addition, the County has a contract with Rosetto Recycling Center to accept 100 tons per day of recyclable material. The Rosetto agreement provides that the County will receive \$25.00 per ton. The Agreements provide for handling aluminum cans, glass containers, tin and bi-metal containers, newsprint, corrugated and plastic containers.

The Agreements are for both the four designated materials and for non-mandated materials. By having agreements with two vendors the County is assured of being able to maintain an uninterrupted flow of recycled material to the market place. The County has ordered the ten roll off containers and a truck with a hoist and this equipment will be delivered in June, 1988. The County will be finalizing arrangements for the two regional recycling center sites in the near future. This will enable the County to start up operations in advance of the October deadline required by law.

On April 20, 1988 the Ocean County Board of Chosen Freeholders authorized a Bond Ordinance in the amount of \$8,500,000 for the

two regional recycling centers including land acquisition, facilities, and equipment. A copy of the Bond Ordinance is contained in the Appendix.

The County and its consultants are completing the RFP for the planned recycling processing facility and it will be issued shortly. An implementation schedule for the regional recycling facilities has been developed and follows this section.

Implementation Schedule

October, 1987	Ocean County Recycling Plan - Adopted
January, 1988	Stafford Township approves County proposal to serve as the southern regional recycling center site.
March, 1988	Board of Chosen Freeholders awards a bid for the equipment for the interim recycling system.
May, 1988	County awards a contract with two recycling markets to accept materials from interim recycling system.
June, 1988	County Agreement with Lakewood Township regarding the northern recycling center operation.
June, 1988	Site improvements completed at the two regional recycling centers for operation of the interim recycling system.
July, 1988	County issues RFP for regional recycling processing facility.
August, 1988	Interim recycling system becomes operational.
Fall, 1988	County awards a contract for regional recycling processing facility.
Fall, 1988	Construction commences at regional recycling facilities.
October, 1988	Mandatory Recycling in effect for the 33 municipalities in Ocean County.
Summer, 1989	Construction completed.
Summer, 1989	Operation of in-county recycling processing facilities.

Leaf Composting Implementation (Section 5.0)

In response to the NJDEP Certification, the County has surveyed the permitted leaf composting sites in Ocean County and a service area has been proposed that provides sufficient capacity to accommodate all the municipalities in Ocean County. The County has proposed the regionalization of existing municipal facilities. In January, 1988 the County sent Interlocal Service Agreements to the eight municipalities with leaf composting facilities. Thus far Agreements have been fully executed with Stafford, Beachwood and Dover Township. The County is negotiating to buy the Lakewood Township recycling center and leaf composting site which consists of 60 acres. Agreements are under review in Jackson, Lacey and Manchester Townships, and Brick Township has applied to the NJDEP for a permit for its site. The Stafford, Lakewood, Dover and Beachwood sites provide sufficient capacity to accommodate all the leaves expected to be collected in Ocean County on an annual basis. The estimate of available capacity at the permitted sites that have executed Agreements is based on facility permits, site tours, guidance from our consultants and discussion with the site supervisors.

The County approach is to provide equipment and manpower to process the leaves at each regional site every 4-6 weeks. The equipment package consists of a windrow turner, compost screen, front end loader and tub grinder. The County has ordered the equipment with contractual agreements that it will be delivered before September 1, 1988. The equipment package cost is \$420,000. The tub grinder will chip brush and small branches. The funding of the crew is estimated at \$170,000. and it is included in the County 1988 budget and the County is in the process of hiring staff. The use of this equipment will accelerate the decomposition process and produce a compost of uniform high quality.

The municipalities are responsible for daily supervision of their permitted sites and they establish criteria for the delivery of leaves to their sites including: hours of operation and record

keeping. The host municipality has first rights to the leaf compost and the remainder will be distributed for use by County residents, municipalities and other County departments.

The County has established a Leaf Composting Service Area which includes an estimate of the generation rate for each municipality. If Interlocal Services Agreements are executed by Manchester, Jackson and Lacey Townships, the County will revise the Service Areas. Brick Township has submitted a permit application to the New Jersey Department of Environmental Protection. Upon the issuance of this permit by the Department, the Brick Township facility will be a regional composting site. Until the Brick Township facility receives a NJDEP permit, Brick, Point Pleasant Borough, Point Pleasant Beach, Bay Head and Mantoloking are directed to the Lakewood site. When the Brick Township facility is permitted, the County will revise the Service Areas to direct these municipalities to the Brick site.

The Service Areas for the entire County are contained in the table in the Appendix.

Modification of District Recycling Plan (Section 8.0)

The establishment of a mandatory recycling program at the County level is a new and challenging enterprise. Conditions in recycling markets can be expected to change and new techniques for processing materials may evolve that will permit the recycling of materials in addition to those presently designated. Therefore, the adopted plan included a procedure to permit the modification of the elements of the District Recycling Plan in a less cumbersome process than that required for amendments to the District Solid Waste Management Plan. The Plan provides that upon the review and recommendation of the Solid Waste Advisory Council and following the adoption by Resolution of the Board of Chosen Freeholders, any element of the District Recycling Plan may be revised or otherwise changed and will take effect immediately unless otherwise referenced in the Board's Resolution.

In order to ensure opportunity for public comment the County will provide legal notice and a public hearing on proposed modifications. This section is therefore modified to require that upon the direction and authorization of the Board of Chosen Freeholders, the Ocean County Solid Waste Advisory Council will conduct a public hearing on the proposed modifications to the District Recycling Plan. The County will provide a legal notice in the newspaper of general circulation 10 days prior to the hearing. In addition, the County will keep the hearing record open 10 days after the public hearing. Once the hearing record is closed, the Solid Waste Advisory Council will review the record and then forward a recommendation and a copy of the hearing record to the Board of Chosen Freeholders. The Board will then act to modify the Recycling Plan.

APPENDICES

Report Upon
Ocean County Solid Waste
Generation, Composition
And
Recycling Potential



April, 1988

GBB-Killam

Consultants in Solid Waste/Resource Recovery

GBB-Killam

2735 Hartland Road
Falls Church, VA
22043

703/573-5800

201/379-3400

April 19, 1988

Mr. Steven Pollock
Ocean County Planning Director
Ocean County Administration Building
CN 2191
Toms River, N.J. 08754

RE: Solid Waste Weighing and
Composition Study
ETK 122102

Dear Mr. Pollock:

The enclosed report details the results of the work that GBB-Killam has completed on the 1987-1988 Solid Waste Weighing, Compostion and Recycling Potential Study. The study has documented the waste flow quantities to the private Ocean County landfills, the percentages of the various waste fractions, and the estimated amounts of the designated recyclables in the County.

As always, it has been a pleasure for the GBB-Killam team to work for the County on this project. We wish to thank the Planning Board staff for their help in providing valuable data which was used in the preparation of this report.

If you have any questions, please feel free to contact our Millburn office.

Very truly yours,

GBB-KILLAM



Albert J. Mellini, P.E.
Project Manager

Ocean County Resource Recovery Project

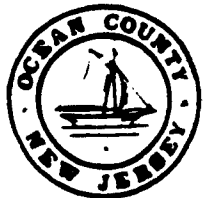


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GBB-Killam wishes to express its thanks and wishes to acknowledge the following individuals and groups who aided in the preparation of this report.

Ocean County Board of Chosen Freeholders
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Ocean County Planning Board
Steven Pollock, Director
Alan Avery, Assistant Director
John Haas, Principal Planner

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Division of Solid Waste Management

Ocean County Landfill Corporation
Charles Hesse, President

Southern Ocean Landfill, Inc.
Joseph Caldeira, President

Ocean County Counsel
John Sahradnik, Assistant Counsel

Ocean County Citizen Advisory Committee
on Resource Recovery

Ocean County Solid Waste Advisory Council

The Preparation of this Report
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EXECUTIVE SUMMARY

The successful development and implementation of two regional recycling centers and a resource recovery facility requires substantial planning to determine the quantities of each component of the waste stream (recyclable and non-recyclable) to ensure that the regional recycling centers, proposed in the Ocean County recycling Plan, are properly sized, designed and staffed and to ensure that the proposed resource recovery facility is properly sized to dispose of the remaining combustible waste in the County. In addition the Btu value (heat content) of the waste is needed to determine the energy input to the resource recovery facility. In recognition of this, GBB-Killam performed a solid waste weighing and composition study during August of 1987 and a second composition study in January of 1988. This report presents the findings of the studies.

In order to quantify the amount and composition of solid waste being disposed of in the County, by each municipality, a one (1) week weighing and composition program was conducted from August 24 through 29, 1987 at both the Ocean County Landfill Corporation (OCLF) and Southern Ocean Landfill Incorporated (SOLF) disposal facilities. Daily weighing of refuse vehicles was conducted by GBB-Killam staff at both landfills for the six day period.

A second composition study was conducted from January 11 through January 15, 1988 to determine if the County's solid waste composition varied seasonally. The GBB-Killam crew performed 25 sorts and analyzed the material for its component percentages. No caloric laboratory analysis was performed on the January samples. The results of the work showed that with the exception of yard waste, the County's waste composition remained very consistent between the summer and winter seasons.

A second weighing study was not performed in January because: 1) the results of the August study correlated well with the August data provided by the

landfills; 2) the data from the NJDEP and the private landfills was comprehensive and encompassed an entire year of waste quantities; and, 3) a principal objective of the August study was to obtain waste densities for the Waste Type 10, 13, and 27 waste and this did not have to be repeated in January.

The results of the weighing program indicated that during the period of August 24 through 29, 1987, Ocean County disposed of 8,841 tons of solid waste or 1,263 tons per day (tpd) on a seven (7) day basis. This total can be broken down by New Jersey Department of Environmental Protection (NJDEP) waste type as follows:

Waste Type 10	-	992 tpd (Residential/Commercial)
Waste Type 13	-	206 tpd (Bulky Waste)
Waste Type 27	-	<u>65</u> tpd (Non-hazardous Industrial)
Total	-	1,263 tpd

The municipal origin of the waste disposed of during the 6 day program is described in Chapter 4.

Details on the computation of the County's waste flow are contained in Chapter 4. Based upon the 1987 NJDEP solid waste reports, as shown on Table E-1, and as confirmed with OCLF and SOLF landfill records for solid waste disposal, the annual average waste quantities for Ocean County are estimated as follows:

	<u>Type 10</u>	<u>Type 13</u>	<u>Type 27</u>	<u>Total</u>
1987 Tons Per Year Disposed (After Est. 1987 Recycling)	370,300	160,100	5,100	535,500
1987 Tons Per Year Generated (Before Est. 1987 Recycling)	422,200	160,100	5,100	587,400

TABLE E-1
ESTIMATED 1987 NJDEP WASTE QUANTITIES FOR ALL WASTE TYPES

MUNICIPALITY	ESTIMATED WASTE TYPE 10 QUANTITIES	ESTIMATED WASTE TYPE 10 QUANTITIES	ESTIMATED WASTE TYPE 13 QUANTITIES	ESTIMATED WASTE TYPE 13 QUANTITIES	ESTIMATED WASTE TYPE 27 QUANTITIES	ESTIMATED WASTE TYPE 27 QUANTITIES
	CUBIC YARDS	TONS	CUBIC YARDS	TONS	CUBIC YARDS	TONS
BARNEGAT	27,152	8,081	10,471	2,800	0	0
BARNEGAT LIGHT	6,418	1,910	1,365	365	0	0
BAY HEAD	7,164	2,132	6,782	1,813	0	0
BEACH HAVEN	14,072	4,188	9,223	2,466	0	0
BEACHWOOD	23,329	6,943	2,848	762	0	0
BERKELEY	86,027	25,603	18,488	4,943	2,312	0
BRICK	142,192	42,319	69,017	18,454	32	0
DOVER	324,598	96,607	124,632	33,324	14,787	0
EAGLESWOOD	5,547	1,651	1,504	402	0	0
HARVEY CEDARS	6,090	1,813	2,539	679	0	0
ISLAND HEIGHTS	5,223	1,555	519	139	0	0
JACKSON	57,352	17,069	78,617	21,020	0	0
LACKY TWP	57,081	16,988	34,521	9,230	0	0
LAKEHURST	9,703	2,888	9,698	2,593	0	0
LAKEWOOD	74,137	22,065	53,570	14,324	184	0
LAVALLETTE	11,245	3,347	3,213	859	0	0
LITTLE EGG HARBOR	34,899	10,387	22,501	6,016	0	0
LONG BEACH	48,584	14,459	37,422	10,006	0	0
MANCHESTER	43,776	13,029	18,465	4,937	0	0
MANTCLOKING	2,311	688	3,702	990	0	0
OCEAN TWP.	17,925	5,335	5,582	1,493	0	0
OCEAN GATE	5,577	1,660	2,524	675	0	0
PINE BEACH	7,922	2,358	434	116	0	0
PLUMSTEAD	9,796	2,915	4,117	1,101	0	0
PT. PLEASANT BORO	57,079	16,988	23,452	6,270	0	0
PT. PLEASANT BEACH	17,958	5,345	5,857	1,566	0	0
SEASIDE HEIGHTS	17,583	5,233	3,106	831	0	0
SEASIDE PARK	9,778	2,910	4,410	1,179	0	0
SHEP BOTTOM	10,060	2,994	4,567	1,221	0	0
SC. TOMS RIVER	15,052	4,480	6,412	1,714	0	0
STAFFORD	60,060	17,875	17,192	4,597	0	0
SURF CITY	12,282	3,655	2,063	552	0	0
TUCKERTON	16,295	4,850	9,729	2,601	53	0
TOTAL 1987	1,244,269	370,318	598,543	160,038	17,369	53

