November 16, 1979

REF: 4AH-RM

RECEIVED
NOV 21 1979
SOLID WASTE-VECTOR CONTROL

Mr. Ellen C. Willlams, Chairman
New Hanover County Commissioners
320 Chestnut Street
Wilmington, North Carolina 28401

Dear Mr. Williams:

Thank you for your letter of November 9, 1979, requesting technical assistance through the Resource Recovery and Conservation Panels Program of the U. S. Environmental Protection Agency.

Your request is under review and we will be contacting you in January or February, 1980, to arrange a visit.

We have enclosed a pamphlet explaining the Technical Assistance Program for your information.

If further assistance is desired, please contact me.

Sincerely yours,

Elmer G. Cleveland
Project Officer

bcc: W. Strickland

4AH-RM:ECLEVELAND:sm:3016:11/16/79

New Hanover
AWTUC

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

HUGH H. TILSON, M.D.
DIRECTOR

EASTERN REGIONAL OFFICE
404 ST. ANDREWS STREET
GREENVILLE, N.C. 27834
Telephone 756-1343

RECEIVED
SEP 19 1979
SOLID WASTE SECTION CONTROL

September 18, 1979

Mr. Robert F. Coleman, Jr.
Director of Public Works
P. O. Box 1810
102 N. Third Street
Wilmington, NC 28401

Dear Mr. Coleman:

I am writing you regarding the bar screen waste from your waste water treatment systems.

Mr. Frank Olive, Sanitarian Supervisor with the New Hanover County Health Department, told me he received several complaints from people concerning odors from this waste. Apparently some of your solid waste packer trucks were leaking along their collection routes.

I contacted Mr. Austin Little on September 13, 1979. We visited your plant near the airport. Mr. Little told me he hauled approximately 15 cubic yards per week from your two plants and pumping stations.

While this bar screen material is similar to waste commonly disposed of in sanitary landfills, it does contain raw sewage which is not allowable under our present rules. This will cause you to make other arrangements for disposal. Perhaps you may have a suitable site on your present property for burial.

I realize this will complicate your present operation but I had to make you aware of this problem.

If I can be of any assistance, please let me know.

Sincerely,

Fred Wood

Fred J. Wood
Solid Waste Branch
Sanitary Engineering Section

/ae

cc: Frank Olive
O. W. Strickland

To Jew Hoover
AW + VC

August 9, 1979

Mr. A. C. Palmer
Vice President
Northeast Chemical Company
Post Office Box 756
Highway 421 North
Wilmington, North Carolina 28402

Dear Mr. Palmer:

This office has no objection to your company transporting aluminum oxide into the State of North Carolina for recovery. If there is a waste left over from the recovery method, it must be properly managed.

Sincerely,

O. W. Strickland, Acting Head
Solid & Hazardous Waste Management Program
Sanitary Engineering Section

OWS:bm
cc: Mr. Fred J. Wood

NORTHEAST CHEMICAL COMPANY
P. O. BOX 756 • HIWAY 421 NORTH
WILMINGTON, NORTH CAROLINA 28402

PHONES 919-762-5054
919-762-4175

August 2, 1979

RECEIVED
AUG 6 1979
SOLID WASTE-VECTOR CONTROL

Mr. O. W. Strickland
Department of Human Resources
P. O. Box 2091
Raleigh, N. C. 27602

Dear Mr. Strickland:

Mr. Bill Cochran of the North Carolina Department of Natural Resources and Community Development suggested I write you regarding a letter of approvement to transport waste aluminum oxide into the State of North Carolina from South Carolina. This is one of the requirements of the owners of this by-product. Listed below are the questions you requested.

(1) Where the material is located.
  (A) Mepco Electric Corp.
      6071 St. Andrews Rd.
      Columbia, S. C. 29210

(2) Composition of material.
  (A) 42% $A/_2O_3$
  (B) 50% H_2O
  (C) 8% NACL

(3) Plans for disposition of material.
  (A) Wash and remove the NACL and market this product as a sodium chloride solution.
  (B) Balance of material will be reacted with sulphuric acid to produce liquid aluminum sulphate.

(4) Tons per day.
  (A) Approximately 50 tons per week.

If this meets with your approval, a letter from your department stating same would be greatly appreciated.

Very truly yours,

NORTHEAST CHEMICAL CO.

A. C. Palmer
Vice President

STATE OF NORTH CAROLINA

OFFICE OF THE GOVERNOR

RALEIGH 27611

JAMES B. HUNT, JR.
GOVERNOR

July 17, 1979

RECEIVED
JUL 19 1979
SOLID WASTE-VECTOR CONTROL

Mr. Bill Strickland, Acting Head
Solid and Hazardous Waste Management Program
Department of Human Resources
Bath Building
Raleigh, North Carolina

Dear Bill:

Good to talk to you about Mr. Rogers' concerns. He will appreciate your call. The thought occurred to me that if he were assured his feelings would be officially entered into the decision process...just as in the public hearings... perhaps it will be adequate to deal with it.

Are congratulations in order to you for your new assignment? If so, congrats!

Sincerely,

Floyd A. Craig
Deputy Director
Governor's Office of Citizen Affairs

FAC:jf

Enc.

Hanover
Gwvc

STATE OF NORTH CAROLINA

OFFICE OF THE GOVERNOR

RALEIGH 27611

JAMES B. HUNT, JR.
GOVERNOR

July 17, 1979

Mr. Marion Rogers
5041 Heidi Drive
Wilmington, North Carolina 28403

Dear Mr. Rogers:

This is in reference to your telephone call to this office on July 3 expressing your concern regarding the need for New Hanover County to be a site for a public hearing on hazardous material disposal.

This office contacted Ms. Jane Sharp with the Department of Administration, Division of Policy Development, and I understand that she discussed this situation with you at length. After several discussions with Ms. Sharp in which the present circumstances involved in New Hanover County were thoroughly examined, our office contacted the Solid Waste and Vector Control offices within the Department of Human Resources. Mr. Bill Strickland is this division's director. Mr. Strickland will be in touch with you to secure your views first hand. I have talked with him personally and shared with him the concerns you and others have. I believe Mr. Strickland will give you and others in New Hanover County an opportunity to officially express your feelings.

I know there was no intention to avoid any area in the state by not holding public hearings in Wilmington. One factor I am sure figured into the decision was that all departments have been encouraged to cut back on their travel. Be that as it may, your concerns are important and need to be heard.

We will stay in touch with Mr. Strickland as we both try to work through ways these concerns can be addressed.

Sincerely,

Floyd A. Craig
Deputy Director
Governor's Office of Citizen Affairs

FAC:jf

cc: Mr. Bill Strickland

DEPARTMENT OF HUMAN RESOURCES ___RUSH

TO Perkins

DATE 7/12 TIME 10:36

WHILE YOU WERE OUT

M Floyd Craig

OF Governor's office

PHONE 733-5927

✓ TELEPHONED ✓ PLEASE PHONE

___ WANTS TO SEE YOU ___ WILL CALL AGAIN

___ CAME TO SEE YOU ___ RETURNED YOUR CALL

MESSAGE

DHR 0011 (Rev. 7-77) BY

STATE OF NORTH CAROLINA

OFFICE OF THE GOVERNOR

RALEIGH 27611

JAMES B. HUNT, JR.
GOVERNOR

7/9/79

JERRY —

Thank You for looking over These —

Perhaps — after You study it all we can share with Them That some ways of hearing Them has or will be planned. We will Try to get back with Them as soon as possible.

Thank You
JOHN C

_____ Closed

GOVERNOR'S OMBUDSMAN INFORMATION SHEET

CASE NUMBER	INITIATION DATE	NAME & ADDRESS
099265	070379	Marion Rogers 504 Heidi Dr. Wilmington, N.C. 28403
DEPARTMENT	OFFICE	
~~ARCD~~ DHR	Health Services	
05	070	
COMPLAINT ☒	REQUEST ☐	BUSINESS / TELEPHONE / HOME: 791-3486
JURISDICTION ☒	NO JURISDICTION ☐	
WRITTEN 1 ☐	PHONE 2 ☒	VISIT 3 ☐

TAKEN BY: ~~Jayne Felton~~

REFERRED TO: _____

PLEASE RESPOND BY: _____

SUBSTANCE OF INQUIRY OR COMPLAINT:

Mr. Marion Rogers was most upset that the scheduled 3 hearings on hazardous materials disposal sites did not include a meeting in the area of New Hanover County, as well as one in the Winston-Salem area.

Feels that as these two locales are definitely indistrial and have the need for meetings of this sort to discuss potential problems, that meetings should be scheduled to include these municipalities.

Called Jane Sharp

Called Dayne Brown's Office

Called Jerry Perkins (2178)

In order to assist this office in expediting an answer to the above citizen, please complete the action indicated below:

- ☐ Investigate and Acknowledge Stating Governor Referred Inquiry to You. Send Copy to this Office.
- ☐ Draft Reply Suitable for Governor's Signature.
- ☐ Investigate and Furnish this Office with Necessary Information to Respond to Inquiry.
- ☐ For Your Information.

Thank You for Your Cooperation and Assistance.

Please Return To:

Governor's Ombudsman Office
Administration Building
116 W. Jones Street., Raleigh

COMMENTS AND RECOMMENDATIONS

COUNTY 065

North Carolina
Department of Administration
116 West Jones Street Raleigh 27603

James B. Hunt, Jr., Governor
Joseph W. Grimsley, Secretary

Arnold Zogry
Assistant Secretary for Policy and Management
(919) 733-4131

July 7, 1979

MEMORANDUM: RE SOLID WASTE AND HAZARDOUS WASTE MEETING REQUEST IN WILMINGTON AREA AND AT WINSTON-SALEM

TO: CITIZEN AFFAIRS OFFICE - Jayne Felton

FROM: JANE SHARP Jane Sharp - have material on setting up engineering plans for chapel Hill & will be glad to help.

"Butch" (Marion) Rogers of 5041 Heide Drive, Wilmington, NC 28403, (919) 791-3486 (O) and 675-9168 or 675-9207 (H) has requested that the State hold"public information and comment"hearings on the guidelines set by the North Carolina Solid Waste Branch of the Health Services Division of Human Resources Department, under HB 290, and also the proposed federal regulations for hazardous waste facilities.

He notes that such hearings held in late June and early July at Charlotte, Asheville, Raleigh did not include either Wilmington or Winston-Salem, though both cities are having numerous solid and hazardous problems.

The particular problem at the moment in Wilmington is that the city landfill is beginning to leak hazardous materials in an area inhabited mostly by poor people, and EPA has shut it down. (Toluene, and other things-)

The County Health Department and Public Works Division are looking for another similar site in the County, but Butch knows that the high water table in New Hanover County will make <u>any</u> site hazardous in a short time, and he wants the State to urge recycling of all possible paper, glass, aluminum and other metals to reduce the volume enough to make trucking the rest to a safe site economically feasible.

Mr. Rogers and his father could name 50 people in the area who are frustrated and angry that <u>some</u> level of government has not yet taken responsibility for an increasingly serious problem. One well is 150 to 200 times the allowed standard for pollutants (toluene?), and others are unsafe also.

Landfill operators, leasors, and the County are being sued by EPA, and the problem is beyond local capacity. They really need help. Can we <u>do</u> soemthing? (Recycling really is possible, reasonable and workable.)

_____ Closed

GOVERNOR'S OMBUDSMAN INFORMATION SHEET

CASE NUMBER	INITIATION DATE	NAME & ADDRESS
099359	07 09 79	Dave Levy 1428 Sedwick Rd. Durham, N.C. 27713
DEPARTMENT	OFFICE	
DHR	Health Services	
05	070	

BUSINESS TELEPHONE HOME

COMPLAINT [X] REQUEST [ ]

JURISDICTION [X] NO JURISDICTION [ ]

WRITTEN 1 [ ] PHONE 2 [ ] VISIT 3 [X]

TAKEN BY: Jayne Fulton

REFERRED TO: Jerry Perkins

PLEASE RESPOND BY:

SUBSTANCE OF INQUIRY OR COMPLAINT:

Wilmington
Greensboro
Charlotte

Mr. Levy and group of supporters are interested in seeing that hearings on hazardous materials disposal sites be conducted in the vicinity of the above cities, as they are industrial and the citizens are becoming more aware of the problem of waste disposal. These people feel this should be a priority of DHR as it potentially poses health hazards to these densely populated areas.

In order to assist this office in expediting an answer to the above citizen, please complete the action indicated below:

[ ] Investigate and Acknowledge Stating Governor Referred Inquiry to You. Send Copy to this Office.

[ ] Draft Reply Suitable for Governor's Signature.

[X] Investigate and Furnish this Office with Necessary Information to Respond to Inquiry.

[ ] For Your Information.

Thank You for Your Cooperation and Assistance.

Please Return To:

Governor's Ombudsman Office
Administration Building
116 W. Jones Street., Raleigh

COMMENTS AND RECOMMENDATIONS

COUNTY 032

New Hanover
Owen

June 28, 1979

Mr. Harvey Stuart
State of North Carolina
Department of Justice
Raleigh, NC 27602

Dear Mr. Stuart,

In reference to your letter of June 15, 1979 concerning a hazardous waste shipment from New Jersey to North Carolina, I have secured the following information.

The North East Chemical Company, Highway 421, Wilmington, North Carolina was the receiver of the waste. Their company informed this office that the waste becomes a resource for use in a product they produce and is not in any way disposed of in North Carolina.

Sincerely,

O.W. Strickland, Acting Head
Solid & Hazardous Waste Management
Program
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS:jk

NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

INTER OFFICE MEMORANDUM

DATE June 18, 1979

TO Mr. O. W. Strickland

FROM Jerry C. Perkins

The attached material needs prompt follow up. Mr. Page Benton may have supplemental information regarding the facilities of North East Chemical Company in Wilmington. In reply, please make reference to the attached June 15 memorandum.

DHR Form 2 (8/75)

COPY

State of North Carolina
Department of Justice
RALEIGH

June 15, 1979

RECEIVED
JUN 18 1979

MEMO

TO: Page Benton
Jerry Perkins

FROM: Harvey Stuart

RE: Hazardous Waste Shipments

Attached you will find a letter and attachments from the New Jersey Department of Environmental Protection requesting information concerning a number of shipments of presumably hazardous wastes to North Carolina.

Apparently, New Jersey can bring enforcement actions against the shippers if the wastes are not properly disposed of upon arrival in North Carolina. I would appreciate any information which you could supply concerning the confirmation of the proper disposal of these shipments by the indicated receiving facilities.

/ck

Attachments

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION
TRENTON, 08625

BEATRICE S. TYLUTKI
DIRECTOR

NORTH CAROLINA
ATTORNEY GENERAL'S OFFICE
JUN 14 1979
ENVIRONMENTAL PROTECTION SECTION
RECEIVED

June 4, 1979

W. A. Raney Jr.
Special Deputy Attorney General
P.O. Box 629
Raleigh, NC 27602

Dear Mr. Raney:

Attached are copies of manifests which were sent to your state. If this material was disposed of illegally or the facility indicated is not an approved hazardous waste site, please contact me and we will take the neccessary action.

If you have any questions, please contact me at (609) 292-7645.

Sincerely

Eric Craig

Eric Craig, Chief
Bureau of Technical Services

EC/ts

New Jersey Is An Equal Opportunity Employer

SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST

C 85499

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 8 5 0 1 3 Pick-Up Date 5 / 3 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CHEMICAL LEAMAN TANK LINES Address NAZARETH, PA.

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

Handling Instructions:
(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	1	L	C	3,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB,PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 5/3/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

PA CM 11573 (State Number)

I certify that the described quantity of material(s) listed in Section I was collected by me.
Date ____ Signature ____ Vehicle License Plate Number ____

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler ____ Address ____

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date ____ Signature ____ Vehicle License Plate Number ____

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility ____ Address ____

Registration Number ____ Date Waste Received ____ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date ____ Signature and Title ____

D — ADMINISTRATION COPY

SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST

C 85498

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 8 5 0 1 3 Pick-Up Date 5 / 3 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CHEMICAL LEAMAN TANK LINES Address NAZARETH, PA.

Name of Facility NORTH EAST CHEMICAL CO. Address ~~XXXXXXXXXXXXXXXX~~HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:

Emergency Spill Phone Nos.: 609-292-5360 or 609-292-7172

(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	I	L	C	3,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB, PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.

Date 5/3/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

PA TH 11479 (State Number)

I certify that the described quantity of material (s) listed in Section I was collected by me.

Date [illegible] Signature [illegible] Vehicle License Plate Number [illegible]

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date _____ Signature _____ Vehicle License Plate Number

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____

Registration Number _____ Date Waste Received _____ / _____ / _____ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

2/78

D

SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST

C 85632

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 3 5 0 1 3 Pick-Up Date 5 / 3 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPENO ROAD GREAT MEADOWS, N.J.

Name of Hauler CONRAIL-LF & B - NCL Address P.O. DRAW F. WARWICK, N.Y. 10990

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

Handling Instructions:

(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	1	L	C	10,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB,PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.

Date 5/3/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.

Date _____ Signature _____ Vehicle License Plate Number State ☐☐ Number ☐☐☐☐☐☐☐

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date _____ Signature _____ Vehicle License Plate Number ☐☐ ☐☐☐☐☐☐☐

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____

Registration Number ☐☐☐☐☐ Date Waste Received ☐☐/☐☐/☐☐ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

D — ADMINISTRATION COPY

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST

C 85490

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 8 5 0 1 3 Pick-Up Date 4 / 3 0 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CONRAIL Address P.O. BOX DRAW F. WARICK, N.Y. 10990

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	I	L	C	~~APPROX~~ 10,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacrimators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB, PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 4/30/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.
Date _____ Signature _____ Vehicle License Plate Number N.Y. (State) 2465 TS (Number)

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____
I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I
Date _____ Signature _____ Vehicle License Plate Number

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____
Registration Number _____ Date Waste Received ___/___/___ ☐ Accepted ☐ Rejected
I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

2/78

D

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST C 35636

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 0 3 0 1 3 Pick-Up Date 0 2 / 0 9 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CHEMICAL LEAMAN TANK LINES Address NAZARETH, PA.

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:
(1) CORROSIVE MATERIAL

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity Identify units in pounds or gallons use P for pounds and G for gallons	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR Rejected Amount
1.	Acid Solution	1	L	C	3,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB,PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 5/9/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.
Date [illegible] Signature [illegible] Vehicle License Plate Number State PA Number CM 11370

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date _____ Signature _____ Vehicle License Plate Number _____

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____

Registration Number _____ Date Waste Received ___/___/___ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

D — ADMINISTRATION COPY

2/78

SOLID WASTE ADMINISTRATION

D

SPECIAL WASTE MANIFEST

C 35634

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 5 5 0 1 5 Pick-Up Date 5 / 9 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CHEMICAL LEAMAN TANK LINES Address NAZARETH, PA.

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	1	L	C	3,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB,PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.

Date 5/9/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.

Date [illegible] Signature [illegible] Vehicle License Plate Number [illegible] State PA Number 170

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler [illegible] Address

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date [illegible] Signature [illegible] Vehicle License Plate Number [illegible]

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility Address

Registration Number Date Waste Received / / ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date Signature and Title

D — ADMINISTRATION COPY

Form VHW-001
2/78

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION

D

SPECIAL WASTE MANIFEST

C 35495

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 3 5 0 1 3 Pick-Up Date 5 / 2 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CHEMICAL LEAMAN TANK LINES Address NAZARETH, PA.

Name of Facility NORTH EAST CHEMICAL CO. Address HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:
(I) CORROSIVE MATERIAL

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	1	L	C	3,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB, PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 5/2/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.
Date 5/2/79 Signature [illegible] Vehicle License Plate Number State PA Number CM 11370

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date _____ Signature _____ Vehicle License Plate Number

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____

Registration Number _____ Date Waste Received _____ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

D — ADMINISTRATION COPY

2/78

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION

D

SPECIAL WASTE MANIFEST

C 85494

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number 8 5 0 1 3 Pick-Up Date 5 / 2 / 7 9 (MO. DAY YR.)

Company Name SOUTHLAND CHEMICAL CORP.

Pick-Up Address ALPHANO ROAD GREAT MEADOWS, N.J.

Name of Hauler CONRAIL

Address P.O. DRAW F WARWICK, N.Y. 10990

Name of Facility NORTH EAST CHEMICAL CO.

Address HIGHWAY 421 WILMINGTON, N.C.

Handling Instructions:

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

(I) CORROSIVE MATERIAL

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution	I	L	C	7,000	G	
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emulsions						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB.PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.							
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 5/2/79 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.
Date _____ Signature _____ Vehicle License Plate Number N.J. (State) TW 829X (Number)

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler _____ Address _____
I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I
Date _____ Signature _____ Vehicle License Plate Number

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility _____ Address _____
Registration Number _____ Date Waste Received ___/___/___ ☐ Accepted ☐ Rejected
I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

D — ADMINISTRATION COPY

New Hanover
Swvc

DIVISION OF ENVIRONMENTAL MANAGEMENT
ENVIRONMENTAL OPERATIONS SECTION

June 19, 1979

RECEIVED
JUN 20 1979
SOLID WASTE-VECTOR CONTROL

Mr. Richard F. Schmitt, Manager
Disposal Division
Consolidated Energy Products Company
P. O. Box 1215
1223 North 23rd Street
Wilmington NC 28402

Dear Mr. Schmitt:

This letter is in response to your letter dated June 6, 1979, concerning companies that utilize landfills to dispose of hazardous substances. This Division does not regulate landfill disposal operations. However, the Division of Health Services does carry out a landfill regulatory program. Therefore, I am by copy of this letter referring this matter to Mr. Jerry Perkins of the Division of Health Services, Solid Waste and Vector Control Branch, for an appropriate response.

If I may assist you in other matters, do not hesitate to contact me.

Sincerely,

H. Vance Holt

H. Vance Holt, Acting Coordinator
Enforcement & Emergency Response

cc: Jerry Perkins

HVH:mnf

CONSOLIDATED ENERGY PRODUCTS COMPANY
P. O. BOX 1215, 1223 NORTH 23RD STREET, WILMINGTON, NORTH CAROLINA 28402
A/C 919 763-3392 or 919 763-5483

A DIVISION OF CONDEC CORPORATION

RECEIVED
JUN 12 1979
Div. of Environmental Mgt.
Raleigh, N. C.

6 June, 1979

Mr. A. F. McRorie
Director
Division of Environmental Management
Post Office Box 27687
Raleigh, North Carolina

Dear Mr. McRorie :

Here I am, once again, asking for your help. During October, 1978, you very kindly answered my question concerning recycling of both liquid and solid wastes. I am now in the process of collecting information on other topics. Perhaps you may be able to help me once again.

My questions are as follows:

1. What specific companies, either in-state or out-of-state, bury chemical or toxic wastes?
2. Where do they bury them?
3. What type(s) of container(s) is/are used for transportation and/or burial?
4. What specific companies, either in-state or out-of-state, bury other types of waste, such as radioactive?
5. Where do they bury them?
6. What type(s) of container(s) is/are used for transportation and/or burial?

Mr. McRorie, if you are unable to answer the above, would you please either relate the names, addresses, phone numbers, etc. of those who could, or pass my letter along to them.

Let me thank you, in advance, for your assistance. May I expect a prompt reply?

Sincerely,

Richard F. Schmitt

Richard F. Schmitt
Manager, Disposal Division

RFS/lat

RECEIVED
JUN 13 1979
ENVIRONMENTAL OPERATIONS

Mr. Perkins

RECEIVED
MAY 29 1979
SANITARY ENGINEERING SECTION

May 24, 1979

Mrs. David H. Scott
Route 1, Box 611-C
Wilmington, NC 28405

Dear Mrs. Scott:

Thank you for your nice letter. I have made inquiry relating to our meeting concerning the New Hanover County Landfill. I have inquired with the Department of Human Resources concerning the status of the application for this landfill and would like to report to you the current situation.

AW NC

My discussion was with Mr. James Stamey who is Assistant Chief of the Sanitary Engineering Section. It is in this section that landfill approvals take place. The Section Chief is Mr. Marshall Staton. I was informed that the subject of groundwater protection was taken up through discussions between the Department of Human Resources and the Division of Environmental Management and that DHR received assurances from DEM that if certain precautions were taken the groundwater would be protected. My understanding is that the plans for the landfill which still have to be submitted prior to the permit being granted will incorporate the groundwater protection features. It will then be incumbent on the Department of Human Resources to insure that these protective measures are adequate.

If you would like to track the approval process, the best procedure would probably be to contact the Department of Human Resources through Mr. Marshall Staton to inquire about this situation. You can expect them to be very concerned about the quality of the drinking water in the Castle Hayne aquifer because they have the mission of protecting the quality of the drinking water in the State of North Carolina.

Please let me know if I can be of any additional help. With best regards,

Yours very truly,

Neil S. Grigg

NSG:dap:898

cc: Marshall Staton
A. F. McRorie

New Hanover
Co

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
P. O. Box 2091 Raleigh 27602

JACOB KOOMEN, M.D., M.P.H.
DIRECTOR

1877
One Hundred Years
of Public Health
in North Carolina
1977

March 13, 1978

MEMORANDUM

TO. Mr. O. W. Strickland, Supervisor
Solid Waste Management Unit

FROM: J. Gordon Layton, Environmental Engineer
Solid Waste & Vector Control Branch

Called Hugh Perry with the Town of Wrightsville Beach (919) 256-2245 on February 22, 1978.

He is checking on Air Quality approval of the two incinerators. Should forward information to us.

August 31, 1978

Mr. Mike Taylor
New Hanover County Engineering Dept.
County Administration Building
320 Chestnut Street
Room 608
Wilmington, North Carolina 28401

Dear Mr. Taylor:

I am very sorry that I have been so slow in replying to your letters of July 19 and August 23, 1978.

As you can note from the newspapers, we have been and are still very much involved in PCB cleanup which has taken top priority in the last few weeks.

I have discussed the proposed quarry operation with Mr. H. M. Peek, and I am enclosing a copy of his comments.

It is with regret that I must inform you that we cannot approve the proposed landfill site.

Please let us know if we can be of assistance.

Sincerely,

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS/wss

enclosure

cc: Mr. Fred J. Wood

NEW HANOVER COUNTY
ENGINEERING AND SERVICES

County Administration Building
320 Chestnut Street
Room 608
Wilmington, North Carolina 28401

Phone (919) ~~763-5170~~ ~~763-5177~~ 762-1831

Robert M. Williams, P.E.
County Engineer

RECEIVED
AUG 24 1978
SOLID WASTE-VECTOR CONTROL

August 23, 1978

Mr. O.W. Strickland
Environmental Engineer
N.C. Division of Health Services
P.O. Box 2091
Raleigh, North Carolina 27602

Dear Mr. Strickland:

The attached preliminary proposal was sent to your office for evaluation on July 19, 1978. Due to the present problems associated with the existing landfill area we are approaching the necessity to a possible new landfill site for New Hanover County.

Any information on this proposal as to the feasibility of the project would be appreciated and if this site should not meet Environmental Quality Standards, we can approach the problem to locate a landfill site for New Hanover County.

Thank You,

Mike Taylor

Mike Taylor
New Hanover County Engineering Department

MT/pw

NEW HANOVER COUNTY

ENGINEERING AND SERVICES

County Administration Building
320 Chestnut Street
Room 608
Wilmington, North Carolina 28401

Phone (919) ~~763-5130~~ 762-1831
~~(919) 763-5130~~

Robert M. Williams, P.E.
County Engineer

RECEIVED
AUG 24 1978
SOLID WASTE-VECTOR CONTROL

July 19, 1978

Mr. O. W. Strickland
Environmental Engineer
N. C. Division of Health Services
P. O. Box 2091
Raleigh, N. C. 27602

Dear Mr. Strickland:

As you know we have been considering the possibility of creating a new sanitary landfill site in the vicinity of and on property owned by the Ideal Cement Co. near Castle Hayne, N. C. We have felt from the beginning of our consideration that no useful purpose would be gained by discussing this possibility with the Company or, in fact, even disclosing this possibility to the Company at this time. Particularly in view of some of the adverse type publicity that has been prevalent with the Flemington site recently, we sincerely believe that any discussions of the possibility of locating to a new site should be extremely confidential until we at least determine that any proposed new site has an excellent chance of being approved by your office and the several other state agencies who will be involved in the ultimate approval of the site.

I have discussed on the telephone with Rick Shiver of the Water Quality Section here locally the general plan for the possible use of the Ideal Cement Company's site. He indicated to me that there may be a possibility of their approval depending, of course, upon many technical details of precisely how the operation would take place. In other words, he did not view the concept in a negative manner. He did suggest that we develop at least some sort of general plan and formally submit it so that your office and the other state offices would have the opportunity to formally comment on it.

Accordingly, we have prepared such a general plan and forward it herewith to you with the request that you view it in the light that it is submitted, that is, as a preliminary document. We shall appreciate your reviewing the concept and asking that the other state agencies involved in the approval process review it at this stage for the purpose of determining whether or not we should expend any further effort and funds in pursuing the matter.

While Mr. Eller and I both realize it is very difficult to evaluate any prospective plan of this nature without a physical inspection of the site, we both felt that this would likely be an inappropriate time to communicate directly with Ideal Cement Company. We would hope that your office could at least make a preliminary evaluation based upon the topographic information which we furnish herewith and hopefully the water quality section would have adequate information in their files as a result of other studies conducted in the area to make their preliminary evaluation.