NOTES:

1. Waste quantities are from NJDEP estimated values for 1987 as reported in cubic yards.
2. Tonnages are computed from NJDEP values with Killam weigh program computed densities for each waste type.
3. Waste Type 10 = Residential-Commercial Waste; Type 13 = Commercial Waste; Type 27 = Non-Haz. Industrial

The second element of the study was to determine the estimated composition and corresponding heating value of the Type 10 municipal solid waste (MSW). This was accomplished through a solid waste sorting program conducted by GBB-Killam concurrently with the August weigh program. A total of 28 sorts were conducted during the week at both OCLF and SOLF. Each of these sorts consisted of manually separating 200 pound samples into both combustible and non-combustible components. Table E-2 presents the average composition of the County's solid waste (Waste Type 10) and represents data obtained from 21 of the County's 33 municipalities from the August program. The composition data is important for the following reasons:

- o The Mandatory Recycling Act requires that the municipal recycling targets be based on a current waste composition study. While the recycling targets contained in the Ocean County Recycling Plan reflect the best data that was available at the time of Plan adoption, the Plan clearly states that recycling targets can be revised based on the results of this study.
- o- It allowed verification that there was a sufficient volume of the four designated recyclable materials present in the total municipal solid waste stream to achieve the Act's mandated 15 and 25 percent recycling targets.
- o- It provides data, in conjunction with laboratory analysis, necessary to derive residue estimates for the proposed resource recovery facility.
- o- It provides information on the combustion value of the non-recycled materials to be incinerated at the resource recovery facility.

Also included in Table E-2 are the heating values of the solid waste which was sampled during the week of August 24, 1987. The combustible components of the Type 10 waste stream had an average heat value of 6,150 Btu/pound (not shown on Table E-2). However, the proposed resource recovery facility will receive both combustible and some non-combustible solid waste. The average heat value of all of the Type 10 waste was 5,365 Btu/pound as shown on Table E-2.

TABLE E-2

SOLID WASTE COMPOSITION - WASTE TYPE 10
FROM AUGUST 24 THROUGH AUGUST 29, 1987
WASTE SORTS

<u>SOLID WASTE COMPONENT</u>	<u>PERCENT COMPOSITION</u>	<u>MOISTURE (LBS.)(1)</u>	<u>ASH (LBS.)</u>	<u>HEATING VALUE OF COMPONENT (Btu.'s)</u>	<u>FRACTIONAL HEAT VALUE (Btu./lb.)</u>
Newsprint	8.95	1.28	0.08	7276	651
Corrugated	1.20	0.11	0.03	7162	86
Other Paper	29.56	1.45	1.45	5955	1760
Textiles	4.79	0.29	0.05	9127	437
Plastic-Rigid	4.55	0.19	0.02	17032	775
Plastic-Film	4.18	0.50	0.007	16582	693
Food Waste	15.75	11.42	0.40	2329	370
Wood	0.44	0.09	0.009	6654	29
Yard Waste	14.64	7.85	1.18	3359	492
Sweepings	<u>3.11</u>	1.18	0.70	2329	72
COMBUSTIBLE	87.17				
Ferrous	2.91	0	2.91	0	0
Aluminum	1.17	0	1.17	0	0
Non-Ferrous	0.09	0	0.09	0	0
Glass	8.35	0	8.35	0	0
Brick	0.00	0	0.00	0	0
Ceramics	<u>0.31</u>	0	0.31	0	0
NON-COMBUSTIBLE	12.83				
TOTALS:	100.00%	28.98	16.76		5,365 Btu./lb.
					Total

(1) Based on 100 pound sample.

Note: Moisture, Ash, Heating Value and Fractional Heat Value are from Laboratory Analysis.

Table E-2 also presents the pounds of moisture and ash measured in a 100 pound sample of MSW. Calculations were made based on a 100 pound sample for conversion to percentages. The winter program also established waste component percentages but did not involve any caloric laboratory analysis. To establish an average waste composition by component, we deleted yard waste from the summer program and averaged the winter and summer percentages. The actual winter and summer percentages as well as the average percentages are included in Table E-3. As shown on the Table, the four County designated recycables (Newspaper, aluminum cans, ferrous metal (tin cans), and glass containers) amount to 28.6% of the Waste Type 10 stream. In addition, corrugated paper, which is largely recycled now by the commercial sector, represents an additional 4.1% of the Type 10 waste stream.

In order to determine the composition of dry non-hazardous industrial waste (Waste Type 27), a literature review was conducted on the components of industrial waste by type of industry in Ocean County. Based upon the existing data and the literature review, we estimate the heat value of the Type 27 waste to be 7,172 Btu/lb. The resource recovery facility will incinerate both Waste Type 10 and 27. Therefore, for August 1987, the composite waste heating value (based on weighted tonnages described in the main body of the report) of the waste ID 10 and 27 is 5,390 btu/lb.

The third element of the study was to determine the amount of recyclable material by municipality. As mentioned earlier, the August composition study separated the waste of 21 municipalities into the component waste streams. In January of 1988, the waste from 13 municipalities was separated. Overall, we judge that a sufficient percentage of the County had their waste classified during the two studies to allow for composition estimates for each of the County's municipalities.

TABLE E-3

WASTE TYPE 10 COMPONENT PERCENTAGES

<u>WASTE CATEGORY</u>	<u>WINTER SORT AVG PERCENT</u>	<u>SUMMER SORT AVG PERCENT</u>	<u>SUMMER SORT AVG PERCENT MINUS YARD WASTE</u>	<u>ANNUAL AVG COMPOSITION(1)</u>
NEWSPRINT (2)	8.1	9.0	10.5	13.1
CORR. PAPER	2.3	1.2	1.4	4.1
OTHER PAPER	34.4	29.6	34.6	31.5
TEXTILES/RAGS	5.9	4.8	5.6	5.2
PLASTIC-RIGID	6.4	4.6	5.3	5.4
PLASTIC-FILM	3.1	4.2	4.9	3.7
FOOD WASTE	16.9	15.8	18.5	16.1
WOOD	0.7	0.4	0.5	0.5
YARD WASTE	1.7	14.6	0.0	0.8
SWEEPINGS	3.8	3.1	3.6	3.4
FERROUS (2)	4.1	2.9	3.4	4.1
ALUMINUM (2)	1.2	1.2	1.4	1.3
NON-FERROUS	0.3	0.1	0.1	0.2
GLASS (2)	10.2	8.4	9.8	10.1
BRICK	0.0	0.0	0.0	0.0
CERAMICS/FINES	<u>0.8</u>	<u>0.3</u>	<u>0.4</u>	<u>0.5</u>
TOTAL	100.0%	100.0%	100.0%	100.0%

- (1) Based on both Summer and Winter Programs, the estimated overall combustible waste fraction is 84% of the total Waste Type 10. The percentages have been corrected to compensate for the fact that some recyclables were source separated prior to sorting at the landfills.
- (2) County designated recyclable.

Table E-4 is a municipal breakdown of the tonnages of the County's designated recyclable materials.

Based on the laboratory caloric testing, we estimate that 16% of the Waste Type 10 would remain as residue after incineration. This would amount to approximately 60,000 tons per year of Type 10 residue on a dry weight basis. In practice, the total weight would be about 25% higher due to the addition of water to the ash. This quantity could also increase if portions of Waste Type 13 are tipped at the resource recovery facility.

Conclusions:

1. This study has provided the County with the most comprehensive database of information on the quantities, composition and energy value of the County's solid waste which has been conducted to date.
2. The NJDEP and the private landfill waste quantity data is complete and accurate. The study has determined the amounts of waste by municipality and by Waste Type (i.e., Type 10, 13, and 27).
3. The study has estimated that there are 1,156 tons per day of Waste Type 10 and about 15 tons per day of Waste Type 27. After recycling 25% of the Waste Type 10, the resultant waste quantity which could be incinerated in the proposed resource recovery facility would equal about 880 tons per day. Assuming an on-line availability of 82% of an 1,050 ton per day resource recovery facility, the plant would have an average throughput capacity of about 860 tons per day. Therefore, the 1,050 ton per day sizing of the facility would dispose of the anticipated 1987 Waste Type 10 and 27 load. The above figures are all annual averages. The waste stream will exceed the capacity of the plant during the summer peak.

TABLE E-4
WASTE TYPE 10 QUANTITIES OF DESIGNATED RECYCLABLES

Municipality	Proposed Recycling Center	Estimated 1987 Waste Type 10 Tons Generated (2)	Estimated Available Newspaper Tons (13.1%)	Estimated Available Aluminum Tons (1.3%)	Estimated Available Glass Tons (10.1%)	Estimated Available Ferrous Tons (4.1%)	Estimated Available Total Recyclable Tons 100% Capture
Barnegat Twp.	South	8,081	1,059	105	915	331	2,311
Barnegat Light	South	2,213	290	29	224	91	633
Bay Head Boro	North	2,132	279	28	215	87	610
Beach Haven	South	4,321	566	56	436	177	1,236
Beachwood Boro	North	6,989	916	91	706	287	1,999
Berkeley Twp.	Both	27,463	3,598	357	2,774	1,126	7,854
Brick Twp.	North	46,831	6,135	609	4,730	1,920	13,394
Dover Twp.	North	102,397	13,414	1,331	10,342	4,198	29,285
Eagleswood Twp.	South	1,692	222	22	171	69	484
Harvey Cedars	South	1,813	237	24	183	74	518
Island Heights	North	1,554	204	20	157	64	445
Jackson Twp.	North	17,645	2,312	229	1,782	723	5,046
Lacey Twp.	South	18,208	2,385	237	1,839	747	5,208
Lakehurst Twp.	North	2,888	378	38	292	116	826
Lakewood Boro	North	26,799	3,511	348	2,797	1,099	7,664
Lavellette Boro	North	3,464	454	45	350	142	991
Little Egg Harbor	South	10,695	1,401	139	1,080	438	3,059
Long Beach Twp.	South	14,683	1,923	191	1,483	602	4,199
Manchester Twp	North	15,581	2,041	203	1,574	639	4,456
Mantoloking Boro	North	698	90	9	69	28	197
Ocean Twp.	South	5,564	729	72	562	228	1,591
Ocean Gate Boro	North	1,660	217	22	166	69	475
Pine Beach Boro	North	2,381	312	31	240	96	681
Plumsted Twp.	North	2,915	382	38	294	120	834
Point Pleasant Boro	North	17,996	2,357	234	1,819	738	5,147
Point Pleasant Beach	North	5,731	751	74	579	235	1,639
Seaside Heights Boro	North	5,326	698	69	538	218	1,523
Seaside Park Boro	North	2,910	381	38	294	119	832
Ship Bottom Boro	South	2,994	392	39	302	123	856
South Toms River	North	4,480	587	58	452	184	1,281
Stafford Twp.	South	19,368	2,537	252	1,956	794	5,539
Surf City Boro	South	3,655	479	48	369	150	1,045
Tuckerton Boro	South	4,949	648	64	500	203	1,415
TOTALS		396,064	51,884	5,149	40,002	16,239	113,274

NOTES:

- (1) North Recycling Center in Lakewood; South Recycling Center in Stafford.
- (2) Total tons equals NJDEP 1987 adjusted Waste Type 10 figures converted with weigh program densities with projected 1987 recycling quantities added. Recycling numbers only include newspaper, corrugated, aluminum, ferrous, and glass.