We shall appreciate your reviewing this material and counseling with us as to any further action we might take at this stage.

Very truly yours,

Robert M. Williams, Jr.
New Hanover County Engineer

RMW/bm

Enclosures

RECEIVED
AUG 24 1978
SOLID WASTE-VECTOR CONTROL

NEW HANOVER COUNTY SANITARY LANDFILL

in

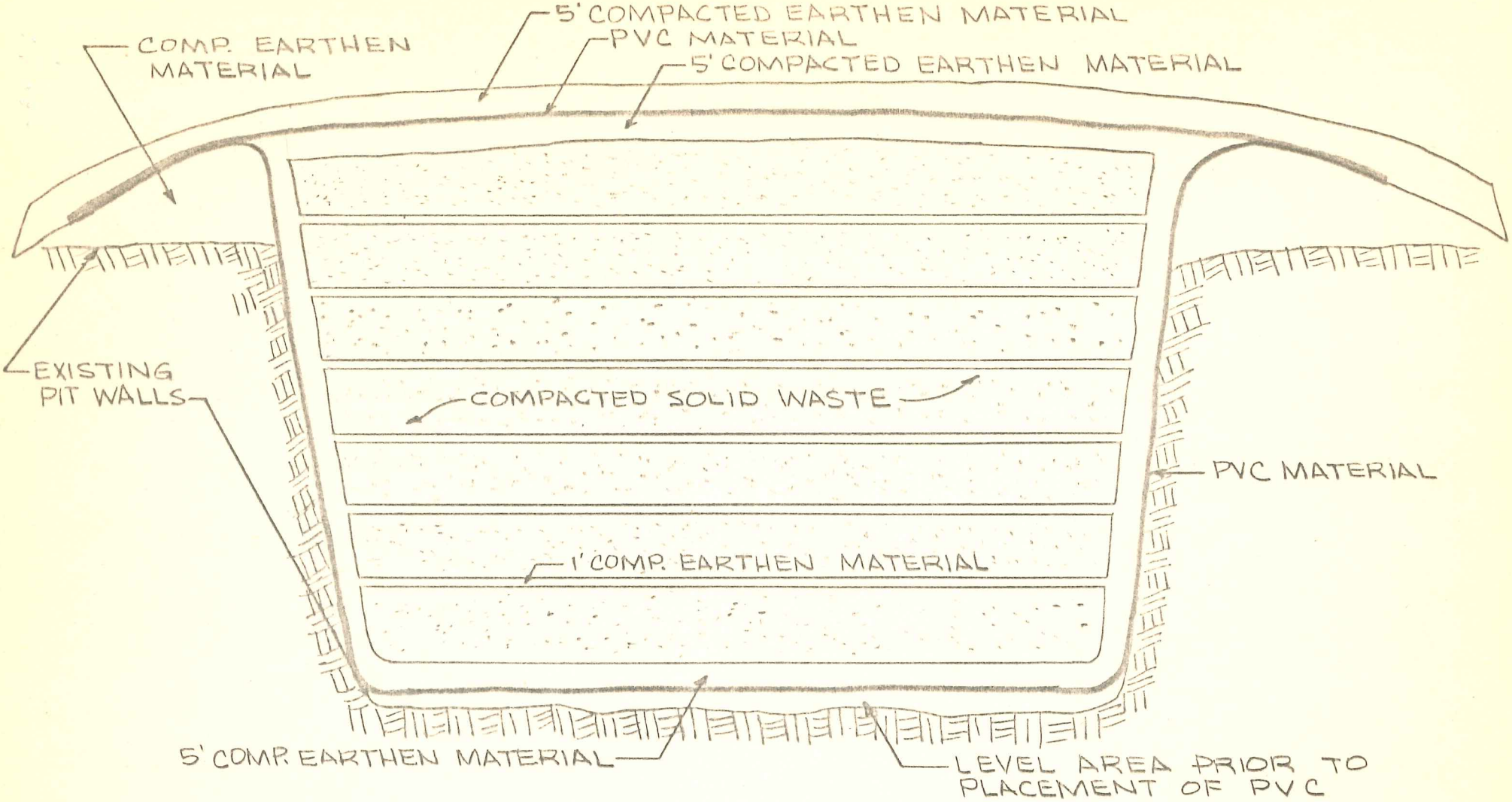
CASTLE HAYNE

The present volume of waste processed at the Flemington Landfill is 286,000 cubic yards per year, with the average 9% growth rate, this figure will be 572,000 cubic yards per year in 1988. The Ideal Cement Manufacturing site in Castle Hayne will be an appropriate sanitary landfill site for New Hanover County until 1990.

To prepare the pit areas to receive the waste material one layer of 20 mil. poly vinyl chloride material as manufactured by Staff Industries of New Jersey, will be placed in a continuous rollout to the top of the pit walls and 20 feet to the side of the pit walls. After care has been taken to not puncture the PVC material, 5 feet of earthen material shall be placed over the PVC prior to placement of waste material. Waste material shall not be placed within 10 feet of the walls of the pit. Earthen material shall be placed within 10 feet of the pit walls and compacted to one foot of cover over each days operation. The earthen material shall be compacted to 95% standard compaction. The waste material shall be taken to the elevation of 10.0 and 5 feet of 95% compacted earthen material shall be placed over the waste.

After the earthen material is placed over the waste, a layer of PVC material shall be placed over the compacted earthen material and extended to tie to the previously placed PVC 20 feet past the pit walls. After the two sections of PVC are connected together and additional 5 feet of compacted earthen material shall be placed.

The area shall immediately be seeded to prevent erosion.



OPERATIONAL PLAN
NEW HANOVER COUNTY LANDFILL

PREPARED BY

NEW HANOVER COUNTY ENGINEERING & SERVICES

WILMINGTON, N. C.

JULY 17, 1978

August 28, 1978

RECEIVED
AUG 30 1978
SOLID WASTE-VECTOR CONTROL

MEMORANDUM

TO: O. W. Strickland

FROM: H. M. Peek

SUBJECT: Proposed Landfill Site - Ideal Cement Quarry

The Groundwater Section does not recommend use of Ideal Cement Manufacturing's quarry as a landfill site. Based on records of wells at the cement plant, the limestone appears to be very permeable. Any leachate from the fill could result in contamination of water supply wells in the area as well as the river.

If any further information regarding this site is needed, please advise.

cj

New Hanover
LTB
No Idff
as per Dover convers
5/17/95 psw Ext #331

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
P. O. Box 2091 Raleigh 27602

JACOB KOOMEN, M.D., M.P.H.
DIRECTOR

1877
One Hundred Years
of Public Health
in North Carolina
1977

June 2, 1978

Mr. Richard S. Shiver
3143 Wrightsville Avenue
Highwoods Park, Building 3
Wilmington, North Carolina 28401

Dear Mr. Shiver:

The Legwin Varnum Farm Landfill plans are enclosed for your review and comments. Since we currently have a 30 to 45-day review process, we are requesting the following:

1. Return comments within twenty-one (21) days. If no verbal or written communication is received within twenty-one (21) days, we will assume there are no objections.

2. If there are major objections or questions, please call me. I would be glad to meet with you on site, or discuss by telephone, any questions or problems.

3. Please return plans with comments.

Sincerely,

J. Gordon Layton
Environmental Engineer
Solid Waste & Vector Control Branch
Sanitary Engineering Section

JGL/wss

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
P. O. Box 2091 Raleigh 27602

JACOB KOOMEN, M.D., M.P.H.
DIRECTOR

1877
One Hundred Years
of Public Health
in North Carolina
1977

June 2, 1978

Mr. Charles Wakild
Regional Engineer
3143 Wrightsville Avenue
Wilmington, North Carolina 28401

Dear Mr. Wakild:

The Legwin Varnum Farm Landfill plans are enclosed for your review and comments. Since we currently have a 30 to 45-day review process, we are requesting the following:

1. Return comments within twenty-one (21) days. If no verbal or written communication is received within twenty-one (21) days, we will assume there are no objections.

2. If there are major objections or questions, please call me. I would be glad to meet with you on site, or discuss by telephone, any questions or problems.

3. Please return plans with comments.

Sincerely,

J. Gordon Layton
Environment Engineer
Solid Waste & Vector Control Branch
Sanitary Engineering Section

JGL/wss

January 18, 1978

Mr. John Q. Bryan
Audiovisual Director
New Hanover County Schools
Post Office Box 390 JHR
Wilmington, North Carolina 28401

Dear Mr. Bryan:

Your letter of January 16, 1978, with reference to the disposal of chemicals has been received.

I have discussed the list of chemicals enclosed with your letter with Dr. R. J. Drye, Head, Environmental Sciences, Laboratory Section, Division of Health Services.

This office has no objection to the chemicals being destroyed by the Fort Bragg personnel provided they have adequate facilities.

Sincerely,

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS/wss

cc: Mr. Fred J. Wood
Sergeant Woody

New Hanover County Schools P. O. Box 390
Wilmington, North Carolina 28401

January 16, 1978

RECEIVED JAN 17 1978 TOXIC CONTROL

Mr. O. W. Strickland
Department of Human Resources
P.O. Box 2091
Raleigh, North Carolina 27602

Dear Mr. Strickland:

We contacted Mr. Jack Levy, Chemistry Department, University of North Carolina at Wilmington, and he did help us get rid of a few items. However, he said he had a few items that he wished to get rid of and would like to have you or Sargent Woody's office at Fort Bragg dispose of the material for him at the same time you dispose of my material.

Enclosed is a list of chemicals and amounts that we wish to be disposed. Fort Bragg personnel said you had to give permission to destroy these items. Would you give them the go ahead?

Sincerely,

John Q. Bryan

John Q. Bryan
Audiovisual Director

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

P. O. Box 2091 Raleigh 27602

JACOB KOOMEN, M.D., M.P.H.
DIRECTOR

1877
One Hundred Years
of Public Health
in North Carolina
1977

November 15, 1977

RECEIVED
JAN 17 1978
SOLID WASTE-VECTOR CONTROL

Mr. John Q. Bryan
Audiovisual Director
New Hanover County Schools
Wilmington, North Carolina 28401

Dear Mr. Bryan:

Your letter of November 8, 1977, and the enclosures have been received.

I have discussed the list of chemicals with Dr. R. J. Drye, Head, Environmental Sciences, Laboratory Section, Division of Health Services. There are some chemicals on the list that are very difficult to dispose of. We would recommend that you contact the proper authority at the University of North Carolina-Wilmington, and see if they might be able to use some of the material.

For those chemicals that cannot be used, we would recommend seeking assistance through Sergeant Woody's office at Fort Bragg.

If the material cannot be disposed of by one of the two recommendations above, please let us know and we will seek other methods.

Sincerely,

O. W. Strickland

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS/wss

cc: Mr. Fred J. Wood

New Hanover County Schools
Wilmington, North Carolina

November 8, 1977

RECEIVED
JAN 1

Mr. O. W. Strickland
Department of Human Resources
P. O. Box 2091
Raleigh, North Carolina 27602

Dear Mr. Strickland:

Enclosed is a list and approximately the amounts of the chemicals we wish to dispose of in a safe manner. Most of these chemicals are in fair to good condition except for the very old items in the unlabeled containers.

We have removed all of these items from our school science classes as a safety measure. Our school system has an active safety committee that is working to promote safety in all phases of our school operations.

Sargent Woody of the 18th EOD Detachment located at Fort Bragg advised us to contact your office for help. The telephone call to your office was our request for help. This letter is to confirm the conversation we had on November 7, 1977.

We do not have the facilities to properly dispose of most of the items and hope that Fort Bragg may assist us with the disposal of these items.

Sincerely,

John Q. Bryan

John Q. Bryan
Audiovisual Director

JQB:as
Enclosure (1)
CC: Dr. Heyward C. Bellamy

CHEMICALS

[redacted]

[redacted]

[redacted]

Ether - 2 gals.
Ether Buytl - 1 gal.
Carbon Tetrachloride - ½ pt.
Ammonium Dichromate - 1 lb.
Alcohol - 1 gal.
Sebacoyl Chloride - small amt.
1-6 Hexandediamine - small amt.
Carbon Disulfide - small amt.
Hydroxylamine Hydrochloride - ½ pt.
Benzene - ½ pt.
Methyl Salicylate - small amt.
Chlorobenzene - 1 pt.
Carbon Tetrachloride - 2 pts.
Azobenzene - ½ pt.
Carbon Tetrachloride - ½ pt.
Dithizone Crystal - small amt.
Ammonium Nitrate - 1 lb.
Barium Peroxide - 2 lbs.
Acid Hydrochloric - 8 gals.
Sulfuric Acid - ½ gal.
Nitric Acid - 2 pts.
Phosphorus (Yellow) ½ lb.
Copper Solution - 1 pt.
Hydrogen Peroxide 30% - 1 pt.
Acetic Acid - 3 gals.
Nitric Acid - 5 gals.
Ammonium Dichromate - 5 lbs.
Potassium Chromate - 1 lb.
Potassium Chromate - ¼ lb.
Sodium Peroxide - 1 lb.
Mercuric Oxide - ¼ lb.
Mercuric Nitrate - ¼ lb.
Cyanide Killing Jar - 5 jars
Phosphorus Powder- 1 lb.
Chromium Chloride - 1 lb.
Benzene - ½ pt.
Sodium Silicate
Xylene - 1 pt.
Hydroflouride Acid - 3 pts.
Citric Acid - 1 gal.
N Amyl Alcohol - 7 gals.
Ammonium Dichromate - 6 lbs.
Carbon Disulfide - 1 lb.
Carbon Tetrachloride - ½ gal.
Formaldehyde - ½ gal.
Potassium Thiocyanate
Mercury - 2 lbs.
Potassium Ferrocyanide - 1 lb.
Several Glass Bottles with unknown liquids and solids.
Some rusted metal cans with unknown contents.

RECEIVED JAN 17

November 15, 1977

Mr. John Q. Bryan
Audiovisual Director
New Hanover County Schools
Wilmington, North Carolina 28401

Dear Mr. Bryan:

Your letter of November 8, 1977, and the enclosures have been received.

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Sincerely,

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS/wss

cc: Mr. Fred J. Wood

New Hanover County Schools
Wilmington, North Carolina 28401

November 8, 1977

RECEIVED
NOV 9 1977
SOLID WASTE-VECTOR CONTROL

Mr. O. W. Strickland
Department of Human Resources
P. O. Box 2091
Raleigh, North Carolina 27602

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Sincerely,

John Q. Bryan

John Q. Bryan
Audiovisual Director

JQB:as
Enclosure (1)
CC: Dr. Heyward C. Bellamy

CHEMICALS

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Ammonium Dichromate - 1 lb.
Alcohol - 1 gal.
Sebacoyl Chloride - small amt.
1-6 Hexandediamine - small amt.
Carbon Disulfide - small amt.
Hydroxylamine Hydrochloride - ½ pt.
Benzene - ½ pt.
Methyl Salicylate - small amt.
Chlorobenzene - 1 pt.
Carbon Tetrachloride - 2 pts.
Azobenzene - ½ pt.
Carbon Tetrachloride - ½ pt.
Dithizone Crystal - small amt.
Ammonium Nitrate - 1 lb.
Barium Peroxide - 2 lbs.
Acid Hydrochloric - 8 gals.
Sulfuric Acid - ½ gal.
Nitric Acid - 2 pts.
Phosphorus (Yellow) ½ lb.
Copper Solution - 1 pt.
Hydrogen Peroxide 30% - 1 pt.
Acetic Acid - 3 gals.
Nitric Acid - 5 gals.
Ammonium Dichromate - 5 lbs.
Potassium Chromate - 1 lb.
Potassium Chromate - ¼ lb.
Sodium Peroxide - 1 lb.
Mercuric Oxide - ¼ lb.
Mercuric Nitrate - ¼ lb.
Cyanide Killing Jar - 5 jars
Phosphorus Powder- 1 lb.
Chromium Chloride - 1 lb.
Benzene - ½ pt.
Sodium Silicate
Xylene - 1 pt.
Hydroflouride Acid - 3 pts.
Citric Acid - 1 gal.
N Amyl Alcohol - 7 gals.
Ammonium Dichromate - 6 lbs.
Carbon Disulfide - 1 lb.
Carbon Tetrachloride - ½ gal.
Formaldehyde - ½ gal.
Potassium Thiocyanate
Mercury - 2 lbs.
Potassium Ferrocyanide - 1 lb.
Several Glass Bottles with unknown liquids and solids.
Some rusted metal cans with unknown contents.

RECEIVED NOV 5 SOLID WASTE-VECTOR

New Hanover
Mailed from Raleigh
office 9-12-77

TB 2 HR

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SANITARY ENGINEERING SECTION

REPORT OF INVESTIGATION OR INSPECTION OF E. I. DuPont

Place visited Phone Conference **Date** September 9 **19** 77

Address E. I. DuPont, P. O. Box 2042, Wilmington, N. C. **Time spent** _____

By whom Mr. Tom Blailock, Medical Entomologist, Division of Health Services

Persons contacted Mr. Claude Blick
(Owner, agent, tenant, manager, other)

Reason for visit _____

Copies to: Mr. Claude Blick, E. I. DuPont, Post Office Box 2042, Wilmington, N. C. 28401

REPORT:

A complaint was filed by a DuPont employee concerning crab lice (Phthirus pubis) which supposedly was acquired from a restroom at the DuPont Plant in Wilmington. Mr. Claude Blick inquired as to what could be done to alleviate the problem. He was also concerned about legal aspects in treating the restrooms for the lice.

I called Mr. W. A. Williams concerning the treatment and any legal problems that could be involved. It was decided that there were none. I conferred with Mr. Blick again on the phone to advise him of my conversation with Mr. Williams and made the following recommendations:

(1) Have a reputable pest concern handle the treatment of the restroom and to treat only when it is necessary.
(2) Advise the plant employees of the problem and how to prevent crab lice infestations.

An inspection was made by Southern Pest Control in the restroom and no lice were found. However, Mr. Blick wanted to make sure, since the problem has appeared twice in the past few years, that there would be no recurrence.

TB/tg

New Hanover
JHR

CAPE FEAR COUNCIL OF GOVERNMENTS
POST OFFICE BOX 1491
SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

RECEIVED
AUG 4 1977
SOLID WASTE-VECTOR CONTROL

Telephone: (919) 763-0191

Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

August 3, 1977

New Hanover
Solid Waste

Mr. Jerry Perkins
Solid Waste and Sector Control Branch
Sanitary Engineering Section
Division of Health Services
Dept. of Human Resources
Raleigh, N. C.

Dear Jerry:

This will confirm your invitation to the meeting of our Solid Waste Management Planning Committee on Tuesday, August 9, at 2 p.m. at Cape Fear Technical Institute, 411 North Front Street, Wilmington.

We look forward to having you and I am enclosing a copy of Survey of Alternates to Landfill Operations which will be reviewed at this meeting.

Sincerely,

Bill Reilly

William T. Reilly
Regional Planning Director

WTR/jm
Enclosure

CAPE FEAR COUNCIL OF GOVERNMENTS
POST OFFICE BOX 1491
SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

Serving Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

Telephone: (919) 763-0191

July 27, 1977

MEMORANDUM

TO: Region "O" Solid Waste Management Planning Committee Members

FROM: Robert W. Sawyer, Chairman

SUBJECT: Meeting of Solid Waste Management Planning Committee
Cape Fear Technical Insitute Board Room
411 North Front Street, Wilmington, N. C.
2 P.M., Tuesday, August 9, 1977

At this meeting the Solid Waste Industrial Subcommittee (SWIS) Chairman Bill Smalley will present the SWIS Report and its recommendations on Survey of Alternates to Landfill Operations in Region "O". Enclosed is a copy of the SWIS Report.

Purpose of the Meeting:

1. To receive and comment upon the report.

2. To transmit the report to the Cape Fear Council of Governments and the local governments of Region "O".

3. To obtain information on the identifications of solid waste regions and agencies under the new solid waste act (Resource Conservation and Recovery Act of 1976).

4. To make a recommendation for the designation of Region "O" as an Areawide Solid Waste Planning Region in accordance with the Resource Conservation and Recovery Act of 1976. Also, to recommend that the Cape Fear Council of Governments be designated as the Solid Waste Areawide Planning Agency for Region "O", since it has demonstrated its capability in solid waste planning on behalf of local governments by conducting two recent studies and plans on solid waste management in Region "O" and is presently engaged in solid waste planning for Region "O".

RWS/bb
Enclosure

cc: Richard Fender (w/o encl.)

RECEIVED
AUG 4 1977
SOLID WASTE-VECTOR CONTROL

REPORT

TO THE

SOLID WASTE MANAGEMENT PLANNING COMMITTEE

CAPE FEAR COUNCIL OF GOVERNMENTS

SURVEY OF ALTERNATES TO LANDFILL OPERATIONS

JUNE 1977

SOLID WASTE INDUSTRIAL SUBCOMMITTEE

Respectfully submitted,

WILLIAM B. SMALLEY
Chairman

The preparation of this report was financed in part through an Urban Planning Grant from the Department of Housing and Urban Development under provisions of Section 701 of the Housing Act of 1954, as amended.

ABSTRACT

TITLE:	Survey of Alternates to Landfill Operations
AUTHOR:	Cape Fear Council of Governments Solid Waste Indsutrial Subcommittee (SWIS)
SUBJECT:	Feasibility of Resource and Energy Recovery for Solid Waste in North Carolina Planning Region "O"
DATE:	June 20, 1977
LOCAL PLANNING AGENCY:	Cape Fear Council of Governments
SOURCE OF COPIES:	Cape Fear Council of Governments P. O. Box 1491 Suite 206, 1 North Third Street Wilmington, North Carolina 28401
HUD PROJECT NUMBER:	CPA-NC-04-00-1001
NUMBER OF PAGES:	49

ABSTRACT:

This is a summary of the study of the Cape Fear Council of Governments on the feasibility of Resource and Energy Recovery from Solid Waste in North Carolina Planning Region "O". The study also studies major energy uses, assesses industrial solid waste generation and disposal, and reviews additional solid waste processing alternatives. The study concludes by recommending necessary steps to extend the regional solid waste planning period from a five to a twenty year plan.

ACKNOWLEDGEMENT

The Solid Waste Management Planning Committee and the Cape Fear Council of Governments wish to acknowledge the efforts of the individuals of the Solid Waste Industrial Subcommittee (SWIS), listed below, for their contribution to solid waste planning in the Cape Fear Region, culminating in the generation of this report.

Chairman -	William B. Smalley	- General Electric Company
	John K. Humphrey	- Hercofina
	William J. Stenger	- E. I. Dupont de Nemours & Company, Inc.
	J. R. Kutrow	- Babcock and Wilcox
	H. E. Vance	- De Poortere Corporation, Timmee Division
	A. G. Bullard	- Carolina Power and Light Company
	R. J. Novak	- Carolina Power and Light Company (alternate member)
	Frank Gunzel	- Diamond Shamrock Chemical Company
	Marshall T. White	- Federal Paperboard Company
	James T. Bradley	- Singer Company
	H. P. Woodard, Jr.	- Southern Bell Telephone & Telegraph Company
	Harry E. Morgan	- Fort Fisher Air Force Base

Robert W. Sawyer, Chairman
Solid Waste Management Planning Committee

Thomas W. Elliott, Chairman
Cape Fear Council of Governments

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INTRODUCTION

A Five-Year Solid Waste Management Plan for North Carolina Planning Region "O" was completed in 1976. During the preparation of the Plan the Solid Waste Management Planning Committee recognized that alternates to landfill for disposal of solid wastes would be a future necessity for Region "O". A subcommittee was formed to study longer range alternates to landfill disposal. This study was to encompass two areas:

1. Resource Recovery
2. Energy Recovery

The subcommittee was activated and was composed of members from industries within the region.

This attached report of the Solid Waste Industrial Subcommittee (SWIS) encompasses the designated areas. The study scope was broadened to develop a list of area energy users, as well as the assessment of industrial waste generation and disposal utilized in the Five-Year Solid Waste Plan; and to review additional solid waste processing alternates.

SUMMARY

The solid waste generation patterns in Region "O" do not lend themselves to economic implementation of complex resource recovery systems at this time. The largest concentration of solid waste in the region (300 tons/day at the Flemington landfill) is less than that for which a resource recovery plan would be economically attractive.

The availability (or nonavailability) of suitable landfill area can very quickly impose new economic burdens on landfill disposal costs thereby changing the relative economic attractiveness of alternate disposal technologies.

The findings of the Solid Waste Industrial Subcommittee (SWIS) are tabulated in the following report as a series of conclusions followed by recommendations for on-going activity in solid waste disposal studies.

The following report provides supplemental information utilized in arriving at these conclusions and recommendations.

CONCLUSIONS

1. The requirement for landfill availability will exist for a minimum of the next 20 years regardless of the solid waste disposal processes selected. The optimum alternate disposal processes still yield a solid waste residue and therefore have a continuing though lesser requirement for landfill availability.

2. Alternate solid waste disposal practices cannot presently compete on an economic basis with the costs of landfill operations. Alternate disposal practices are characterized by:

   High investment requirement

   High operating cost
   - Manpower
   - Energy
   - Maintenance

   and ultimately a need for a landfill operation for the residual solids.

3. At a future point in time it will become an economic necessity to reduce landfill requirements by using alternate disposal methods. The parameters governing this decision will be the availability of landfill sites, income from recovered materials or energy, investments and operating costs associated with the chosen disposal method and hopefully, fully demonstrated technology for the disposal processes.

4. The Region must now determine landfill requirements for the next 20 years and then immediately obtain the land needed to fulfill these requirements. Procurement of the land should not be left to private contractors.

5. The landfill needs should be defined and met on a regional basis. In the unfortunate event that a regional solution is not available it will be necessary for political entities or geographic regions to develop their own solutions. The solutions should be based on the forecast life of the landfill sites obtained.

6. If an area cannot economically obtain adequate land to operate a 20-year landfill, this will then dictate that the time has come to go to more costly but less land consuming waste disposal practices. The disposal practices selected should make the available landfill last the 20-year life.

7. Volume reduction efforts need to be initiated as soon as possible to conserve land.

8. Landfill conservation can be accomplished most expeditiously and economically by installing small package incinerators in comparison with other presently available technologies.

9. Resource recovery developments are emerging but may take 5-10 years to solve many severe problems.

10. New Hanover County is faced with the most immediate need in Region "O".

    A. Suitable land for landfilling in New Hanover County is at a premium and should be conserved since some landfilling will always be necessary.

    B. New Hanover County waste quantity and population are both too small to support a costly, complicated total resource recovery facility in the near future.

<u>In Summary</u>

- There will always be a landfill.
- Economics will govern the disposal process selected.
- It is necessary to obtain firm access to landfill sites capable of handling wastes for the next twenty years.
- The criteria governing the selection of the disposal technology utilized for waste disposal during the next twenty years will be dependent on the availability of land for residue disposal.

RECOMMENDATIONS FOR ON-GOING ACTIVITY

1. Purchase sufficient suitable land as landfilling sites to cover the needs for the next 20 years.

2. Engage a consultant firm for an engineering study on solid waste disposal alternates for the region or those areas of the region that cannot obtain adequate landfill sites for a 20-year period.
   - Scope study should devote at least one-third of its effort to determination of the economics of alternate methods vs landfill.
   - Update scope study as required during the coming years.

3. Continue landfills until economic costs become excessive due to excessive haul distances or landfill prices.

4. Study economics for development of a large centroid landfill that does not necessarily follow political boundaries.

5. Initiate a cooperative study with one of the major steam users in the region to arrive at a firm cost/benefit conclusion for use of solid waste as a supplemental fuel.

6. Conduct public hearings or surveys with the dual purpose of highlighting the region's solid waste disposal picture and obtaining input as to costs the citizens are prepared to pay to reduce landfill requirements. Begin volume reduction actions; i.e. source separation and baling or landfill compaction.

7. Determine what small scale pilot projects on disposal alternates could be implemented on a short term basis to gain experience as to costs and benefits of the alternates.

   The incinerator facility at Wrightsville Beach could yield valuable information to the region, as one example. Another potential for reduction in landfill requirements would be to pilot source separation on selected city and rural routes to determine the effectiveness of this technique.

8. Keep abreast of developing technologies and their associated advantages and disadvantages. Try to hold off commitments to advanced solid waste disposal alternates until proven technology is available on a performance and cost

guarantee basis.

9. Devise a 20-year solid waste plan that includes the flexibility to use technological developments as they become economically feasible.

CHARACTERIZATION OF WASTE GENERATION PATTERNS IN REGION "O"

The economic feasibility of solid waste disposal alternates to landfill is greatly dependent on the quantity of waste available and on the geographic distribution of the wastes. The waste generation patterns in Region "O" are not conducive to the development of a central regional processing facility. The total waste generated that is presently disposed of in public landfills is 2,800 tons per week. One-half of this tonnage is deposited in the Flemington landfill. Another fourth of the tonnage is deposited in the Columbus County landfill near Whiteville, approximately 40 miles away. The remaining wastes are generated and disposed of at six smaller landfills throughout Region "O".

The largest core of wastes is the 1,500 tons per week at Flemington--a quantity that is minimal when disposal practices other than landfill are considered.