File TABLE-4

Based on the County's projected population growth, the total Waste Type 10 & 27 would increase to about 990 tons per day (after recycling 25%) in 1992 and about 1,135 tons per day in 2000.

4. The August weighing program resulted in the accurate computation of densities for the three Waste Types. These values allow conversion of the NJDEP and private landfill data from cubic yards (which they both report in) to tons.

5. The study has determined the composition of the solid waste stream. The County now can estimate the amounts of the 4 designated recyclables (i.e., newspaper, glass, aluminum, and ferrous) which are present in the waste stream of each municipality. When the State recycling goals are compared with both the municipal and County totals, the County can now evaluate goal compliance and determine if more materials need to be designated in order to achieve the State goal.

6. The study has estimated the energy value of the Type 10 solid waste. This will enable the County to prepare a performance specification for a full service operator to design, construct and operate the proposed resource recovery facility. The study determined that the energy content of the County's Type 10 waste stream is typical with the values obtained elsewhere in the State. In addition, the study determined that, with the exception of yard waste, the composition of the County's waste does not significantly vary seasonally.

7. The study determined the residue and ash content of the Type 10 waste. Based on the caloric measurements and the composition of the waste stream, we estimate that 17% of the incoming Type 10 waste would require landfill disposal as residue (See Table E-2). If portions of the Type 13 waste are tipped at the facility, the residue quantities will increase, however.

1.0 INTRODUCTION

The most critical ingredient to the successful development of regional recycling centers and a resource recovery facility is information regarding waste generation rates (tons of waste per day or year), waste composition (percentage of paper, aluminum, glass, etc., and how much energy is contained in the waste). Facility sizing, economic forecasts, capital and operating costs, and tipping (disposal) fees are dependent on the volume of waste which can be recycled and the volume remaining for disposal at the resource recovery facility. Successful financing of both projects may also depend upon a "put-or-pay" contract on the part of the County which will guarantee to each facility operator, a certain quantity of solid waste. To obtain this information, a one week solid waste weighing study was performed from August 24 to August 29, 1987 by GBB-Killam staff at OCLF and SOLF.

The material composition of the solid waste is similarly important to the successful development of the recycling centers and the resource recovery facility. The amount of energy (BTU's) in the solid waste will affect the revenues which can be realized from the sale of steam or electricity. The resource recovery facility is actually a "heat recovery" machine in that the BTU value of the waste as well as the tons of waste input to the facility determine the system capacity and the ability to process waste. Therefore, a thorough analysis of the constituents of the waste stream (both combustible and non-combustible components) is required for accurate economic projections and facility sizing.

Two composition programs were conducted to obtain information regarding the energy content and component make-up of the waste stream. Samples of the County's solid waste were manually sorted, weighed, and analyzed by a laboratory for proximate and ultimate analysis. The programs were conducted from August 24 to 29, 1987 and from January 11 to 16, 1988 to determine the seasonal fluctuation, if any, of the waste components; i.e. does the County produce more paper in the summer than in the winter?

The estimation of waste composition is more difficult than the determination of waste quantity for a number of reasons. First, unlike waste quantities, the determination of waste composition involves the measurement of more than one characteristic (as many as sixteen waste constituent were identified and measured in the waste samples collected). Second, while the determination of waste quantities essentially involved the stationing of GBB-Killam personnel at the landfills to obtain weigh data and waste type information, waste sampling and separation is a labor-intensive and somewhat subjective procedure. Third, historical trends in waste composition from other communities for comparison purposes is not readily available.

The approach to conducting the solid waste composition program included the hand sampling and segregation of residential and commercial solid waste and a literature search to determine the industrial waste composition based upon the waste composition by type of industry. The literature search was used to resolve the problem of qualitatively assessing industrial wastes which are often delivered to the point of disposal in a form which makes the selection of representative samples very difficult, i.e. an entire truckload of wood scrap or plastic trimmings.

The goals of the project are:

- o To estimate the amount of solid waste in Ocean County based on a one week weighing study;
- o To determine the composition of the County's waste based on 2 one week composition studies and to determine if the composition of the waste varies seasonally;
- o To determine the energy content of the County's waste by conducting test burns of the combustible portion of the waste stream under laboratory conditions;

- o To determine if there is a sufficient amount of the four County Recycling Plan designated materials to achieve the recycling target of 15% and 25% waste recycling for each municipality;
- o To determine the amount of residue and ash which can be expected after incinerating the County's Type 10 and 27 waste;
- o To determine accurate waste densities for the Type 10, 13, and 27 waste.

2.0 DATA COLLECTION AND ANALYSIS

2.1 Ocean County Background

Ocean County has experienced a very high population growth rate over the last 30 years. In each of the last 3 census years, 1960, 1970, 1980, Ocean County has led the state in population growth. Ocean County is also a coastal county, with one of its major features being 50 miles of beach front on the Atlantic Ocean and Barnegat Bay. The influx of tourists gives the effect of almost doubling the population of the County during the summer months.

As Ocean County has experienced growth so has the volume of solid waste produced that had to be disposed of. Ocean County also faces a summer solid waste "peak" due to the large number of tourists. The solid waste disposal trend for 1987 for Ocean County is presented in Figure 2-1. This data was provided by OCLF and SOLF for waste disposed at their facilities, on a monthly basis, for 1987. The summer tourism corresponds to the volume of waste disposed, in general, starting in May and dropping off near the end of September. The "baseline" or year round population of Ocean County can be compared with the February OCLF disposal rates.

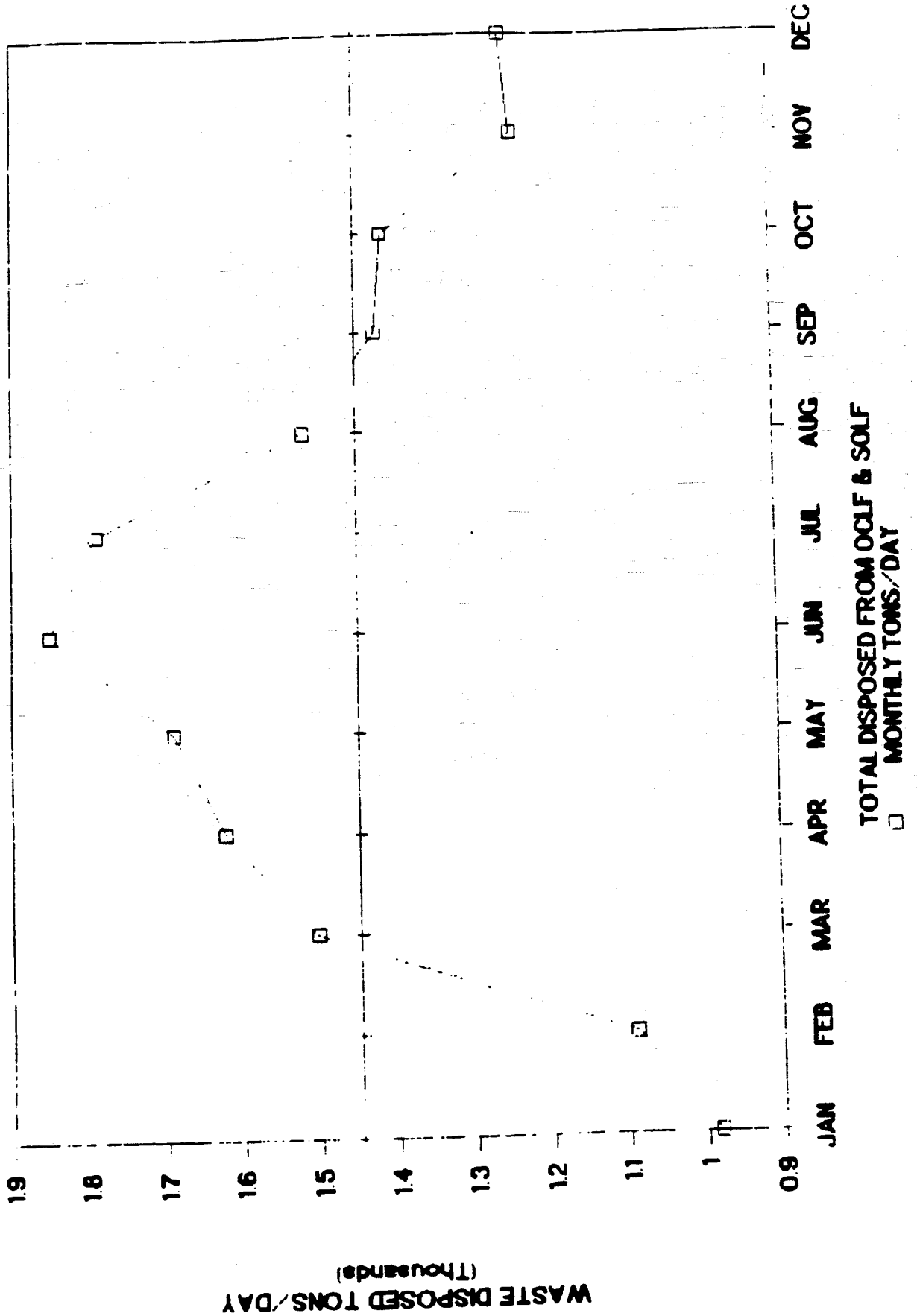
2.2 Prior Solid Waste Generation Studies

Three solid waste weighing study programs were conducted in January of 1984 at four landfills; and in March and August of 1984 at the three largest landfills. The January and March studies were performed to define the baseline (winter) loading of solid waste. The results showed that Ocean County generated 880 total tons/day in January and 1090 total tons/day in March. A two week program was conducted in August, to define the summer "peak" generation. The results showed that Ocean County generated 1,463 total tons/day during August. The January and March programs consisted of truck counts and relied on average vehicle payload densities from extensive weigh programs conducted by Killam in

FIGURE 2-1

1987 OCEAN COUNTY SOLID WASTE DISPOSAL

SEASONAL CURVE



other Counties. The August program consisted of actual truck weighing of in-county refuse vehicles in order to determine average payload densities for refuse vehicles in Ocean County. Based upon the three weigh programs, the annual waste disposed of in Ocean County for 1984 was estimated at 435,445 tons.

2.3 NJDEP And Private Landfill Records

There are two other principal sources of data on quantities of solid waste disposed of in Ocean County. These are the NJDEP and the individual records of the private landfills. In 1987, the NJDEP reported that 1,860,182 cy or 535,500 tons of waste were disposed of in Ocean County. This data from NJDEP was consistent with the data provided to us by the private landfills.

Details on the estimated quantities of both solid waste generated, recycled and disposed are provided in Section 4.

3.0 SOLID WASTE WEIGHING FIELD PROGRAM

3.1 Introduction

A field study was performed from August 24 to 29 to determine the quantity of residential, commercial and industrial solid waste disposed of in the County. The investigation involved one week of weighing all commercial and residential vehicles which hauled waste from any of Ocean County's 33 municipalities to OCLF and SOLF. Field crews were stationed at both facilities to record information regarding truck type, size, municipality of origin, waste type and quantity.

3.2 Daily Vehicle Weighing

Neither OCLF or SOLF were equipped with scales during our field work. Therefore, GBB-Killam used three sets of 100,000 pound capacity (accuracy of ± 10 pounds) tandem truck scales and meters from Johnson Scale Company, Caldwell, New Jersey. Johnson Scale Company set up and calibrated two units at OCLF and one unit at SOLF under the supervision of a GBB-Killam field supervisor. Incoming collection truck axles were weighed separately and added to derive the vehicle's total weight. The same procedure was followed for the vehicle as it exited the landfill to obtain a tare weight. The difference between the two sets of readings represented the weight of the load disposed. The waste type and municipality of origin were recorded from the Origin and Destination (O&D) forms. Field crews recorded truck type, capacity, hauler, and information from the O&D forms on a GBB-Killam weigh form.

Tare weight tickets were issued to drivers of refuse (compactor) trucks during the initial weighing at OCLF. This expedited the weighing process because vehicles with tare tickets needed only to be weighed upon entering OCLF and not upon exiting. Approximately 75 percent of the vehicles entering OCLF were given tare tickets during the first two days of weighing.