The industrial waste generation survey established that 7,500 tons per week of solid waste was generated in Region "O" by industry, and that only 400 tons per week of this was being sent to public landfills. The survey also showed that the rest of this material would not impact alternate solid waste disposal plans. Twenty-six hundred tons per week is already burned for supplementary fuel or recycled as saleable scrap. Thirty-one hundred tons per week consisting primarily of ash or sludge is disposed of in on-site landfills as is 800 tons per week of potentially burnable material.

Another characterizing factor is the relative availability or non-availability of suitable sites for landfilling through Region "O". New Hanover County, the largest generator of municipal type wastes is the most limited in terms of potential landfill sites. Other areas such as Brunswick and Pender Counties have comparatively low generation rates and more potential landfill sites.

Table 1 represents some of these characteristics as well as effectiveness of land utilization in landfill.

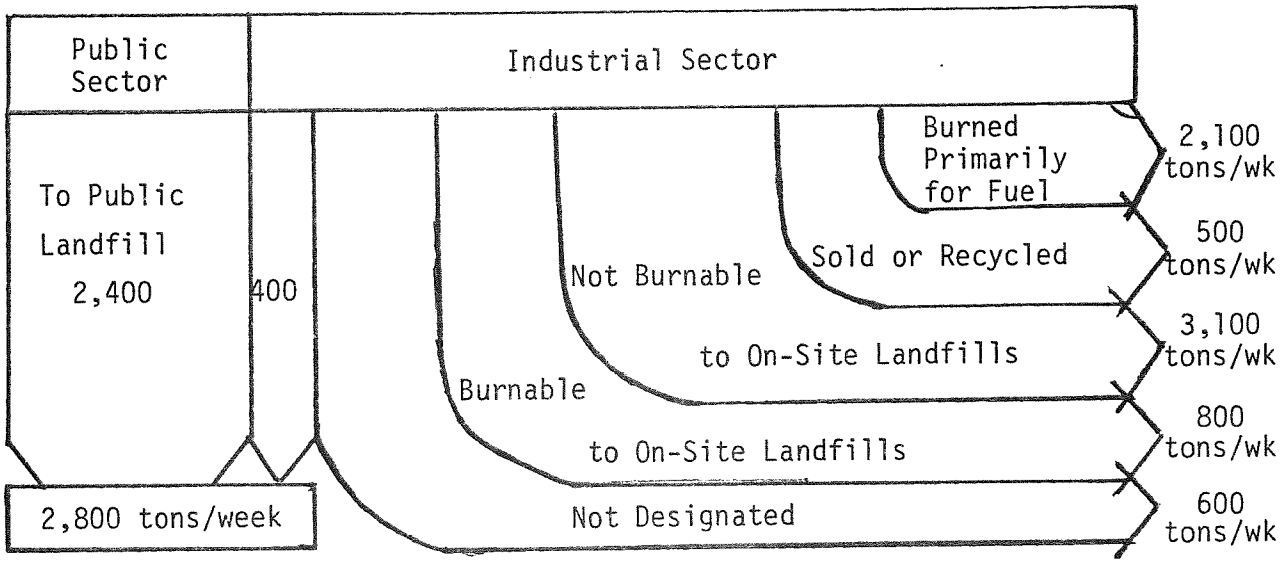
TABLE 1*

Landfill Location	Acres of Land Used Per Year	Tons Per Week Landfilled	Tons/Week per Acre/Year	1,000 people per acre utilized
Leland	1	333 in these four locations	56	5,800
Beaver Dam	2			
Shallotte	2			
Ocean Isle	1			
Whiteville	7	807	115	7,100
Flemington	28	1,179	34	2,600
Carolina Beach	7			
Burgaw	3	304	80+	4,500+
Topsail	1			

Source separation for recovery of energy or to recover saleable materials already has a significant favorable impact on reducing Region "O" landfill requirements. As shown in this chart, one-fourth of the solid waste generated does not go to landfill of any sort.

Total Solid Waste Generation in Region "O"*

Public Sector		2,400 tons/week
Industrial Sector		7,500 tons/week
	TOTAL	9,900 tons/week



* Basis - Five-Year Solid Waste Management Plan for North Carolina Planning Region "O", Cape Fear Council of Governments, 1976.

Study Methodology

The Solid Waste Industrial Subcommittee (SWIS) of the Solid Waste Committee of the Cape Fear Council of Governments was formed in December 1975 to provide input from industry for the Region "O" Five-Year Plan.

The subcommittee consisted of:

William B. Smalley, General Electric Company, Chairman
John K. Humphrey, Hercofina
William J. Stenger, E. I. DuPont de Nemours & Company, Inc.
J. R. Kutrow, Babcock and Wilcox
H. E. Vance, De Poortere Corporation, Timme Division
A. G. Bullard, Carolina Power and Light Company
R. J. Novak, Carolina Power and Light Company (alternate)
Frank Gunzel, Diamond Shamrock Chemical Company
Marshall T. White, Federal Paperboard Company
James T. Bradley, Singer Company
H. P. Woodard, Jr., Southern Bell Telephone & Telegraph Company
Harry E. Morgan, Fort Fisher Air Force Base

The initial duty of this subcommittee was to conduct an industrial survey to determine the disposition of industrial solid wastes. This disposition is shown graphically and tabulated in Figure 1 and Table 2.

The industrial survey also included energy usage to assist in any future studies with regard to energy consumption and generation.

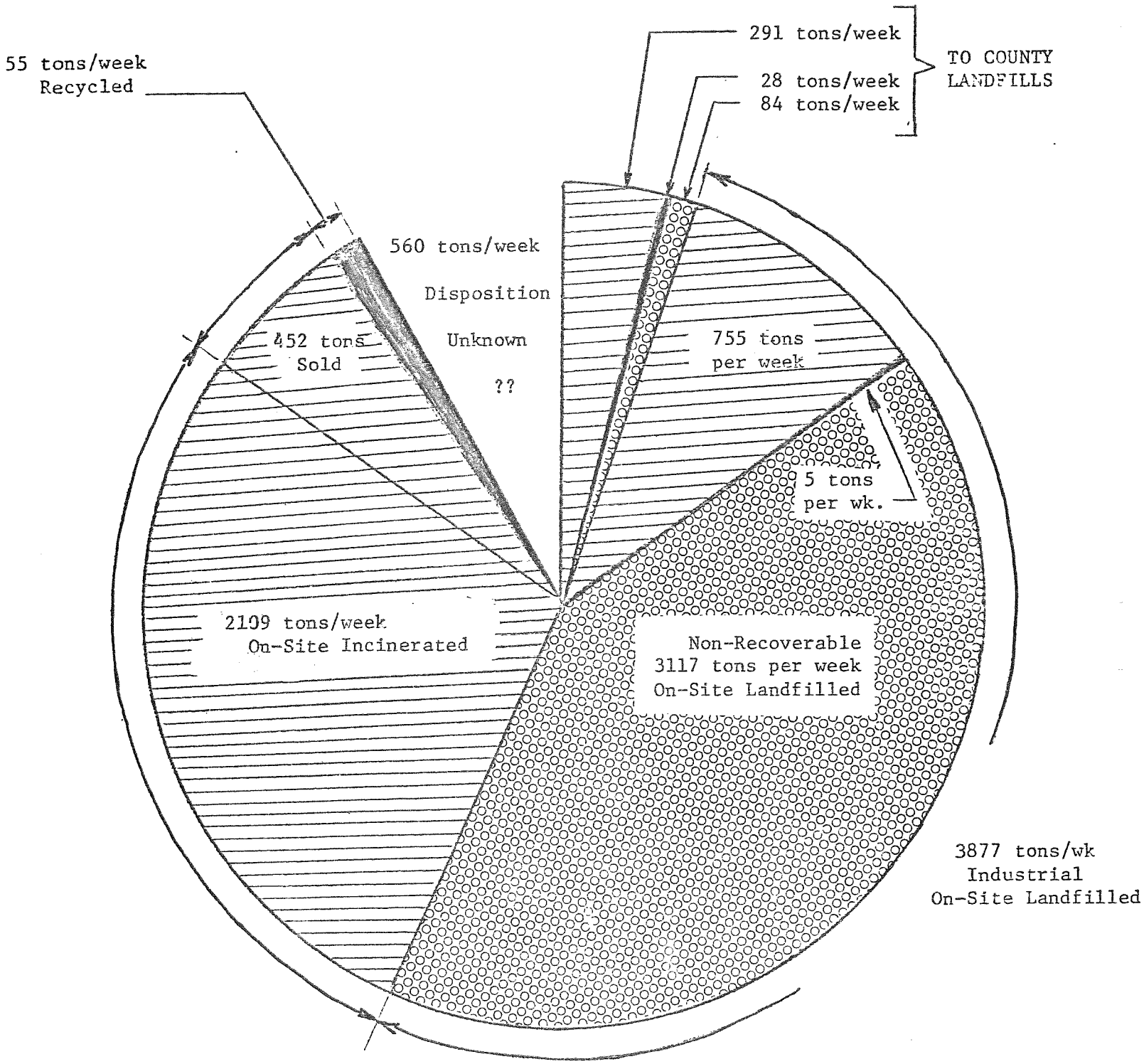
After the industrial survey was completed, SWIS then undertook a technical study of methods of solid waste disposal so as to offer some guidelines which should be considered for long-range planning in Region "O". The primary emphasis of the study was directed toward a broad assessment of the practicability or degree of readiness of available processes and their applicability to Region "O" waste generation patterns. The committee did not attempt to do a complete engineering study of each process nor a parallel detailed economic study.

Two primary criteria were quickly encountered--

1. No process eliminates solid waste. The essentials are volume reduction to extend landfill life and the objective to utilize the most economic method available to obtain the necessary landfill life.

2. The quantities of wastes available at central areas in Region "O" are presently minimal for most alternate processes to be economically feasible under present market conditions.

DISPOSITION OF INDUSTRIAL SOLID WASTES IN REGION 'O'



COMBUSTIBLES

Potential RECYCLABLES
(metals, glass)

NON-RECOVERABLES
(fill, ash, sludge)

TABLE 2

INDUSTRIAL QUESTIONNAIRE DATA SUMMARY (TONS per WEEK)

LOCATION	DISPOSITION of SOLID WASTES by County & Region	COMPOSITION OF SOLID WASTE MATERIALS: COMBUSTIBLES						NON-COMBUSTIBLES						SPECIAL WASTES					
		WOOD	PAPER	PLASTICS	WASTE YARN	TRASH	SUB-TOTAL	FERROUS METALS	NONFERROUS METALS	GLASS	FILL MATERIALS	RUBBISH	SUB-TOTAL	OILS	ASH	SLUDGE	OTHER	SUB-TOTAL	TOTALS
BRUNSWICK	A. to County Landfills at																		
	(1) Beaver Dam							3	6		2		11						11
	(2) Leland	40	3				43												43
	B. in On-Site Landfills																60	60	60
	C. On-Site Incineration																1	1	1
	D. Sold or Recycled																		
	E. Disposition Unknown																2	2	2
	COUNTY TOTALS	40	3				43	3	6		2		11				63	63	117
COLUMBUS	A. to Whiteville Landfill	*	17	1	*	1	19	*		*		*	*						19
	B. in On-Site Landfills	480	14			1	495	5			49	2	56						551
	C. On-Site Incineration	1280					1280												1280
	D. Sold or Recycled	380	3	*	1		384	5					5						389
	E. Disposition Unknown															350		350	350
	COUNTY TOTALS	2140	34	1	1	2	2178	10			49	2	61			350		350	2589
N.H. Co.	A. to Flemington Landfill	152	67	2		7	228	5	2	12	82		101						329
	B. in On-Site Landfills	136	1	*			137			*	12		12		2934	60		2994	3143
	C. On-Site Incineration	712	74	10			796							32				32	828
	D. Sold or Recycled							45	3				48	1			1	2	50
	E. Disposition Unknown			1			1	4			203		207						208
	COUNTY TOTALS	1000	142	13		7	1162	54	5	12	297		368	33	2934	60	1	3028	4558
PENDER	A. to Burgaw Landfill	1					1												1
	B. in On-Site Landfills	123					123												123
	C. On-Site Incineration																		
	D. Sold or Recycled	68					68												68
	E. Disposition Unknown																		
	COUNTY TOTALS	192					192												192
REGION	A. to County Landfills	193	87	3	*	8	291	8	8	12	84	*	112						403
	B. in On-Site Landfills	739	15	*		1	755	5		*	61	2	68		2934	60	60	3054	3877
	C. On-Site Incineration	1992	74	10			2076							32			1	33	2109
	D. Sold or Recycled	448	3	*	1		452	50	3				53	1			1	2	507
	E. Disposition Unknown			1			1	4			203		207			350	2	352	560
	REGIONAL TOTALS	3372	179	14	1	9	3573	67	11	12	348	2	440	33	2934	410	64	3441	7456

of less than one ton per week.

The SWIS studied methods of volume reduction in the following sequence:

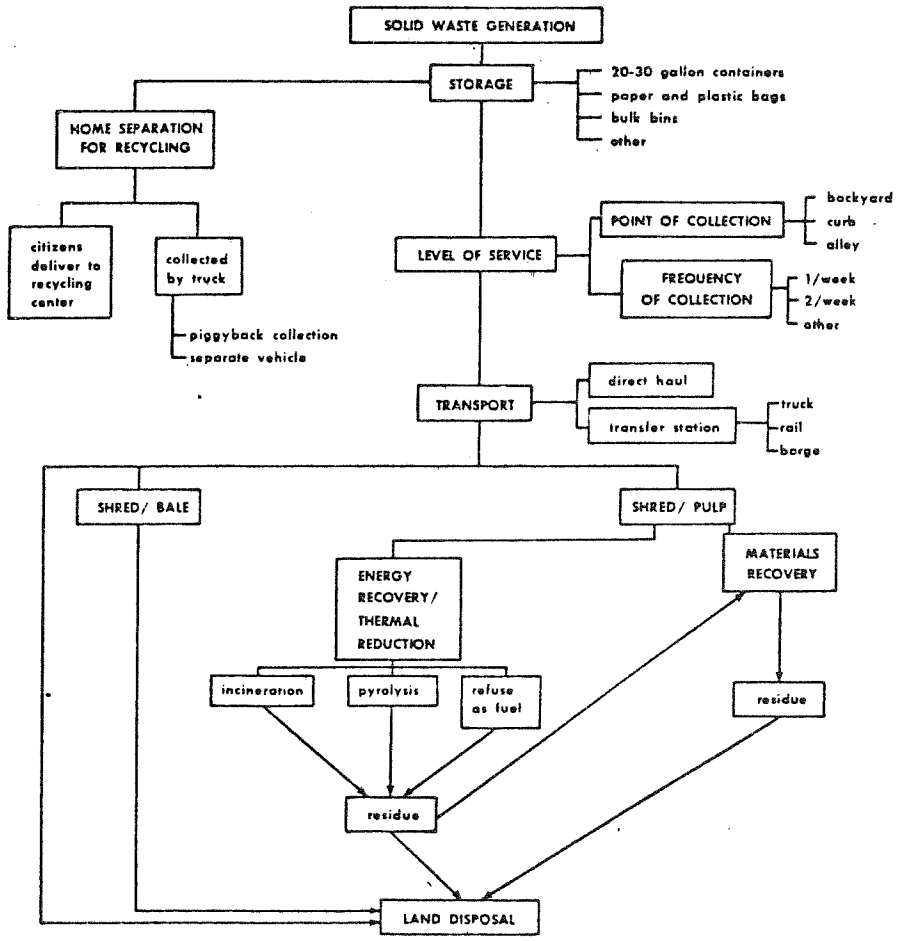
Source Separation
Mechanical Reduction
Burning
Energy Recovery

The information collected is arranged in these four categories in following sections. Information pertaining to each of the categories was collected from federal and state agencies, equipment vendors, municipalities operating systems, consultants, and from publications. We are indebted to those who contributed their time and expertise to provide this information.