To obtain weigh data for the days where truck weights were not performed, Killam personnel obtained cubic yardage data from vehicles entering the landfills. Average densities were then calculated from truck weights from previous studies in Ocean County and from days where weighing was performed. These average densities were applied to the cubic yardage to obtain pounds of solid waste in a particular vehicle. Average density values used in the calculation were specific to the size and type of collection vehicle to vehicles in Ocean County. An example of this calculation procedure is presented below:

VEHICLE TYPE = Rear Load Packer (RLP)
VEHICLE CAPACITY = 20 Cubic Yards (CY)
WASTE LOAD = 20 Cubic Yards (assumed full)
AVERAGE DENSITY OF 20 CY RLP AT LANDFILL = 522 LBS/CY(1)
TOTAL WEIGHT OF LOAD = 522 LBS/CY x 20 CY = 10,440 LBS

(1) Based on 116 weights of a 20 CY Rear Load Packer at OCLF and SOLF. Details on the computation of the truck densities are contained in Section 5 of this report.

4.0 SOLID WASTE QUANTITIES

4.1 Refuse Vehicle Count

As shown in Table 4-1, 1,201 refuse vehicles were recorded entering OCLF and SOLF during the week of August 24-29, 1987. Table 4-1 also gives vehicle count by day which shows that Tuesdays and Fridays were the peak disposal days during the study.

4.2 Average Vehicle Payload Densities

Using the actual weigh data collected, average vehicle payload densities were calculated for each truck type and size at OCLF and SOLF. The average vehicle payload densities were used to compute waste tonnages from cubic yard data generated on survey days when truck weighings were not performed.

Table 4-2 lists the average vehicle payload densities calculated for vehicles disposing solid waste at OCLF and SOLF. Average Density is calculated by dividing the vehicle's solid waste load in pounds by the vehicles capacity in cubic yards (CY). The average density for an Ocean County refuse vehicle is 585 lbs/cubic yard or 3.42 cubic yards per ton (cy/ton). These densities were used in connection with cubic yardage values provided to us by the NJDEP and the private landfills.

4.3 Waste Tonnages by Municipality

The quantity of solid waste disposed in Ocean County during the August 24-29, 1987 monitoring period was calculated to be 1,263 TPD of which 992 TPD was Waste Type 10; 206 TPD was Waste Type 13; and 65 TPD was Waste Type 27. All values are expressed on a seven-day basis as shown on Table 4-3.

TABLE 4-1

TRUCK COUNTS BY LANDFILL

<u>Day</u>	<u>DATE</u>	<u>OCLE</u>	<u>SOLE</u>	<u>TOTAL</u>
Mon.	8/24	91	105	196
Tues.	8/25	144	112	256
Wed.	8/26	127	80	207
Thurs.	8/27	97	76	173
Fri.	8/28	163	102	265
Sat.	8/29	<u>72</u>	<u>32</u>	<u>104</u>
	TOTAL	694	507	1,201

TABLE 4-2

AVERAGE VEHICLE PAYLOAD DENSITIES

LEGEND:

DT: Dump Truck
 RLF: Rear Load Packer
 ROOT: Roll Off Open Top

FLP: Front Load Packer
 ROCT: Roll Off Closed Top
 TT: Transfer Trailer

Southern Ocean Landfill Corp.

VEHICLE TYPE	CAPACITY (Cubic Yards)	AVERAGE DENSITY (Lbs/Cubic Yard)	NUMBER WEIGHED(1)
DT	5	1,048	4
DT	6	2,123	1
DT	8	430	2
DT	10	504	8
DT	12	808	1
DT	15	375	2
FLP	25	369	7
FLP	31	219	1
RLP	20	442	83
RLP	25	459	54
RLP	31	478	57
ROCT	12	472	1
ROCT	20	966	2
ROCT	30	212	3
ROCT	40	636	2
ROCT	45	322	3
ROOT	10	557	2
ROOT	12	512	10
ROOT	20	564	26
ROOT	21	1,090	2
ROOT	30	401	30
ROOT	40	260	2

TABLE 4-2 (CONTINUED)
AVERAGE VEHICLE PAYLOAD DENSITIES

Ocean County Landfill Corp.

VEHICLE TYPE	CAPACITY (Cubic Yards)	AVERAGE DENSITY (Lbs/Cubic Yard)	NUMBER WEIGHED(1)
DT	4	526	4
DT	5	402	4
DT	6	479	4
DT	10	1,019	3
DT	30	317	2
FLP	30	565	1
FLP	31	713	1
FLP	32	344	1
FLP	33	586	16
FLP	34	431	4
FLP	35	334	5
FLP	40	560	17
RLP	16	615	5
RLP	20	687	37
RLP	25	690	252
RLP	31	708	74
ROCT	25	581	1
ROCT	30	652	2
ROCT	32	255	1
ROCT	40	486	3
ROCT	42	542	3
ROCT	45	566	28
ROOT	10	254	1
ROOT	20	381	1
ROOT	21	245	1
ROOT	30	530	28
ROOT	45	266	2
TT	65	653	1

(1) This number does not include trucks entering the landfills which were not weighed.

TABLE 4-3

OCEAN COUNTY SOLID WASTE GENERATION
BY MUNICIPALITY
AUGUST 24 THROUGH AUGUST 29, 1987

MUNICIPALITY	TOTAL TONS TYPE 10	TONS/DAY TYPE 10 (1)	TOTAL TONS TYPE 13	TONS/DAY TYPE 13 (1)	TOTAL TONS TYPE 27	TONS/DAY TYPE 27 (1)	TOTAL TONS	TOTAL TONS/DAY (1)
BARNEGAT TOWNSHIP	166	23.7	5	0.7	0	0.0	171	24.4
BAY HEAD/MANTOLOKING (2)	61	8.7	5	0.7	0	0.0	66	9.4
BEACH HAVEN BOROUGH	72	10.3	19	2.7	0	0.0	91	13.0
BEACHWOOD	103	14.7	3	0.4	0	0.0	106	15.1
BIRMINGHAM TOWNSHIP	402	57.4	13	1.9	9	1.3	424	60.6
BRICK TOWNSHIP	753	107.6	124	17.7	0	0.0	877	125.3
DOVER TOWNSHIP	1,472	210.3	361	51.6	411	58.7	2,244	320.6
EAGLESWOOD	27	3.9	4	0.6	0	0.0	31	4.4
HARVEY CEDARS	30	4.3	6	0.9	0	0.0	36	5.1
ISLAND HEIGHTS	22	3.1	0	0.0	0	0.0	22	3.1
JACKSON	338	48.0	218	31.1	0	0.0	456	65.1
LACEY	273	39.0	83	11.9	0	0.0	356	50.9
LAKESWOOD	451	64.4	174	24.9	0	0.0	625	89.3
LAKENURST	70	10.0	5	0.7	0	0.0	122	17.4
LAVALLETTE	91	13.0	0	0.0	0	0.0	91	13.0
LITTLE EGG HARBOR	153	21.9	0	0.0	0	0.0	153	21.9
LONG BEACH/BARNEGAT LIGHT	327	46.7	37	5.3	0	0.0	364	52.0
MANCHESTER	225	32.1	40	5.7	0	0.0	265	37.9
OCEAN TWP.	74	10.6	35	5.0	0	0.0	109	15.6
OCEAN GATE	42	6.0	0	0.0	0	0.0	42	6.0
PINE BEACH	26	3.7	0	0.0	0	0.0	26	3.7
PLUMSTED	17	2.4	10	1.4	0	0.0	27	3.9
POINT PLEASANT BEACH	67	9.6	8	1.1	0	0.0	75	10.7
POINT PLEASANT BORO	358	51.1	64	9.1	27	3.9	449	64.1
SEASIDE HEIGHTS	54	7.7	0	0.0	0	0.0	54	7.7
SEASIDE PARK	98	14.0	6	0.9	0	0.0	104	14.9
SHIP BOTTOM	73	10.4	26	3.7	0	0.0	99	14.1
SO. TONS RIVER	58	8.3	26	3.7	0	0.0	84	12.0
STAFFORD	274	39.1	44	6.3	7	1.0	325	46.4
SURF CITY	80	11.4	23	3.3	0	0.0	103	14.7
TUCKERTON	91	13.0	59	8.4	0	0.0	150	21.4
MIXED MUNICIPALITIES (3)	694	99.1	0	0.0	0	0.0	694	99.1
TOTALS	6,942	991.7	1,445	206.4	454	64.9	8,841	1,263.0

(1) Seven (7) day basis, i.e., 5.5 day total divided by 7 days.

(2) These municipalities picked up by one hauler in mixed loads for the two towns.

(3) Loads with waste from several municipalities which cannot be distributed to a particular municipality.

In order to estimate the total quantity of solid waste generated in the County, we relied upon data for all of 1987 provided to us by the NJDEP and the private landfills. The results of the August weighing program was used primarily to establish densities of the Waste Type 10, 13 and 27 waste.

The municipal breakdown of the NJDEP data showing totals of the County's Waste Type 10, 13 and 27 is included in Table 4-4. As shown on the Table, the County disposed of approximately 535,500 tons of solid waste in 1987. This waste consisted of:

	<u>TONS/YR</u>	<u>TONS/DAY</u>	<u>%</u>
Waste ID 10 (Municipal)	370,300	1015	69
Waste ID 13 (Bulky)	160,100	439	30
Waste ID 27 (Industrial)	<u>5,100</u>	<u>14</u>	<u>1</u>
TOTAL =	535,500	1,468	100

The significant fact to be derived from this data is that the Waste Type 10 generation, which is the primary source of waste for the resource recovery facility, averages about 1468 tpd. Peak summer values for the waste flow were previously shown on Figure 2-1.

The above referenced quantities were then adjusted to reflect the addition of the estimated 1987 recycling values to determine the estimated total solid waste generation. These figures include:

	<u>TONS/YR</u>	<u>TONS/DAY</u>	<u>%</u>
Waste ID 10	422,200	1,157	72
Waste ID 13	160,100	439	27
Waste ID 27	<u>5,100</u>	<u>14</u>	<u>1</u>
TOTAL =	587,400	1,610	100

TABLE 4-4
ESTIMATED 1987 NJDEP WASTE QUANTITIES FOR ALL WASTE TYPES

MUNICIPALITY	ESTIMATED WASTE TYPE 10 QUANTITIES	ESTIMATED WASTE TYPE 10 QUANTITIES	ESTIMATED WASTE TYPE 13 QUANTITIES	ESTIMATED WASTE TYPE 13 QUANTITIES	ESTIMATED WASTE TYPE 27 QUANTITIES	ESTIMATE WASTE TYPE QUANTITIES
	CUBIC YARDS	TONS	CUBIC YARDS	TONS	CUBIC YARDS	TONS
BARNEGAT	27,152	8,081	10,471	2,800	0	0
BARNEGAT LIGHT	6,418	1,910	1,365	365	0	0
BAY HEAD	7,164	2,132	6,782	1,813	0	0
BEACH HAVEN	14,072	4,188	9,223	2,466	0	0
BEACHWOOD	23,329	6,943	2,848	762	0	0
BERKELEY	86,027	25,603	18,488	4,943	2,312	0
BRICK	142,192	42,319	69,017	18,454	32	0
DOVER	324,598	96,607	124,632	33,324	14,787	4
HAGLESWOOD	5,547	1,651	1,504	402	0	0
HARVEY CEDARS	6,090	1,813	2,539	679	0	0
ISLAND HEIGHTS	5,223	1,555	519	139	0	0
JACKSON	57,352	17,069	78,617	21,020	0	0
LACKY TWP	57,081	16,988	34,521	9,230	0	0
LAKEHURST	9,703	2,888	9,698	2,593	0	0
LAKEWOOD	74,137	22,065	53,570	14,324	184	0
LAVALLETTE	11,245	3,347	3,213	859	0	0
LITTLE EGG HARBOR	34,899	10,387	22,501	6,016	0	0
LONG BEACH	48,584	14,459	37,422	10,006	0	0
MANCHESTER	43,776	13,029	18,465	4,937	0	0
MANTOLOKING	2,311	688	3,702	990	0	0
OCEAN TWP.	17,925	5,335	5,582	1,493	0	0
OCEAN GATE	5,577	1,660	2,524	675	0	0
PINE BEACH	7,922	2,358	434	116	0	0
PLUMSTEAD	9,796	2,915	4,117	1,101	0	0
PT. PLEASANT BORO	57,079	16,988	23,452	6,270	0	0
PT. PLEASANT BEACH	17,958	5,345	5,857	1,566	0	0
SEASIDE HEIGHTS	17,583	5,233	3,106	831	0	0
SEASIDE PARK	9,778	2,910	4,416	1,179	0	0
SHIP BOTTOM	10,060	2,994	4,567	1,221	0	0
SC. TONS RIVER	15,052	4,480	6,412	1,714	0	0
STAFFORD	60,060	17,875	17,192	4,597	0	0
SURF CITY	12,282	3,655	2,063	552	0	0
TUCKERTON	16,295	4,850	9,729	2,601	53	0
TOTAL 1987	1,244,269	370,318	598,543	160,038	17,369	0