OVERVIEW OF DECISIONS TO BE MADE FOR SOLID WASTE DISPOSAL

Solid waste management is concerned largely with four major functions: collection, transport, processing, and disposal (Figure 2). Figure 2 is a flowchart which illustrates the decisions which must be made from the point of generation to the ultimate disposal of residential solid waste. These decisions encompass the four major solid waste functions: collection (including storage, level of service, and the separation of materials for recycling); transport; processing (including volume reduction through shredding and/or baling and resource recovery); and ultimate disposal.

FIGURE 2
SOLID WASTE MANAGEMENT DECISION ALTERNATIVES



The choice of solid waste storage containers must be evaluated in terms of both environmental effects and costs. From the environmental standpoint, some storage containers can present health and safety problems to the collectors as well as to the general public. Therefore, the decision facing a community is, which storage system is both environmentally sound and the most economical given the collection system characteristics? For example, paper and plastic bags are superior to many other containers from a health and aesthetic standpoint and can increase productivity when used in conjunction with curbside collection. However, with backyard collection systems, bags have little effect on productivity.

Another factor to be considered in examining storage alternatives is home separation of various materials for recycling. In a number of communities, newsprint is collected for recycling by either the regular collection truck equipped with a special bin for the paper or a separate truck. The primary factor to consider in implementing a separate collection system is whether the benefits of paper recovery outweigh the costs involved. The economic viability of separation collection depends primarily on the local market price for the paper and the degree of participation by the citizens. If these factors are positive, it may be possible to implement a paper recovery system with no increase and perhaps even a savings in collection operating costs; often no additional capital expenditures are required.

The distance between the disposal site and the center of the city will determine the advisability of including a transfer station in the transport system. In addition to distance traveled to the disposal site, the time required for transport is a key factor, especially in traffic-congested large cities.

The tradeoffs involved in transfer station operations are the capital and operating costs of the transfer station as compared to the costs (mostly labor) of having route collection vehicles travel excessive distances to the disposal site. These tradeoffs can be computed to find the point at which transfer becomes economically advantageous.

The sheer quantities of solid waste to be disposed of daily makes the problem of what to do with the waste, once it has been collected, among the most difficult problems confronting community officials. A crisis situation can develop very quickly, e.g., in the case of an incinerator or land disposal site forced to shut down because of failure to meet newly passed environmental regulations, or it can build gradually over a period of time if needed new facilities are not properly planned for and put into service.

There are three basic alternatives for disposal, with subalternatives for some of them (Table 3). The three major alternatives are : direct disposal of unprocessed waste in a sanitary landfill; processing of waste to reduce volume followed by land disposal; and processing of waste to recover resources (materials and/or energy) with subsequent disposal of the residues.

Direct haul to a sanitary landfill (with or without transfer and long haul) is usually the cheapest disposal alternative in terms of both operating and capital costs. It may not always be the best from an environmental standpoint because of the danger of water pollution from leachate. This alternative is also wasteful of land and resources.

With the second alternative, processing prior to land disposal, the primary

TABLE 3

COMPARATIVE ECONOMICS AND FEASIBILITY OF MAJOR RESOURCE RECOVERY AND DISPOSAL OPTIONS

Alternative	Feasibility	Net operating cost per ton*
Sanitary landfill	Institutional--there may be active citizen opposition to potential locations. Technical--depends of geological characteristics of the land. Economic--decided savings in cost per ton in facility handles over 100 tons per day.	$1.50-$8
Conventional incineration	Technical--feasible. Economic--may not economically meet new air pollution standards.	$8-$15
Small incinerator	Technical--feasible. Economic--varies with particular case.	$8-$15
Steam generation from waterwall incinerators	Technical--several incinerators are in operation, only 2 are marketing the steam produced. Economic--markets for steam are limited.	$4-$10
Solid waste as fuel in utility or industrial boiler	Institutional--owner/operator must contract with utility for sale of electricity. Technical--combustion in utility boiler as supplement to coal has been demonstrated in St. Louis. Economic--practical feasibility depends on cooperation of local utility or user industry.	$6-$10

(Continued)

TABLE 3

COMPARATIVE ECONOMICS AND FEASIBILITY OF MAJOR RESOURCE RECOVERY AND DISPOSAL OPTIONS--Concluded

Alternative	Feasibility	Net operating cost per ton*
Pyrolysis:		
Solid waste converted into combustible gas and oil	Technical--has been demonstrated at 200-ton-per-day pilot plant. Economic--transportability and quality of the fuel produced are primary factors. Ability to store and transport fuel offers broad market application.	$4-$12
Heat recovery to generate steam	Technical--1,000-ton-per-day plant is in shakedown operation in Baltimore. Air pollution problems have been encountered. Economic--markets for steam are limited.	$4-$8
Materials recovery		
Newsprint, corrugated and mixed office papers	Technical--separate collection, possibly with baling, is required. Economic--markets are variable; when paper prices are high, recovery can be profitable.	
Mixed paper fibers	Technical--technology has been demonstrated at 150-ton-per-day plant in Franklin, Ohio. Economic--fiber quality from Franklin plant is low, suitable only for construction uses.	$7-$13
Glass and aluminum	Technical--technology being developed. Economic--market potential is adequate but system economics undertain as yet.	

* Includes amortization of capital equipment.

objective of the processing is to reduce the volume of wastes. Such volume reduction has definite advantages since it reduces hauling costs and ultimate disposal cost, both of which are, to some extent, a function of waste volume. However, the capital and operating cost to achieve this volume reduction is significant and must be balanced against the savings achieved. An additional consideration is the environmental benefits which might be derived from the volume reduction process.

The third category of disposal alternatives is those processes which recover energy or materials from mixed solid waste. In terms of economics, there are significant capital and operating costs associated with all these energy and/or materials recovery systems. Revenues from the sale of recovered products will reduce the net costs of recovery, however. Not only do resource recovery systems achieve the goal of resource conservation, but the residuals of the processes require must less space for land disposal than unprocessed wastes.

Affecting all four major functions are basic decisions regarding how the solid waste system will be managed and operated. This includes how the system will be financed, which level of government will administer it, and whether a public agency or private firm will operate the collection, transport, processing, and disposal functions. The criteria most relevant for making these decisions are the institutional factors of political feasibility and legislative constraints.

Financing is needed for operating costs and capital costs. For operating revenues, there are two sources: the city's general tax fund or a direct charge on the users of the system. A direct charge may be a fixed sum or vary according to the level of service rendered. The issue of political feasibility becomes

relevant when a charge from tax financing to a user charge is being considered. There is often citizen opposition to receiving a bill for a service which was previously provided "for free" (hidden in the property tax).

For capital expenditures, municipalities have basically two alternatives: borrowing and current revenues. The decision of which method will be used is affected by factors such as the financial status of the city, citizen attitudes, legislative constraints on debt limits or long-term contracts, and the size of the project to be undertaken.

The ownership and operation of residential collection systems range from completely public collection to collection by private contractors in open competition. One common pattern is the collection of residential waste within the city limits by a municipal system under the public works department and collection of adjoining suburban areas by private contractors. In other communities, collection is divided between the public and private sectors with private contractors operating under exclusive franchises with the city. These are just two of the many patterns of ownership and operation of the collection function which exist within the country today. The ownership and operation of processing and disposal functions are also under public and private auspices and combinations of both.

Regardless of whether solid waste management systems are operated by the public or private sector, the local community must establish regulatory control over these activities. A local regulatory program should include: developing and implementing ordinances and regulations; establishing inspection, monitoring,

and complaint procedures and programs; initiating enforcement procedures and programs; and developing bid specifications and awarding contracts for services to be provided by private firms. EPA has promulgated "Guidelines for Thermal Processing and Land Disposal of Solid Waste" (40 CFR 1, 240 and 241), and is currently in the process of developing guidelines for the storage and collection of solid waste, source separation for materials recovery, beverage containers, recovery of resources from mixed solid waste, and the procurement of goods that contain recycled materials. These guidelines are mandatory only for Federal facilities; however, they can provide guidance to local officials and should be incorporated in local ordinances where appropriate.

The following pages present a brief overview of some issues and the alternatives available in dealing with them, plus advantages and disadvantages of each alternative and the conditions which favor one alternative over another (Tables 4, 5, and 6).

TABLE 4

POTENTIAL ADVANTAGES AND DISADVANTAGES OF TYPES OF RESIDENTIAL WASTE STORAGE CONTAINERS, AND CONDITIONS THAT FAVOR THE USE OF EACH

Alternative	Potential advantages	Potential disadvantages	Conditions which favor alternative
Paper or plastic bags	Easier to handle--no lids to be removed or replaced Less weight to lift Reduces spillage and blowing litter when loaded in truck One-way container--no cans left at curb Eliminates odors and necessity to clean dirty cans Prevents fly entrance Increases speed and efficiency of collection Reduces contact of collector with waste	Cost per bag Bags can fail if overfilled or if too thin Susceptible to animal attacks Not suitable for bulky, heavy, or sharp objects May be difficult to obtain due to energy crisis	Curbside collection
Metal or plastic cans (20-to-30-gal)	Reasonable size for collector to lift Economical	Must be cleaned regularly when not used with liners	Backyard collection
Bulk containers for mechanized collection	More efficient than manual collection	Residents oppose storage of other people's waste on their property	Alley space available for storage
Drums (55-gal)	None	Lower collection efficiency Excessive weight can result in back injury and muscle strain Difficult to handle Lack of lids allows insects to breed in waste and odors to escape Rust holes at bottom of drum allow rodents to feed on waste	Unacceptable alternative
Stationary storage bins	None	Inefficient--must be emptied manually Lack of proper cover leads to insect and rodent infestation Necessity for hand shoveling of wastes poses health hazard to collectors	Unacceptable alternative

TABLE 5

POTENTIAL ADVANTAGES AND DISADVANTAGES OF SOURCE SEPARATION OF RECYCLABLE MATERIAL FROM SOLID WASTE, AND THE CONDITIONS THAT FAVOR IT

Alternative	Potential advantages	Potential disadvantages	Conditions which favor alternative
All alternatives: separate collection, piggyback collection, recycling centers	Simple to implement Reduces solid waste volume at sanitary landfill If paper prices are high there may be a decrease in collection costs	Requires citizen cooperation Requires market for separated waste materials Results in separation of only a small portion of the total waste stream Scavengers may take material for private gain	Markets exist for the materials recovered Citizen support of resource recovery is high

TABLE 6

POTENTIAL ADVANTAGES AND DISADVANTAGES OF DIRECT HAUL TO DISPOSAL SITES AND USE OF TRANSFER STATIONS, AND THE CONDITIONS THAT FAVOR EACH METHOD

Alternative	Potential advantages	Potential disadvantages	Conditions which favor alternative
Direct haul by collection trucks to disposal site	Requires no capital expenditure	Changes in disposal site location require rerouting of all collection trucks Nonproductive time spent in transport increases costs	Close-in disposal sites available Low labor rates Nonurban area
Transfer station	Cuts down on nonproductive collection time In-town location where residents can bring their waste Makes collection operation independent of the actual disposal site Facilitates the addition of resource recovery or volume reduction equipment at the transfer site Permits land reclamation (e.g., filling in strip mines) at location distant from generation point Capital and operating costs of collection vehicles are reduced.	Requires extra materials handling step Requires capital expenditures for land, structures, and equipment To achieve savings in existing system, a reduction in the number of crews is needed Difficult to find recipient of waste outsite of immediate political jurisdiction There is usually citizen opposition to proposed transfer sites if located near residential areas	High labor costs Distant disposal site Large collection crews Shortage of land for sanitary landfills at reasonble price Urban areas

TABLE 7

POTENTIAL ADVANTAGES AND DISADVANTAGES OF SOLID WASTE PORCESSING AND DISPOSAL METHODS, AND THE CONDITIONS THAT FAVOR EACH

Alternative	Potential advantages	Potential disadvantages	Conditions which favor alternative
Sanitary landfilling	Simple, easy to manage Initial investment and operating costs are low Can be put into operation in short period of time May be used to reclaim land Can receive most types of solid waste, eliminating the necessity for separation of wastes	Proper sanitary landfill standards must be observed or the operation may degenerate into an open dump Difficult to locate new sites because of citizen opposition Leachate may create water pollution Production of methane gas can constitute a fire or explosion hazard Obtaining adequate cover material may be difficult	All solid waste systems must have a landfill for unprocessed waste or for the residues resulting from processing facilities
Sanitary landfilling of baled solid waste	Extends life of landfill (double that of a fill for unprocessed wastes) Lowers operating costs at the disposal site Reduces hauling costs where distant sites are used	Resource recovery is precluded once bale is formed Leachate may create water pollution	Long hauls needed to reach landfill sites Shortage of landfill sites requires maximum utilization of available land
Sanitary landfilling of shredded solid waste	Extends life of landfill Does not require daily cover under some conditions Waste is more easily placed and compacted Vehicles do not become mired in waste in inclement weather Reduces problems with vectors Does not support combustion or lead to blowing litter Shredding at transfer station or at landfills may be first step in implementing a resource recovery system	Jamming and bridging of the feeding equipment can reduce throughput of the mill High level of component wear, especially of hammers Danger to employees from flying objects, explosions, fires within the mills, and noise Lechate may create water pollution Maintenance and repair costs are high	Cover material is difficult to obtain Shortage of landfill sites requires maximum utilization of available land

(Continued)

TABLE 7

POTENTIAL ADVANTAGES AND DISADVANTAGES OF SOLID WASTE PROCESSING AND DISPOSAL METHODS, AND THE CONDITIONS THAT FAVOR EACH--Concluded

Alternative	Potential advantages	Potential disadvantages	Conditions which favor alternative
Incineration	Extends life of landfill May be more economical than hauling unprocessed waste to distant landfill	Large capital investment High operating cost Large expenditures may be required for air pollution control equipment Conventional incinerators generate large quantities of wastewater which must be treated and disposed of	Land available for sanitary landfilling is at a premium Few if any conditions favor conventional incineration
Materials recovery systems	Less land required for solid waste disposal High public acceptance Lower disposal costs may result through sale of recovered materials and reduced landfilling requirements	Technology for many operations still new, not fully proven Requires markets for recovered materials High initial investment required for some techniques Materials must meet specifications of purchaser	Markets for sufficient quantities of the reclaimed materials are located nearby Land available for sanitary landfilling is at a premium Heavily populated area to ensure a large steady volume of solid waste to achieve economies of scale
Energy recovery system	Landfill requirements can be reduced Finding a site for an energy recovery plant may be easier than finding a site for a landfill or conventional incinerator Total pollution is reduced when compared to a system that includes incineration for solid waste disposal and burning fossil fuels for energy May be more economical than environmentally sound conventional incineration or remote sanitary landfilling High public acceptance As cost of fossil fuel rises, economics become more favorable	Requires market for energy produced Most systems will not accept all types of wastes Specific needs of the energy market may dictate parameters of the system design Complex process requiring sophisticated management Needs relatively long period for planning and construction between approval of funding and full-capacity operation Technology for many operations still new, not fully proven	Heavily populated area to ensure a large steady volume of solid waste to take advantage of economy of scale Availability of a steady customer for generated energy to provide revenue Desire or need for additional low-sulfur fuel source Land available for sanitary landfilling is at a premium

SOURCE SEPARATION

Source separation is the dividing of material for recycle or sale at the point of generation. The favorable impact which existing source separation projects have on Region "O" landfill requirements has detailed in the study methodology section where it was shown that one-fourth of the total waste generated does not go to a landfill.

Additional reduction in landfill requirements can be made by including commercial sources of specific types of recyclable wastes in source separation activities and by extending the concept of source separation to domestic wastes. Source separation programs on domestic routes can reduce landfill requirements without significant investment in waste processing facilities. A characteristic of domestic source separation, however, is that benefits at best are a minimal reduction in landfill requirements. For an example, a typical value for the newspaper content of municipal solid waste is 6% of the total weight collected. If we were able to achieve a 50% recovery of newspapers in the total area, we would reduce the weight collected by 3% or less than 50 tons per week. Source separation programs involving domestic waste are highly visible and require participation--voluntary or mandatory from each homeowner.

A source separation program is similar to any recycle program of waste materials in that economics are dependent on market prices. In most cases during some extended periods the separated wastes will still end up in a landfill because of an inability to sell the collected material. The collection program must be set up to provide for disposal whether there is a market or not.

Recommendation - Consider piloting source separation programs to determine their cost effectiveness. The following are suggested:

- Selected residential collection route(s)
- A group of commercial locations for cardboard and packing materials
- A rural route

MECHANICAL REDUCTION

Mechanical reduction of municipal solid waste (MSW) can be utilized to reduce landfill requirements. This reduction is obtained by reducing the MSW volume by eliminating voids. The reduction in volume requirements can be attained by shredding the MSW thereby reducing the voids in the MSW. The reduction can also be attained by an operation called baling. In baling the voids are eliminated by squeezing or compressing the MSW into dense blocks which can then be stacked in the landfill. In shredding the voids are reduced by producing a uniform particle size. Baling of either shredded or unshredded MSW is feasible.

Both baling and shredding have an additional potential of reducing landfill requirements because the amount of soil used to cover each layer of waste in a landfill can be sharply reduced when compared to MSW that has not been processed.

Baling

The facility required to bale solid wastes can vary considerably in cost and scope depending on esthetic requirements, land contour, and other factors unique to a particular installation. The operation is centered around the operation of the baling machine. This is a device designed to compress loose MSW as received into dense blocks by the use of hydraulic pressure. Volume reductions ranging from 3-8:1 have been demonstrated. Bale densities vary from 50 to 70 pounds per cubic foot depending on baling pressure which range from 1000 to 3000 psi. Fifteen hundred to two thousand psi appears to be the necessary pressure for preparing a solid bale that can be shipped to a landfill. The final landfill density is 1 1/2 to 2 times that attained by good sanitatary landfill practices with unprocessed MSW.

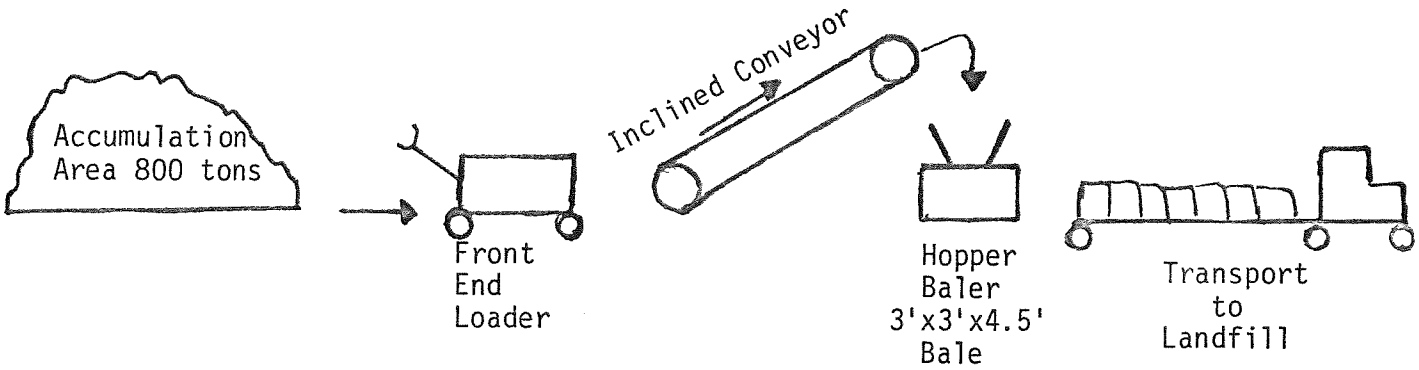
Moisture is squeezed out during the baling process, particularly on rainy collection days. This moisture would most likely require treatment before discharge to a receiving stream.

This type of facility cannot handle all types of MSW, therefore there must be provision for some material to go directly to landfill, i.e. tree trunks, ashes, large quantities of grass cuttings and some other materials are not suitable for baling.

Schematic

500 ton per day facility (St. Paul, Minn.)

- 120 x 240 ft. building sprinkled
- Accumulating floor holds 800 tons



Alternate-eliminate inclined conveyor and place baler and hopper in pit.

23 mile haul - 4 trucks, 2 drivers
$1.3 mm facility cost excluding land; $6/ton operating cost

Pros

Roughly doubles landfill life
Bales are shippable long distances, even by rail
Minimum cover needed at landfill
Can handle most types of wastes
Quicker use of site after fill completed

Cons

Liquid waste may require treatment
No resource recovery
Final technology of landfill not known

Data Summary - Baling Operations

Location	Start-Up Year	Investment	Size	Operating & Capital Cost*
Cobb County, Georgia	1975	$ 2.4mm	300 t/d	6.20/ton estimate
Omaho	1975	$ 4.5mm	400 t/d	6.70/ton estimate
Atlanta	1976	$ 2.5mm	500 t/d	5.90/ton

* does not include transfer and disposal costs

Applicability to Region "O"

Baling has two benefits that are directly applicable to the problems faced by Region "O". Landfill requirements are halved when baling is utilized thus doubling the life of available landfill sites. Also, baled wastes are readily transportable from a central baling station to remote landfill sites. The bales from the 500 ton/day St. Paul baling activity are hauled readily over flat-bed trucks.

Baling lends itself readily to the concept of a central station strategically located in the areas generating the largest tonnage. This would allow short hauls by the packer trucks with the longer runs to the landfill being made by more efficient trucks with a single driver.

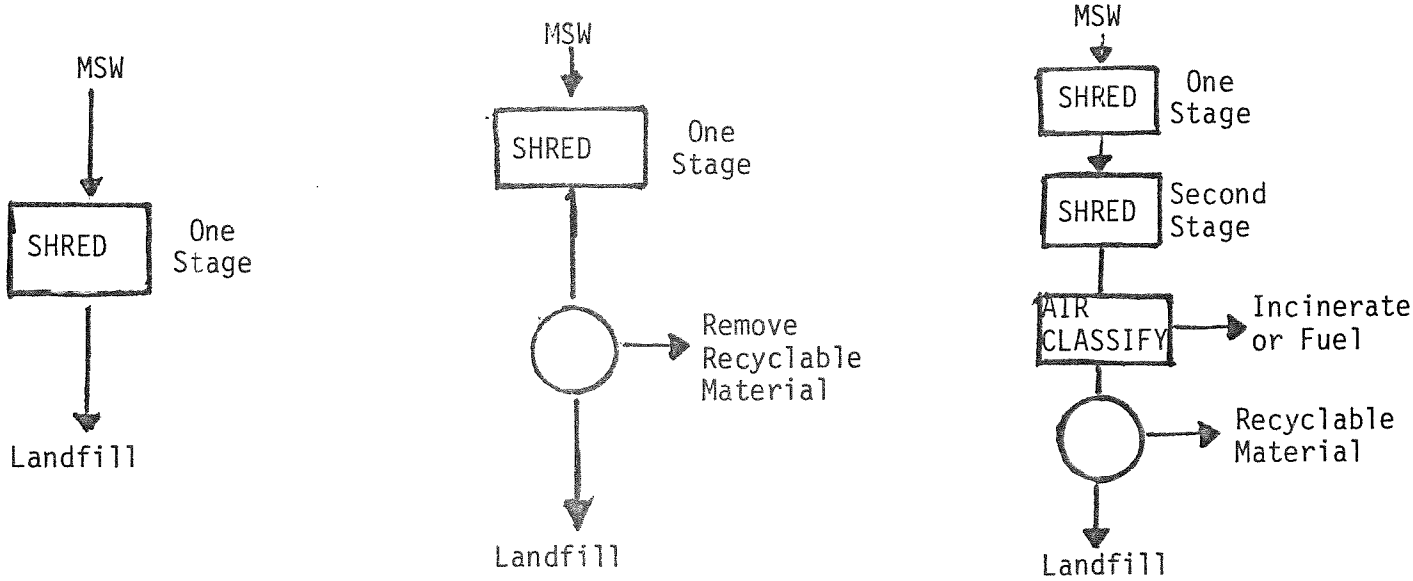
Shredding

As with the case in baling facilities, shredding operations vary considerably in cost and complexity depending on the characteristics of the specific installation. A shredder facility designed to produce a fuel for use in boilers and to also include recovery of recyclable material can be a very expensive and complex installation. A shredding facility designed to only reduce volume for landfilling purposes can be relatively simple though in all cases shredding operations include high maintenance and electrical power costs as well as requiring a substantial investment.

Shredding entails size reduction of MSW to small pieces ranging from 8"x8" to 1"x1" depending on the desired end use. The larger sizes would be intended for direct landfill while the smaller sizes would be intended for resource recovery and use as a fuel.

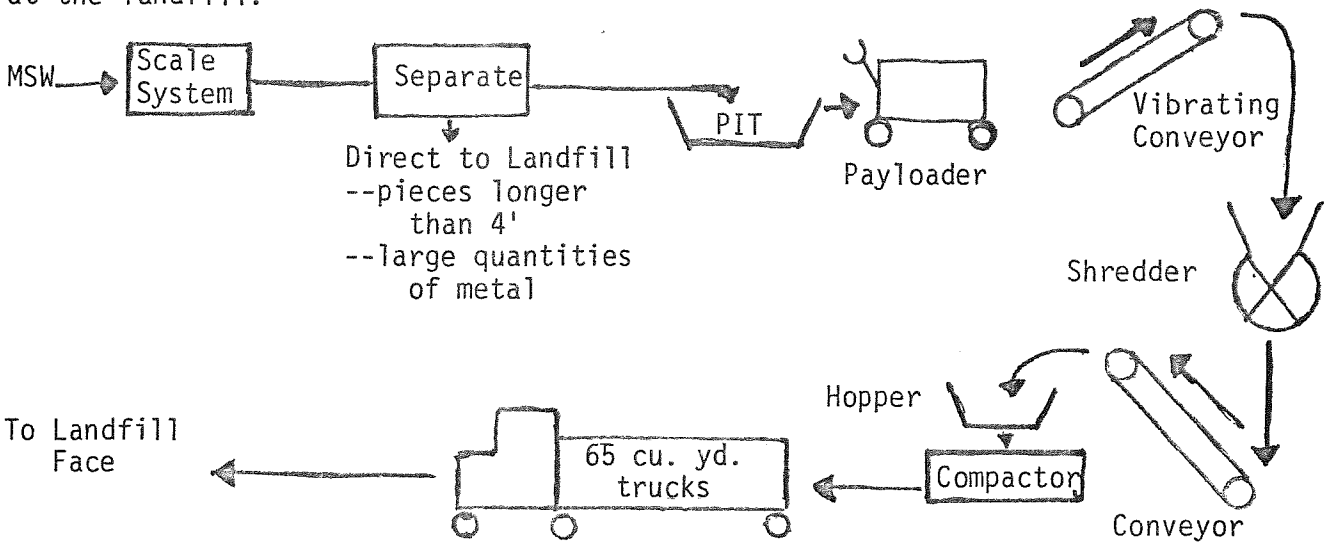
The size reduction is accomplished by processing the MSW through a machine that tears, cuts, or shatters the MSW. These machines are very power intensive requiring drive motors of 500-1,000 horsepower, thus the high electrical power costs.

The process flows generally follows one of these alternatives:



Each of the more complex steps has a corresponding increase in required investment, operating cost, and maintenance costs.

The flow schematic below details a system in use near High Point, North Carolina designed to shred waste for direct landfill. This unit is located at the landfill.