NOTES:

1. Waste quantities are from NJDEP estimated values for 1987 as reported in cubic yards.
2. Tonnages are computed from NJDEP values with Killam weigh program computed densities for each waste type.
3. Waste Type 10 = Residential-Commercial Waste; Type 13 = Commercial Waste; Type 27 = Non-Haz. Industrial

5.0 SOLID WASTE COMPOSITION

5.1 Methodology

One of the factors affecting the design of a resource recovery facility is the composition of the waste being disposed i.e., the heat value of the combustible waste components. In order to determine the characteristics of Ocean County's waste, samples of solid waste disposed of during the August 1987 and January 1988 monitoring periods were separated into various components which included paper, plastic, textiles, wood, food wastes, yard wastes, glass, metal and other miscellaneous materials. To account for differences in waste composition by municipality, collection vehicles were selected from the following twenty four (24) municipalities in the County: (J = Winter program in January of 1988, A = Summer program in August of 1987)

- | | |
|------------------------|---------------------------------|
| A - Barnegat Township | A - Little Egg Harbor Township |
| A - Bayhead | A - Long Beach Township |
| A - Beach Haven Boro | A-J - Manchester Boro |
| J - Beachwood | A - Ocean Township (Waretown) |
| A-J - Berkely Township | A - Pine Beach Boro |
| A-J - Brick Township | A-J - Point Pleasant Boro |
| A-J - Dover Township | A-J - Point Pleasant Beach Boro |
| A-J - Jackson Township | A - Seaside Heights |
| A-J - Lacy Township | A-J - Stafford Township |
| J - Lakehurst | A - Tuckerton Boro |
| J - Lakewood | A - Surf City |
| J - Lavallette | |

Twenty-eight sorts were completed during the summer program and 25 sorts were completed during the winter program.

The first step of the sorting program was to determine the sample size to be sorted. The selection of sample size is important as it determines the parameters for the sorting program. Given a sampling crew size, as the sample size increases, the number of sorts that can be conducted during the day decreases. As the number of sorts decreases, the selection of representative samples of solid waste becomes a critical factor. Very large samples, such as one ton samples or entire packer trucks, rely on the ability to select representative trucks.

Studies have varied in their methodologies for selecting sample size, number of samples, and constituents sorted. The approach used for this project was to sort 200 pound samples from several vehicles daily. This decision was based on the conclusion reached by Paul W. Britton in the Proceedings of the American Society of Civil Engineers that "there was no statistically significant difference between the precision obtained from 200-lb to 300-lb. samples and the precision obtained from much larger separation samples" (Britton, Journal of the Sanitary Engineering Division, "Improving Manual Solid Waste Separation Studies.", October 1972). Later empirical research reconfirmed this. (Musa, Ho, Journal of Environmental Engineering Division, "Optimum Sample Size in Refuse Analysis," December 1981.) Prior to GBB-Killam performing the sorting study, the numbers of sorts were discussed with and approved by the NJDEP.

The number of samples selected from the municipalities was proportional to the amount of waste delivered to the landfill from a particular town. For example, Dover Township represents a large portion of the County's waste, therefore, several trucks were sampled from Dover Township. This information was used by the field crew supervisor to determine the truck sampling schedule for the day.

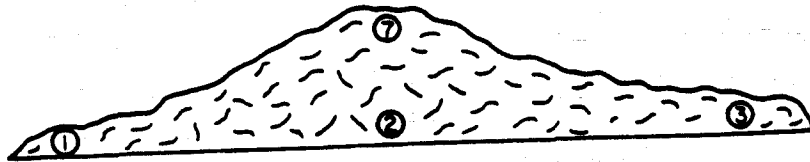
5.2 Sorting Field Operations

The summer solid waste sorting program was conducted at the Ocean County

Landfill Corporation from August 24 to 26 1987, and at Southern Ocean Landfill Corporation from August 27 to 28. The winter program was conducted January 11 to January 15, 1988 at OCLF. During this period a Killam field crew of 4-8 people was organized to sample and manually sort solid waste entering these facilities.

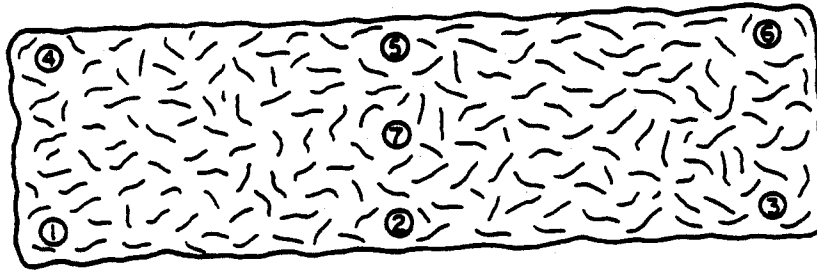
Sample selection and delivery to the sorting area was accomplished as follows:

1. As a collection vehicle deposited its load at the working face, the driver was questioned as to the area and type of pickups that were made. The crew supervisor would check the schedule to determine if a sample was required from that area.
2. If a sample was indicated, the field crew would sample representative portions of the load to obtain approximately 200 pounds of sample which was then carried back to a specially constructed sort table. (see Figure 5-1)
3. The 200 pound sample was then sorted into the categories as indicated in Table 5-1 and described in Table 5-2. The sorting area organization is depicted on Figure 5-2 and Table 5-3.
4. Samples were then sorted into individually labeled garbage cans. Each can was weighed on a portable beam balance scale. Net weights of each can were recorded on the Killam waste characterization form (Figure 5-3). Tare weights were previously recorded.
5. After completion of the weighing session, the crew supervisor would proceed to sample representative portions from the combustible categories and place them into separate sealed plastic bags for laboratory analysis. Samples were stored in double sealed lined plastic bags to prevent moisture loss. The bags were set aside in a protected area and the drums were emptied and cleaned for reuse. The same procedure was followed for each sorting event. During the summer program, 4 to 7 sorts were performed daily for a total of 28 sorts amounting to 5493 lbs (2.75 tons) of municipal refuse sorted and sampled by the end of the week. During the winter program, 4 to 7 sorts were performed daily for a total of 25 sorts amounting to 5141 lbs (2.57 tons) of waste.



SIDE VIEW

SAMPLE LOCATION POINTS



TOP VIEW

SOLID WASTE WEIGHING AND
COMPOSITION STUDY

FIGURE 5-1
SOLID WASTE LOAD
SAMPLING POINTS

Elson T. Killam Associates, Inc.
Environmental and Hydraulic Engineers
27 Market Street Millburn, New Jersey 07041



TABLE 5-1

CONSTITUENTS SORTED

Non-Combustibles (6)

aluminum
ferrous metals
other non-ferrous
glass
rock/brick
ceramics & fines

Combustibles (10)

corrugated paper
newsprint
mixed paper
plastic - film
plastic - rigid
yard waste
food waste
wood
sweepings
textiles and other rags

TABLE 5-2

GENERAL DESCRIPTIONS OF CONSTITUENTS SORTED
(Continued)

<u>Constituent</u>	<u>Description</u>
Yard Waste:	Largely grass clippings, yard cleanup (leaves and grass), small tree branches, shrub trimmings, and weeds.
Food Waste:	Kitchen scraps, left in containers where possible (e.g., plastic bags or aluminum foil).
Wood:	Small scraps of lumber used in home, furniture, tool handles, toys, and kitchen implements (spoons, etc.).
Textile and Other Rags:	Textiles, garmets, shoes, belts, and other apparel.
Ceramics and Fines:	Flower pots, ceramics

TABLE 5-3

SORTING ORGANIZATION

The sorting facility should be a covered area, preferably enclosed, of at least 600 ft² (560 m²) and the equipment should include:

Tent

Sort Table

A portable balance scale with a maximum capacity of 500 lb (27 kg).

Twenty heavy-duty, round 32-gallon (121 dm³) plastic trash containers with detachable platform casters for easy mobility (Rubbermaid Brute).

Long-sleeve coveralls for each sorting crew member.

Two or three rakes

Twelve to fifteen pairs of heavy-duty leather gloves.

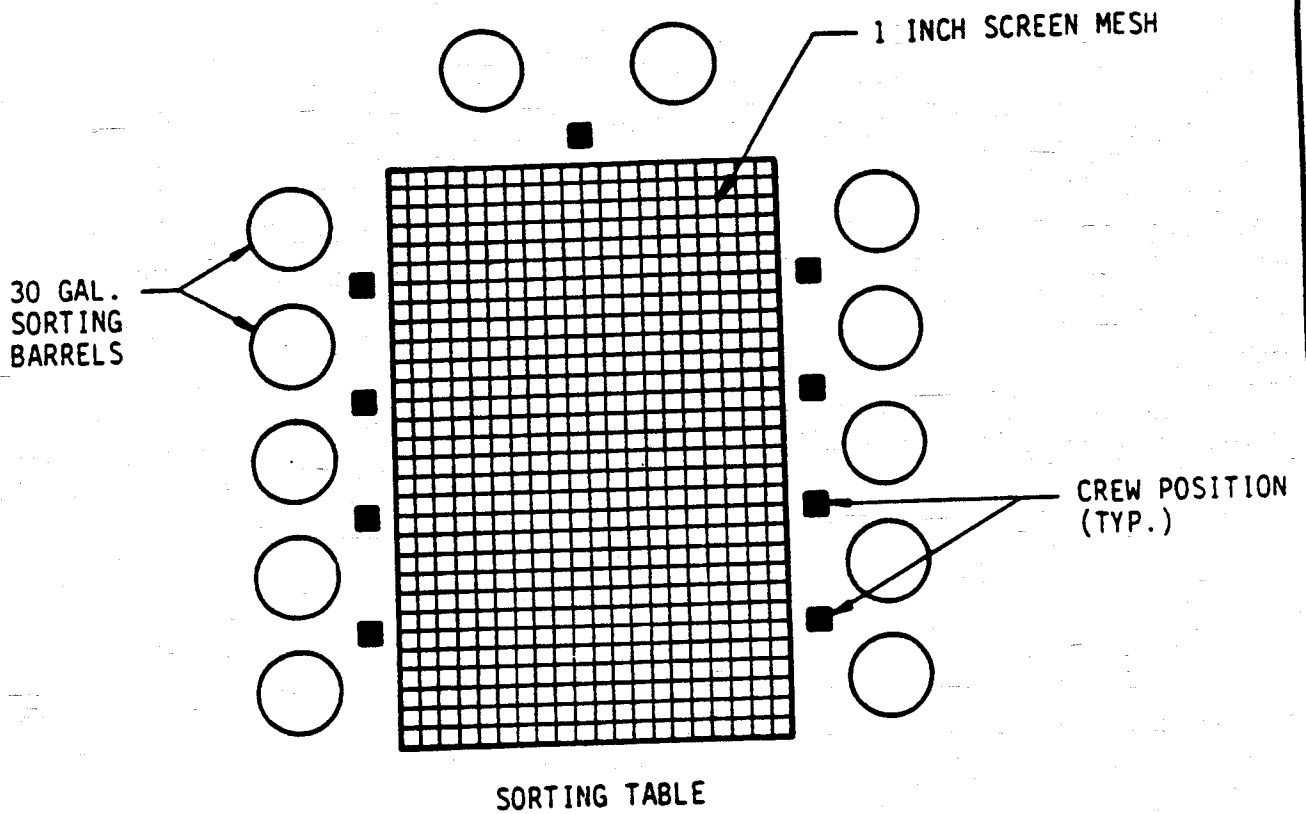
One hundred 4-mil 32-gallon (121 dm³) trash bag liners for constituent samples.

Fifty to sixty heavy corrugated cardboard boxes for sample storage.

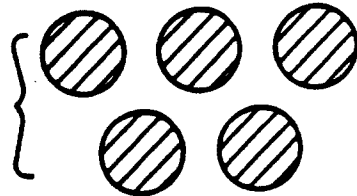
Tape and identification tags for samples.

Several small hand-held magnets for sorting metals.

Drop cloths



200-300 LB.
MSW SAMPLES



**SOLID WASTE WEIGHING AND
COMPOSITION STUDY**

**FIGURE 5-2
SORTING AREA LAYOUT**

RAW REFUSE CHARACTERIZATION SAMPLING

Recorder _____

Date _____ Truck Ident. _____ Waste Source _____

Time _____ Truck Gross Wt. _____ Truck Net Wt. _____ Page _____ of _____

CATEGORIES	PERCENT 100	TOTAL WEIGHT	BARREL NO. (NET WEIGHT)																	
1. Newsprint																				
2. Corrugated Paper																				
3. Other Paper																				
4. Textiles & Other Rags																				
5. Plastic																				
6. Food Waste																				
7. Wood																				
8. Yard Waste																				
9. Sweepings																				
10. Ferrous																				
11. Aluminum																				
12. Non Ferrous																				
13. Glass																				
14. Brick																				
15. Ceramics & Fines																				
16. OBW																				

REMARKS:

SOLID WASTE WEIGHING & COMPOSITION STUDY
 FIG 5-3
 COMPOSITION DATA FORM
 Elson T. Kham Associates, Inc.
 Environmental and Hydraulic Engineers
 27 Sussex Street Mahwah, New Jersey 07041 (NJ)

5.3 Waste Type 10 Solid Waste Composition

The "as sorted" constituent breakdown by sample for each vehicle sort for the summer program is provided in Table 5-4 and the winter program data is provided in Table 5-5. As this Table shows, there can be significant variation in refuse constituents by municipality and socio-economic area. The 21 municipalities from which refuse was sorted during August were chosen to represent all socio-economic areas within Ocean County. The composition values of all of the sorts were averaged to obtain an overall County percent composition. The County percent composition values for each constituent were applied to the estimated daily disposed tonnages of residential wastes during the August program to determine tonnages of each constituent in the total solid waste flow. This information is given in Table 5-6. The residential solid waste considered to be combustible countywide equaled 87% of the total waste measured.

5.4 Industrial Solid Waste Composition

The industrial constituent makeup was not determined utilizing the conventional sorting technique. The solid waste deliveries from industry typically are very large in size and uniform in composition and therefore cannot be practically sorted into representative samples for composition analysis. The results of a study on 363 industrial firms in New Jersey reported in the "Handbook of Solid Waste Management", Van Nostrand Reinhold Company, New York (1977), showed that industrial solid waste composition varied between industries but could be classified by the type of industry producing the wastes. The classification system used in the study was the Standard Industrial Classification (SIC) code. The solid waste composition by industrial category was compared to the SIC codes and employment data contained in the 1986-1987 edition of the New

TABLE 5-6

COMPONENT WASTE PERCENTAGES BY MUNICIPALITY

MUNICIPALITY	WASTE TYPE 10 TONS GENERATED	REUSABLE (13.1%)	COMBUSTIBLE PAPER (4.1%)	OTHER PAPER (31.5%)	TEXTILES & BAGS (5.2%)	RIGID PLASTIC (5.4%)	FILM PLASTIC (3.7%)	FOOD WASTE (16.1%)	WOOD (0.5%)	YARD WASTE (0.0%)	SHERPINGS (3.4%)	FERROUS METALS (4.1%)	ALUMINUM (1.3%)	NON-FERROUS METALS (0.2%)	GLASS (10.1%)	CERAMICS & FINES (0.5%)
Barnegat Twp.	8,001	1,059	331	2,546	420	436	299	1,301	40	65	275	331	105	16	816	40
Bay Head/Mantoloking	2,020	369	116	808	147	152	104	454	16	23	96	116	37	6	205	14
Beach Haven	4,322	566	177	1,361	225	233	160	686	22	35	147	177	56	9	437	22
Beachwood Boro	6,909	916	287	2,282	363	377	259	1,125	35	56	230	287	91	14	706	35
Berkeley Twp.	27,463	3,590	1,126	8,651	1,420	1,403	1,016	4,422	137	220	934	1,126	357	55	2,774	137
Brick Twp.	46,036	6,136	1,920	16,753	2,435	2,329	1,733	7,541	234	375	1,592	1,920	609	94	4,730	234
Dover Twp.	102,397	13,414	4,190	32,255	5,325	5,529	3,709	16,406	512	819	3,401	4,190	1,331	205	10,342	512
Englewood Twp.	1,692	222	69	533	80	91	63	272	8	14	50	69	22	3	171	8
Harvey Cedars	1,813	230	74	571	94	90	67	292	9	15	62	74	24	4	103	9
Island Heights	1,554	204	64	690	81	84	57	250	0	12	53	64	20	3	157	0
Jackson Twp.	17,665	2,311	729	5,550	910	953	653	2,041	80	141	600	729	229	35	1,702	80
Lacey Twp.	10,209	2,305	747	5,736	947	983	676	2,532	91	166	619	747	237	36	1,039	91
Lakehurst Twp.	2,800	370	110	910	150	156	107	465	14	23	90	110	38	6	292	14
Lakewood Boro	26,700	3,511	1,099	8,401	1,393	1,447	992	4,314	134	214	911	1,099	340	54	2,707	134
Lavellette Boro	3,460	450	100	1,007	100	107	120	550	17	20	110	142	45	7	350	17
Little Egg Harbor	10,695	1,401	430	3,369	556	570	396	1,722	53	86	344	430	139	21	1,000	53
Long Beach/Barnegat Lt	16,695	2,213	693	5,322	879	912	625	2,720	84	135	574	693	220	34	1,706	84
Manchester Twp.	15,581	2,041	639	4,900	810	841	576	2,309	70	125	530	639	203	31	1,574	70
Ocean Twp.	5,561	729	228	1,733	289	300	206	896	20	45	109	228	72	11	562	20
Ocean Gate Boro	1,660	217	60	523	86	90	61	267	0	13	56	60	22	3	168	0
Pine Beach Boro	2,301	312	90	750	124	129	80	303	12	19	19	90	31	5	240	12
Plumsted Twp.	2,915	382	120	910	152	157	100	469	15	23	99	120	38	6	294	15
Point Pleasant Boro	17,996	2,357	730	5,669	936	972	666	2,897	90	144	612	730	234	36	1,010	90
Point Pleasant Beach	5,731	751	235	1,005	290	309	212	923	29	46	195	235	75	11	579	29
Seaside Heights Boro	5,326	690	210	1,670	277	280	197	857	15	23	101	210	69	11	530	15
Seaside Park Boro	2,910	381	119	917	151	157	100	469	15	24	102	119	38	6	294	15
Ship Bottom Boro	2,994	392	123	943	156	162	111	482	15	24	102	123	39	6	302	15
South Toms River	4,400	587	184	1,411	233	242	166	721	22	36	152	184	58	9	452	22
Stafford Twp.	19,360	2,537	794	6,101	1,007	1,046	717	3,110	97	155	659	794	252	39	1,956	97
Surf City Boro	3,655	479	150	1,151	190	197	135	500	10	29	124	150	48	7	369	10
Tuckerton Boro	4,949	640	203	1,559	257	267	183	797	25	40	168	203	64	10	500	25
TOTALS	396,071	51,005	16,239	124,762	20,596	21,300	14,655	63,767	1,900	3,169	13,466	16,239	5,149	792	40,003	1,900

TOTAL COUNTY DESIGNATED RECYCLABLES= 113,276 TONS

NOTES:

1. All percentages from field sorts corrected for recyclables removed before landfilling.
2. Bay Head/Mantoloking and Long Beach/Barnegat Light waste was combined before sorts.
3. Tonnages are from NJDEP annual 1987 figures, adjusted and converted to tons with weigh program density figures.

Jersey Directory of Manufacturers. The largest industries were chosen to represent a sample of the industrial population in the County. Table 5-7 lists the industries and their percent composition estimations.

5.5 Laboratory Analysis

The heating content of Ocean County's Waste Type 10 was calculated on an "as received" basis and is shown in Table 5-8 by fraction. The heating value in August, 1987 was estimated to be 5,365 BTU/lb based on the ultimate analysis of 57 samples of waste sorted from the waste stream in August, 1987. The heating values were computed based on laboratory caloric testing for the August waste sorts only. No caloric testing was conducted for the January waste sorts. The heating values stated herein are for both the summer and winter waste based on the uniformity that was encountered between the summer and winter waste composition values. The energy value include both combustible and non-combustible Waste Type 10. The heating content of the waste is on the high side of the normal range to be expected in solid waste. This can be partially explained in the higher heating values that were obtained for the rigid and film plastics.

Analysis was performed on each individual fraction rather than a single composite of all fractions to define each individual fractions particular waste characteristics. Conclusions can then be made regarding recycling and changes in the waste stream as they occur and their corresponding effect on the heating value of the solid waste. The actual laboratory data sheets are included in Appendix A.

The estimated energy content of Waste Type 27 is 7,172 Btu/lb as shown on Table 5-9. The composite energy value for both Waste Type 10 and 27 was determined to be 5,390 Btu/lb based on weighted tonnages (370,300 tons of Type 10 and 5,100 tons of Type 27) of each component.

TABLE 5-7
OCEAN COUNTY SOLID WASTE GENERATION
INDUSTRIAL WASTE COMPOSITION

INDUSTRY	PRIMARY SIC CODE	PAPER	WOOD	LEATHER	RUBBER	PLASTICS	METALS	GLASS	TEXTILES	FOOD	MISC.	NO. EMPLOYEES
OLD FASHIONED KITCHEN	20	52.3	10.9	0.0	0.0	0.9	8.2	4.9	0.0	16.7	9.2	120
RYCEL WOOD PRODUCTS	24	16.7	71.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	1000
LEVEL LINE	24	16.7	71.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	300
HOWELL WOODWORK	25	24.7	42.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101
TOMS RIVER PUBLISHING	27	84.9	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150
SEACOAST PUBLICATIONS	27	84.9	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	130
URNES/BARRY PUBLICATIONS	27	84.9	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45
COBURN CORP	28	55.0	4.5	0.0	0.0	9.3	7.2	2.2	0.0	0.0	19.7	100
SAV-COTE CHEMICAL LABS	28	55.0	4.5	0.0	0.0	9.3	7.2	2.2	0.0	0.0	19.7	125
AMERICAN VITAMIN	28	55.0	4.5	0.0	0.0	9.3	7.2	2.2	0.0	0.0	13.7	48
CARDINAL ROOFING	29	72.1	6.8	0.0	0.0	15.3	4.4	0.0	0.0	0.0	1.0	70
WHEATON PLASTICS	30	56.3	5.2	0.0	9.2	13.5	0.0	0.0	0.0	0.0	0.0	120
CIBA-GEIGY CORP	30	56.3	5.2	0.0	9.2	13.5	0.0	0.0	0.0	0.0	0.0	1100
PACO PHARMACEUTICAL SERVICES	30	56.3	5.2	0.0	9.2	13.5	0.0	0.0	0.0	0.0	0.0	1264
PAECO INDUSTRIES	30	56.3	5.2	0.0	9.2	13.5	0.0	0.0	0.0	0.0	0.0	75
ATHENIA INDUSTRIES	30	56.3	5.2	0.0	9.2	13.5	0.0	0.0	0.0	0.0	0.0	160
NJ PULVERIZING CO	32	33.8	4.3	0.0	0.0	0.0	8.1	12.8	0.0	0.0	40.0	66
READE MANUFACTURING	33	41.0	11.6	0.0	0.0	5.4	5.5	2.0	0.0	0.0	29.0	100
DENZER & SCHAFER	33	41.0	11.6	0.0	0.0	5.4	5.5	2.0	0.0	0.0	29.0	45
ARNOLD STEEL	34	44.6	10.3	0.0	0.0	0.0	23.2	0.0	0.0	0.0	12.2	49
BURGUES PORCELAINS	34	44.6	10.3	0.0	0.0	0.0	23.2	0.0	0.0	0.0	12.2	35
PEIR TOOL & MACHINE	35	43.1	11.4	0.0	0.0	2.5	23.7	0.0	0.0	0.0	0.0	75
GUSNER CORP	35	43.1	11.4	0.0	0.0	2.5	23.7	0.0	0.0	0.0	0.0	125
INTERNATIONAL COMPONENTS	36	73.3	8.3	0.0	0.0	3.5	2.3	0.0	0.0	1.2	0.0	150
ACRON CORP	36	73.3	8.3	0.0	0.0	3.5	2.3	0.0	0.0	1.2	0.0	50
GLASSEAL PRODUCT INC	36	73.3	8.3	0.0	0.0	3.5	2.3	0.0	0.0	1.2	0.0	175
TORVICO ELECTRONICS	36	73.3	8.3	0.0	0.0	3.5	2.3	0.0	0.0	1.2	0.0	250
MARIN TRADING INTERNATIONAL	37	50.9	9.4	0.0	1.4	2.1	0.0	0.0	0.0	0.0	19.5	50
HARRIS & HULLOW	38	44.8	2.3	0.0	0.0	6.0	8.4	0.0	0.0	0.0	0.0	150
CENTURY PROJECTOR CORP	38	44.8	2.3	0.0	0.0	6.0	8.4	0.0	0.0	0.0	0.0	43
GETINGE INTERNATIONAL	38	44.8	2.3	0.0	0.0	5.0	8.4	0.0	0.0	0.0	0.0	58
AVERAGE COMPOSITION		53.3	12.2	0.0	1.5	5.2	5.9	0.9	0.0	0.7	7.3	204

TABLE 5-8

SOLID WASTE COMPOSITION - WASTE TYPE 10
FROM AUGUST 24 THROUGH AUGUST 29, 1987
WASTE SORTS

<u>SOLID WASTE COMPONENT</u>	<u>PERCENT COMPOSITION</u>	<u>MOISTURE (LBS.)(1)</u>	<u>ASH (LBS.)</u>	<u>HEATING VALUE OF COMPONENT (Btu.'s)</u>	<u>FRACTIONAL HEAT VALUE (Btu./lb.)</u>
Newsprint	8.95	1.28	0.08	7276	651
Corrugated	1.20	0.11	0.03	7162	86
Other Paper	29.56	6.07	1.45	5955	1760
Textiles	4.79	0.29	0.05	9127	437
Plastic-Rigid	4.55	0.19	0.02	17032	775
Plastic-Film	4.18	0.50	0.007	16582	693
Food Waste	15.75	11.42	0.40	2329	370
Wood	0.44	0.09	0.009	6654	29
Yard Waste	14.64	7.85	1.18	3359	492
Sweepings	3.11	1.18	0.70	2329	72
COMBUSTIBLE	87.17				
Ferrous	2.91	0	2.91	0	0
Aluminum	1.17	0	1.17	0	0
Non-Ferrous	0.09	0	0.09	0	0
Glass	8.35	0	8.35	0	0
Brick	0.00	0	0.00	0	0
Ceramics	0.31	0	0.31	0	0
NON-COMBUSTIBLE	12.83				
TOTALS:	100.00%	28.98	16.76		5,365 Btu./lb. Total

(1) Based on 100 pound sample.

Note: Moisture, Ash, Heating Value and Fractional Heat Value are from Laboratory Analysis

TABLE 5-9
INDUSTRIAL SOLID WASTE COMPOSITION AND HEATING VALUE
OCEAN COUNTY, NEW JERSEY

<u>SOLID WASTE COMPONENT</u>	<u>PERCENT COMPOSITION</u>	<u>FRACTION HEAT VALUE (BTU/LB)</u>
Paper	56.10	3814
Wood	23.03	1532
Plastics	8.21	1305
Rubber	4.56	510(1)
Food	0.46	11
Metals	2.62	---
Glass	0.46	---
Miscellaneous	4.86	---
<hr/>		
Total Heating Value	100.00%	7,172 BTU/LB

NOTE:

(1) BTU value based on Handbook of Solid Waste Management, Wilson, David G., 1977. All other values based on averages of the ultimate and proximate analysis of actual sample fractions sorted.

6.0 RECYCLING

6.1 Introduction

The Ocean County Recycling Plan has established recycling targets for each municipality. These targets are based on the NJDEP's guidelines of 15 percent recycling of the total waste stream in the first year of the program and recycling of 25 percent of the total waste stream during subsequent years. In addition, the Recycling Plan designates the following four materials as the initial target recyclables:

Newspaper
Glass Containers
Aluminum Cans
Ferrous Metal (Tin) Cans

The ability of the municipalities to meet their recycling targets is dependent, in part, on the quantities of each specific "recyclable" within each municipality. As part of this study, GBB-Killam evaluated the amounts of the designated "recyclables" in each municipality's waste stream.

6.2 Quantities of Recyclables

The quantities of the designated recyclables were determined by analysis of the summer (August 1987) and the winter (January 1988) composition sort data. As was explained in Section 5.2, waste from 21 municipalities were separated into individual waste components in 28 different sorts during the summer program. During the winter program, waste from 13 municipalities were separated into individual waste components in 25 different sorts. The results of the individual sorts were then averaged to produce an average waste component percentage for the County for the summer program. A similar waste average was computed for the winter program. A review of the two sets of

component percentages yielded a close match between the summer and winter programs and resulted in us concluding that the waste composition does not experience seasonal variation. The only exception to this is that a correction for the "yard waste" which was encountered in the summer program was made. Before annual averages for the two programs were computed the yard waste from the summer composition study was deducted and the percentages were re-adjusted. In addition, an adjustment was made based on the fact that the waste that was sorted at the landfill had already undergone source separation of some materials prior to it being disposed. Therefore, a calculation was made as to the material that was removed so that the percentages that are presented herein are accurate representations of the amount of recyclables in the waste stream. This data is presented in Table 6-1.

The annual average percentages for the designated recyclables were then multiplied times the waste ID 10 tonnages for each municipality as reported to us by municipality by the NJDEP. This computation resulted in an amount of for each designated recyclable for each municipality. These numbers are presented in Table 6-2. As shown on the Table, the County designated recyclables (Newspaper, aluminum cans, glass containers, and ferrous metal (tin) cans) amount to 28.6% of the Waste Type 10 in the County.

6.3 Residue Quantities

The August composition program included caloric laboratory analysis of the combustible portion of the Waste Type 10. Based on this analysis, 16.76% of the total incoming waste would require disposal in a landfill as residue. Of this percentage, 12.83% is from the non-combustible fraction of the Waste Type 10 stream while 3.93% is the ash from the combustible portion. To put this into perspective, if 1000 tons of Waste Type 10 is incinerated, 128.3 tons of non-burnable residue would remain and 39.3 tons of ash would remain. The non-burnable residue is composed of ferrous scrap, aluminum, non-ferrous metal, glass, brick and ceramics. Of the 12.83% residue, 8.35% is glass. As the County's recycling system begins to reclaim the aluminum, glass and ferrous from the waste stream, the amount of residue requiring landfill disposal will dramatically decrease.

TABLE 6-1
WASTE TYPE 10 COMPONENT PERCENTAGES

<u>WASTE</u> <u>CATEGORY</u>	<u>WINTER SORT</u> <u>AVG PERCENT</u>	<u>SUMMER SORT</u> <u>AVG PERCENT</u>	<u>SUMMER SORT</u> <u>AVG PERCENT</u> <u>MINUS YARD WASTE</u>	<u>ANNUAL AVG</u> <u>COMPOSITION (1)</u>
NEWSPRINT (2)	8.1	9.0	10.5	13.1
CORR. PAPER	2.3	1.2	1.4	4.1
OTHER PAPER	34.4	29.6	34.6	31.5
TEXTILES/RAGS	5.9	4.8	5.6	5.2
PLASTIC-RIGID	6.4	4.6	5.3	5.4
PLASTIC-FILM	3.1	4.2	4.9	3.7
FOOD WASTE	16.9	15.8	18.5	16.1
WOOD	0.7	0.4	0.5	0.5
YARD WASTE	1.7	14.6	0.0	0.8
SWEEPINGS	3.8	3.1	3.6	3.4
FERROUS (2)	4.1	2.9	3.4	4.1
ALUMINUM (2)	1.2	1.2	1.4	1.3
NON-FERROUS	0.3	0.1	0.1	0.2
GLASS (2)	10.2	8.4	9.8	10.1
BRICK	0.0	0.0	0.0	0.0
CERAMICS/FINES	<u>0.8</u>	<u>0.3</u>	<u>0.4</u>	<u>0.5</u>
TOTAL	100.0%	100.0%	100.0%	100.0%

(1) Based on both Summer and Winter Programs, the estimated overall combustible waste fraction is 84% of the total Waste Type 10. The percentages have been corrected to compensate for the fact that some recyclables were source separated prior to sorting at the landfills.

2) County designated recyclable

TABLE 6-2
WASTE TYPE 10 QUANTITIES OF DESIGNATED RECYCLABLES

Municipality	Proposed Recycling Center (1)	Estimated 1987 Waste Type 10 Tons Generated (2)	Estimated Available Newspaper Tons (13.1%)	Estimated Available Aluminum Tons (1.3%)	Estimated Available Glass Tons (10.1%)	Estimated Available Ferrous Tons (4.1%)	Estimated Available Total Recyclable Tons 100% Capture
Barnegat Twp.	South	8,081	1,059	105	816	331	2,311
Barnegat Light	South	2,213	290	29	224	91	633
Bay Head Boro	North	2,132	279	28	215	87	610
Beach Haven	South	4,321	566	56	436	177	1,236
Beachwood Boro	North	6,989	916	91	706	287	1,999
Berkeley Twp.	Both	27,463	3,598	357	2,774	1,126	7,854
Brick Twp.	North	46,831	6,135	609	4,730	1,920	13,394
Dover Twp.	North	102,397	13,414	1,331	10,342	4,198	29,285
Eagleswood Twp.	South	1,692	222	22	171	69	484
Harvey Cedars	South	1,813	237	24	183	74	518
Island Heights	North	1,554	204	20	157	64	445
Jackson Twp.	North	17,645	2,312	229	1,782	723	5,046
Lacey Twp.	South	18,208	2,385	237	1,839	747	5,208
Lakehurst Twp.	North	2,888	378	38	292	118	826
Lakewood Boro	North	26,799	3,511	348	2,707	1,099	7,664
Lavellette Boro	North	3,464	454	45	350	142	991
Little Egg Harbor	South	10,695	1,401	139	1,080	438	3,059
Long Beach Twp.	South	14,683	1,923	191	1,483	602	4,199
Manchester Twp	North	15,581	2,041	203	1,574	639	4,456
Mantoloking Boro	North	588	90	9	69	28	197
Ocean Twp.	South	5,564	729	72	562	228	1,591
Ocean Gate Boro	North	1,660	217	22	168	68	475
Pine Beach Boro	North	2,381	312	31	240	98	581
Plumsted Twp.	North	2,915	382	38	294	120	834
Point Pleasant Boro	North	17,996	2,357	234	1,818	738	5,147
Point Pleasant Beach	North	5,731	751	74	579	235	1,639
Seaside Heights Boro	North	5,326	698	69	538	218	1,523
Seaside Park Boro	North	2,910	381	38	294	119	832
Ship Bottom Boro	South	2,994	392	39	302	123	856
South Toms River	North	4,480	587	58	452	184	1,291
Stafford Twp.	South	19,368	2,537	252	1,956	794	5,539
Surf City Boro	South	3,655	479	48	369	150	1,045
Tuckerton Boro	South	4,949	648	64	500	203	1,115
TOTALS		396,054	51,884	5,149	40,002	16,239	113,274

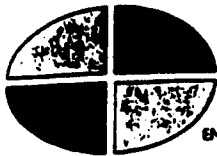
NOTES:

(1) North Recycling Center in Lakewood; South Recycling Center in Stafford.

(2) Total tons equals NJDEP 1987 adjusted Waste Type 10 figures converted with weigh program densities with projected 1987 recycling quantities added. Recycling numbers only include newspaper, corrugated, aluminum, ferrous, and glass.

APPENDIX A

**Laboratory Analysis
Data Sheets**



SSM

SPOTTS, STEVENS and McCOY, INC.
ENGINEERS • PLANNERS • SCIENTISTS

CERTIFICATE OF ANALYSIS

CLIENT: Elson T. Killam Associates, Inc.
P. O. Box 1008
Millburn NJ 07041

DATE REPORTED: 10/16/87
REPORT NO: 8710632-001
DATE SAMPLED:
DATE RECEIVED: 09/01/87
PURCHASE NO.:
ORDER NO.:

: Newspaper Composite (9)

		AS RECEIVED	DRY BASIS
Total Moisture	%	14.3	
Volatile Matter	%	75.1	87.6
Fixed Carbon	%	9.77	11.4
Ash	%	0.86	1.00
Heating Value	Btu/lb	7276	8490
Sulfur	%	0.23	0.27
Carbon	%	42.3	49.4
Hydrogen (Excluding H in moisture)	%	5.32	6.21
Hydrogen (Including H in moisture)	%	6.91	
Nitrogen	%	0.10	0.12
Chlorine	%	0.02	0.02
Oxygen (Excluding O in moisture)	%	36.8	43.0
Oxygen (Including O in moisture)	%	49.5	

1305 LARGE

Form No. L11a Rev. 1/87

REPLY TO:

HOME OFFICE
345 N. Wyomissing Blvd.
P.O. Box 6307
Reading PA 19610-0307

INDUSTRIAL
HYGIENE LABORATORY
345 N. Wyomissing Blvd.
P.O. Box 6307

CHEMISTRY
LABORATORY
30 Noble Street
P.O. Box 6527

LEHIGH VALLEY OFFICE
MacArthur Office Plaza Suite 401
3722 Lehigh Street
Whitehall PA 18052-3438

BALTIMORE OFFICE
698 Fairmount Ave.
Suite 105
Towson MD 21204



Elston T. Killam Associates Inc.
Gary K. Walker

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October 16, 1987
Report No. 8710632-002

Wood Composite (2)

		AS RECEIVED	DRY BASIS
Total Moisture	%	20.59	
Volatile Matter	%	67.0	84.4
Fixed Carbon	%	10.4	13.1
Ash	%	1.96	2.47
Heating Value	Btu/lb	6654	8380
Sulfur	%	0.19	0.24
Carbon	%	38.5	48.5
Hydrogen (Excluding H in moisture)	%	4.87	6.14
Hydrogen (Including H in moisture)	%	7.16	
Nitrogen	%	0.15	0.20
Chlorine	%	0.03	0.04
Oxygen (Excluding O in moisture)	%	33.7	42.4
Oxygen (Including O in moisture)	%	52.0	

Plastic Film Composite (9) Report No. 8710632-003

		AS RECEIVED	DRY BASIS
Total Moisture	%	11.80	
Volatile Matter	%	88.3	100.1
Fixed Carbon	%	--	--
Ash	%	0.17	0.19
Heating Value	Btu/lb	16582	18800
Sulfur	%	0.03	0.04
Carbon	%	72.9	82.7
Hydrogen (Excluding H in moisture)	%	12.6	14.3
Hydrogen (Including H in moisture)	%	13.9	
Nitrogen	%	0.01	0.01
Chlorine	%	1.92	2.18
Oxygen (Excluding O in moisture)	%	0.51	0.58
Oxygen (Including O in moisture)	%	11.0	



Elston T. Killam Associates Inc.
Gary K. Walker

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October 16, 1987
Report No. 8710632-004

Rigiel Film Composite (9)

		AS RECEIVED	DRY BASIS
Total Moisture	%	4.10	
Volatile Matter	%	94.9	99.0
Fixed Carbon	%	0.47	0.49
Ash	%	0.43	0.45
Heating Value	Btu/lb	17032	17760
Sulfur	%	0.10	0.11
Carbon	%	78.1	81.4
Hydrogen (Excluding H in moisture)	%	12.0	12.5
Hydrogen (Including H in moisture)	%	12.4	
Nitrogen	%	< 0.01	0.01
Chlorine	%	5.23	5.49
Oxygen (Excluding O in moisture)	%	0.04	0.04
Oxygen (Including O in moisture)	%	3.68	

Textile Composite (8) Report No. 8710632-005

		AS RECEIVED	DRY BASIS
Total Moisture	%	6.05	
Volatile Matter	%	79.6	84.7
Fixed Carbon	%	13.3	14.2
Ash	%	1.03	1.10
Heating Value	Btu/lb	9127	9710
Sulfur	%	0.55	0.59
Carbon	%	52.4	55.7
Hydrogen (Excluding H in moisture)	%	5.09	5.42
Hydrogen (Including H in moisture)	%	5.76	
Nitrogen	%	2.21	2.35
Chlorine	%	1.37	1.46
Oxygen (Excluding O in moisture)	%	31.4	33.4
Oxygen (Including O in moisture)	%	36.8	



Elston T. Killam Associates Inc. -4-
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October 16, 1987
 Report No. 8710632-006

Corrugated Composite (5)

		AS RECEIVED	DRY BASIS
Total Moisture	%	9.00	
Volatile Matter	%	77.9	85.6
Fixed Carbon	%	10.2	11.2
Ash	%	2.87	3.15
Heating Value	Btu/lb	7162	7870
Sulfur	%	0.17	0.19
Carbon	%	41.7	45.8
Hydrogen (Excluding H in moisture)	%	5.47	6.01
Hydrogen (Including H in moisture)	%	6.47	
Nitrogen	%	0.14	0.15
Chlorine	%	0.06	0.07
Oxygen (Excluding O in moisture)	%	40.6	44.6
Oxygen (Including O in moisture)	%	48.6	

Other Paper Composite (9) Report No. 8710632-007

		AS RECEIVED	DRY BASIS
Total Moisture	%	20.55	
Volatile Matter	%	66.9	84.3
Fixed Carbon	%	7.54	9.50
Ash	%	4.90	6.17
Heating Value	Btu/lb	5955	7500
Sulfur	%	0.17	0.22
Carbon	%	33.9	42.7
Hydrogen (Excluding H in moisture)	%	4.88	6.15
Hydrogen (Including H in moisture)	%	7.16	
Nitrogen	%	0.35	0.44
Chlorine	%	0.14	0.18
Oxygen (Excluding O in moisture)	%	35.0	44.1
Oxygen (Including O in moisture)	%	53.3	



Elston T. Killam Associates Inc.
Gary K. Walker

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October 16, 1987
Report No. 8710632-008

Food Waste Composite (9)

		AS RECEIVED	DRY BASIS
Total Moisture	%	72.51	
Volatile Matter	%	21.2	77.0
Fixed Carbon	%	3.79	13.8
Ash	%	2.53	9.20
Heating Value	Btu/lb	2329	8470
Sulfur	%	0.07	0.25
Carbon	%	12.3	44.6
Hydrogen (Excluding H in moisture)	%	1.66	6.04
Hydrogen (Including H in moisture)	%	9.72	
Nitrogen	%	0.80	2.91
Chlorine	%	0.24	0.88
Oxygen (Excluding O in moisture)	%	9.93	36.1
Oxygen (Including O in moisture)	%	74.4	

Sweepings Composite (9) Report No. 8710632-009

		AS RECEIVED	DRY BASIS
Total Moisture	%	37.90	
Volatile Matter	%	31.3	50.4
Fixed Carbon	%	8.20	13.2
Ash	%	22.6	36.4
Heating Value	Btu/lb	3769	6070
Sulfur	%	0.10	0.17
Carbon	%	16.9	27.2
Hydrogen (Excluding H in moisture)	%	2.12	3.41
Hydrogen (Including H in moisture)	%	6.33	
Nitrogen	%	0.59	0.95
Chlorine	%	0.40	0.64
Oxygen (Excluding O in moisture)	%	19.4	31.2
Oxygen (Including O in moisture)	%	53.1	



Elston T. Killam Associates Inc.
Gary K. Walker

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October 16, 1987
Report No. 8710632-010

Yard Waste Composite (8)

		AS RECEIVED	DRY BASIS
Total Moisture	%	53.6	
Volatile Matter	%	31.4	67.6
Fixed Carbon	%	6.96	15.0
Ash	%	8.07	17.4
Heating Value	Btu/lb	3359	7240
Sulfur	%	0.08	0.18
Carbon	%	18.9	40.8
Hydrogen (Excluding H in moisture)	%	2.18	4.70
Hydrogen (Including H in moisture)	%	8.13	
Nitrogen	%	0.74	1.59
Chlorine	%	0.12	0.27
Oxygen (Excluding O in moisture)	%	16.3	35.1
Oxygen (Including O in moisture)	%	63.9	

Respectfully submitted,

R. M. LARGE, Program Supervisor
Chemistry Laboratory

PRN

cc: Gary K. Walker

Ocean County Leaf Composting
Regionalization of Municipal Facilities
Service Area

BEACHWOOD FACILITY - This facility is located in the southeast corner of Beachwood Borough, just north of Hickory Street. The block and lot designation is Block H-9, 64 and 63; Lots 1 to 60 and 1 to 30.

<u>Beachwood Leaf Composting Facility</u>	<u>Estimate of municipal generation rate of leaves</u>
Beachwood.....	4,000 cu. yds.
Pine Beach.....	1,000 cu. yds.
Ocean Gate.....	<u>1,000 cu. yds.</u>
Total.....	6,000 cu. yds.

DOVER FACILITY - This facility is located directly adjacent to the Garden State Parkway in the northeastern area of Dover Township. The facility site is adjacent to the Dover Public Works Complex and the terminated Dover Township Municipal Landfill; and is surrounded by Bay Avenue, Church Road and Silverton Road. The block and lot designation is Block 231; Lots 10 and 7.

<u>Dover Leaf Composting Facility</u>	<u>Estimate of municipal generation rate of leaves</u>
Dover.....	8,000 cu. yds.
Ocean County Bldgs. & Grounds.....	500 cu. yds.
Lavallette.....	100 cu. yds.
Seaside Park.....	100 cu. yds.
Seaside Heights.....	<u>100 cu. yds.</u>
Total.....	8,800 cu. yds.

JACKSON FACILITY - This facility is located in the southern portion of a 94 acre municipal recreation area in the central area of Jackson Township. the facility is located off of Bennetts Mills-Holmansville Road (Butterfly Road). The block and lot designation is Block 80; Lot 802.

<u>Jackson Leaf Composting Facility</u>	<u>Estimate of municipal generation rate of leaves</u>
Jackson.....	12,000 cu. yds.
Plumsted.....	1,000 cu. yds.
Lakehurst.....	<u>750 cu. yds.</u>
Total.....	13,750 cu. yds.

LAKWOOD FACILITY - This facility is in the eastern area of Lakewood Township, just east of New Hampshire Avenue, south of Pine Street. The facility is located at the "Old" Lakewood Municipal Landfill. The block and lot designation is Block 1160.06; Lot 241.

<u>Lakewood Leaf Composting Facility</u>	<u>Estimate of municipal generation rate of leaves</u>
Lakewood.....	15,000 cu. yds.
Dover.....	3,000 cu. yds.
Ocean County Parks.....	1,000 cu. yds.
Point Pleasant.....	6,000 cu. yds.
Point Pleasant Beach.....	750 cu. yds.
Bay Head.....	200 cu. yds.
Mantoloking.....	100 cu. yds.
Island Heights.....	1,000 cu. yds.
Brick.....	<u>10,000 cu. yds.</u>
Total.....	37,050 cu. yds.

STAFFORD FACILITY - This facility is located west of the Garden State Parkway just south of Hay Road in Stafford Township. The facility is adjacent to the terminated Stafford Township Municipal Landfill. The block and lot designation is Block 25; Lots 13, 14 and 15.

<u>Stafford Leaf Composting Facility</u>	<u>Estimate of municipal generation rate of leaves</u>
Stafford.....	4,000 cu. yds.
Long Beach Island.....	2,000 cu. yds.
(Barnegat Light, Harvey Cedars, Long Beach Township, Ship Bottom, Surf City, Beach Haven)	
Eagleswood.....	500 cu. yds.
Little Egg Harbor.....	1,500 cu. yds.
Barnegat.....	1,500 cu. yds.
Ocean.....	1,500 cu. yds.
Tuckerton.....	750 cu. yds.
Berkeley.....	10,000 cu. yds.
South Toms River.....	<u>1,000 cu. yds.</u>
Total.....	22,750 cu. yds.