Information - 11 direct full-time personnel (1 is a full-time welder)
- Operating rate 40 tons/hour
- Downtime-45%
- Shredder drive motors 2-500 HP units

Costs $8-$10/ton

Pros

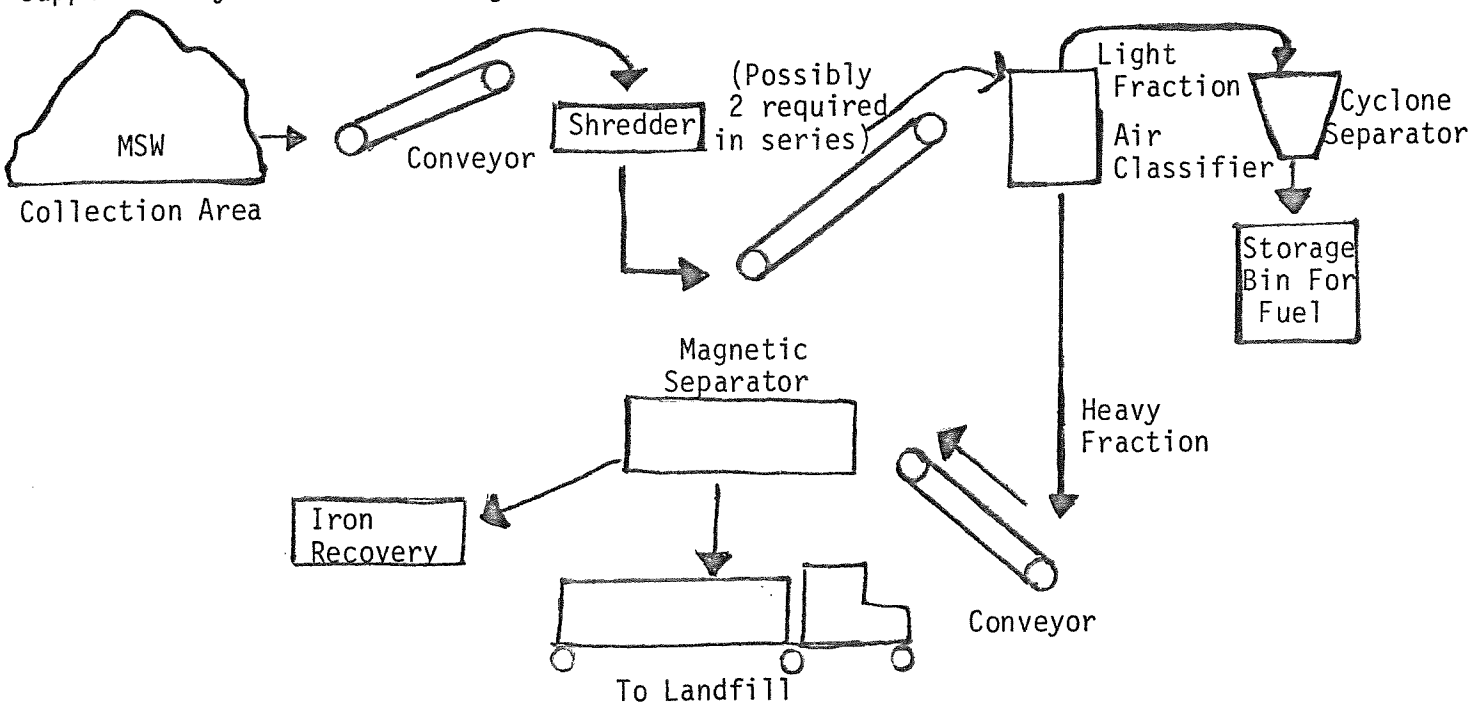
Shredded material handles easily and compacts easily
Possible saving on dirt cover requirements
Can add ferrous metal recovery and other technologies at future steps
Some volume reduction when compacted

Cons

Higher leachate rates into groundwater
High operating costs
High maintenance costs
Noise and safety considerations

Fire and explosions can occur in shredding operations. These can be adequately addressed in the design of the facility to assure adequate protection.

Shredding is a required initial step for many sophicated MSW disposal processes. A flow schematic outlined below could be utilized to provide a supplementary fuel for steam generation.



This schematic indicates the increased complexity of a MSW processing system when other than direct landfilling is planned.

Applicability of Shredding to Region "O" Needs

Shredding of MSW for direct landfill does not appear to be a viable alternate for Region "O" for solid waste disposal. The reduction in landfill requirements attained by shredding does not appear to warrant committing the investment and incurring the operating expenses associated with this activity.

Shredding would be justified if it is a necessary step associated with further processing and an end use for large portions of MSW such as in the preparation of a supplemental fuel for steam generation.

BURNING

Landfill requirements for MSW can be reduced significantly by burning. Volume reductions of the combustible portions of the MSW on the ninety percent range are attainable. There are three basic approaches to burning MSW.

1. Incineration
2. Incineration to recover energy in the form of steam or waste heat
3. Preparation of a Refuse Derived Fuel (RDF) that can be used as a supplemental fuel for large coal fired boilers

There are numerous variations available in each of these approaches. Some of the variations involve MSW preparation before burning, the consideration of recovery of saleable materials before burning, diverse types of combustion equipment and finally whether energy recovery from the burning process is to be attempted.

The investment, operating expenses and maintenance expenses associated with burning operation are higher than the expense of sanitary landfilling operation. The overall costs of those facilities for burning MSW that were reviewed by the Industrial Subcommittee were several times those associated with landfill operation in Region "0".

Incineration

Incineration is the controlled burning of solid liquid or gaseous waste. EPA studies indicate that reduction of 80 to 90 percent of the total volume of municipal solid waste is possible through incinceration. However, recent studies from a town in Florida show that a volume reduction of 97% is possible through the small modular incinerators. Most municipal solid waste can be burned in an incinerator except for large noncombustible items, such as washing machines, refrigerators, water heater tanks, stoves, etc. The volume conservation advantage of incineration plus sanitary landfilling of incineration residue and remaining waste over landfilling alone can be expected to be two to one. In other words an incinerator can double the life of a land disposal site.

This extension of landfill life becomes a significant factor as sites become more expensive, haul costs increase and as is the case in the coastal areas of

Region "O" where suitable sites are at a minimum because of the high water table.

Incinerators were divided into two classes for the purposes of the study--small package units with capacities of less than 50 tons per day and larger units, usually constructed at the incinerator site and capable of processing hundreds of tons per day.

The use of large incineration plants in Region "O" is not practical at this time. Excessive transfer station and haul costs would be incurred in order to consolidate sufficient wastes for a large plant. At the same time an excessive investment would be required to construct such a facility.

The use of small package incinerator systems is an alternate that could become economical for those portions of Region "O" unable to obtain adequate landfill sites and facing high haul costs.

Small incinerators are designed to burn unshredded MSW but it is necessary to remove material too large to enter the combustion chamber. The units are batch fed and the 24-hour cycle when burning one shift per day is:

Burn 7 to 8 hours
Burn out - 3 hours with auxiliary fuel
Cool overnight
Remove ash the next morning
Repeat the cycle

These units can be operated singly or grouped in the most cost effective manner. The characteristics of a 100 ton per day facility at Orlando, Florida are as follows:

8 incinerators--arranged 4 on each side of a building used to receive MSW
Staff - 9 people
Waste size - up to 4' long by 4" in diameter

1975 costs-operating--payroll	$107,000		
fuel	33,000		
utility	10,000		
all other	17,000		
	$167,000	or $6.26/ton	- financing $3.57/ton
Total	$9.83/ton plus landfill costs		

Facility cost in 1974 - $909,000
Vehicles - $25,000

Cost range of other incinerator facilities less finance charges - $8.50-$18.50/ton

Pros	Cons
Can add incremental modules for increased capacity Can add heat recovery Good volume reduction Can be placed strategically throughout the generating area	High disposal costs

Incineration to Recovery Energy

Resource recovery systems require large quantities of waste delivered for processing at one site in order to achieve economies of scale. For this reason, energy recovery appears feasible only in more densely populated urban and suburban areas within which it would be economical to haul large quantities of waste to a single location. The minimum amount of waste required for economical operation has not been determined, but the consensus of the solid waste engineering community is that 200-250 tons per day is the lower limit and that plants in the 500-2,000 ton per day range are likely to be the most economical. Current activity gives the best indication of practical plant size: of the systems currently being designed, constructed, or operated in the United States (excluding demonstration and test facilities), only three--those at Ames, Iowa (200 tons per day); Braintree, Massachusetts (240 tons); and Nashville, Tennessee (720 tons)--have capacities smaller than 1,000 tons per day.

The same factors limiting the installation of a large scale incinerator in Region "0" limit the economic feasibility of installing an incinerator capable of burning MSW and generating either heat or steam for use by a large consumer.

Refuse Derived Fuel (RDF)

MSW can be processed so as to yield a fuel suitable for use in total fired boilers. The reduction in landfill requirements associated with other incineration steps is attainable in producing RDF however, a series of processing steps required to obtain a satisfactory fuel. These are:

Primary Shredding
Air Classification
Storage

In addition to these steps and the facilities associated with them, special feed systems would be required to introduce the RDF to the boiler. RDF has a

low heat value when compared to coal. It is probable that the RDF content of the fuel fed to a high efficiency coal boiler cannot exceed 10-15 percent.

The economic feasibility of preparing RDF for use by a consumer can be ascertained only after a careful detailed study. It is a fair assumption that the economic incentive will not be significant at this time.

Pros	Cons
Reduced landfill requirements	Reduced flexibility of disposal of MSW
Energy recovery from MSW	Requires a facility that does not return a benefit if fuel is not burned

RESOURCE RECOVERY

Resource recovery is considered to be the ultimate in solid waste management. The easiest way to start such a program would be source separation of paper, cans, bottles and magazines. This, however, may amount to only about 10-15% of the material currently being landfilled. On the other hand it is a start in the right direction by extending the life of current landfills and at the same time begins to educate the citizens in some of the necessary changes which must be made in solid waste disposal.

The final steps in resource recovery must be made by incineration or pyrolysis, the former to obtain recovery of energy and the latter done in the absence of air to obtain a gaseous liquid and solid fuel. Energy and fuel recovery processes are inherently expensive, lack complete technological proveout and involve high maintenance costs when coupled with shredding operations. Most of the expensive plants being installed and started up during the early- to mid-1970's are in reality demonstration plants funded by federal grants and/or private industry and utilities.

Operational resource recovery systems in various locations of the nation are given in Table 8.

Energy locked up in the trash generated annually in the United States has been estimated at 900 trillion Btu. Can some of this energy be released by merely lighting a match to the nearly 300 million tons of total solid wastes produced? Of the 135 million tons of residential and commercial solid wastes generated in the U.S., 70-80% is combustible, having an average heat value of 4500 Btu/lb. If all this waste were converted to energy, theoretically 1.2 quadrillion Btu can be generated, an amount equal to an average of 564,000 barrels/ day of oil equivalent or 206 million barrels/year of oil equivalent.

In Europe, resource recovery plants have a history of success. In Frankfurt, Germany a resource recovery plant has been in operation since 1967. It has a 12,000 ton/day capacity (TPD) with electrical generation and steam for district heating. In Vienna, Austria a 600 TPD plant has been in operation since 1963 generating electricity and steam, and recovering ferrous scrap for resale.

TABLE 8

OPERATIONAL RESOURCE RECOVERY SYSTEMS[a]

Location	Process	Output	Status
Ames, Iowa	Baling; screening; other mechanical separation plus[b]	RDF[c] for use by utility; baled paper;[d]; and other non-magnetic metals	Operational
Baltimore, Maryland	Landgard® process: shredding, pyrolysis, water quenching, magnetic separation	Steam; magnetic metals; glassy aggregate	Shakedown stage--city only; Monsanto pulled out
Baltimore County, Maryland	[b]	RDF; glass for secondary products;[d]	Partially operational; fully operational by spring 1977
Brockton, Mass.	[b] plus other mechanical separation	Eco-Fuel® for industrial boiler; magnetic metals	Fuel is being made; presently testing
Chicago, Illinois	[b]	RDF for use by utility; magnetic metals	Operational
Franklin, Ohio	Hydrasposal™/Fibreclaim™ proprietary processes using wet pulping and magnetic separation; heavy media; jigging; electrostatic precipitation; optical sorting	Paper fibers; colorsorted glass; [d]	Operating since 1971
Milwaukee, Wisconsin	[b] plus other mechanical separation	RDF for use by utility; bundled paper and corrugated; glass concentrate;[d]	Shakedown phase; fully operational spring 1977
Nashville Tenness			
New Or L			

In Switzerland there are two resource recovery plants. Geneva's plant has been in operation since 1966, with 400 TPD capacity with electrical generation and hot water for industrial processing. In Berne, a plant has been operating since has been operating since 1954 with 200 TPD capacity.

Some U.S. installations of current interest include the 1,000 TPD pyrolysis plant in Baltimore, Maryland now undergoing final testing and shakedown. Key participants in this project are the City of Baltimore, Monsanto Envirochem Systems, Inc., and EPA. Heat recovery incinerators are being modified in Nashville, Tennessee to handle 720 TPD by Nashville Thermal Transfer Corporation and I.C. Thomasson & Associates, Inc. The 1,200 TPD Saugus, Mass. joint venture project of DeMatteo Construction and Wheelabrator-Frye (RESCO) was on line in 1975 with continuing construction and startup.

Fuels From Refuse

Solid, liquid and gaseous fuels can be produced from solid wastes via a number of methods now under study. Such fuels are intended as a supplement to fossil fuels. St. Louis, with a demonstration grant from EPA, is producing a shredded waste fuel supplement used in conjunction with coal in an existing Union Electric Company 125-MW suspension fired boiler. Union Electric announced a $70 million program to expand the demonstration project to serve the entire St. Louis metropolitan area (this has since been cancelled). Similar systems are being implemented by cities across the country including: Ames, Iowa; Bridgeport, Connecticut; Chicago, Illinois; Milwaukee, Wisconsin; and Monroe County, New York.

Pyrolysis systems are alternate methods being developed to convert solid wastes into liquid and gaseous fuels. In a pyrolysis system, thermal decomposition under oxygen starved conditions causes breakdown of solid wastes into: (1) gases consisting mainly of hydrogen, methane and carbon dioxide, (2) liquid organic chemicals which can be used as fuel such as acetone and methanol, and (3) pure carbon char, plus any glass, metal or inerts.

Linde Division, Union Carbide Corporation, is testing a 200 TPD vertical shaft pyrolysis furnace. Torrax Systems, Inc., Division of Carborundum Environmental Systems, Inc., has developed a system similar to Union Carbide's and is

constructing a 200 TDP plant in Luxembourg. A system combining pyrolysis with onsite burning of gaseous fuel produced and ferrous metal recovery is the Monsanto-Landgard system being demonstrated in Baltimore, Maryland.

Large scale resource recovery employs a variety of processes depending on the system design and its product goals. Table 9 summarizes some of the major U.S. projects in this area with principal unit processes involved, product output, capacity and latest available status of the project.

Pyrolysis

Pyrolysis systems which convert solid waste into gaseous or liquid fuels are being demonstrated with EPA solid waste demonstration grant support in Baltimore, Maryland, and San Diego County, California, and without Federal support in South Charleston, West Virginia (Table 9). These systems are expected to become fully operational during the 1977 to 1980 period.

TABLE 9

CAPITAL COSTS AND CAPACITY OF PYROLYSIS UNITS IN OPERATION OR UNDER CONSTRUCTION, 1975

Site	Energy product	Startup date	Total capital cost	Capacity (tons of waste per day)	Capital cost per ton of capacity
Baltimore, Maryland*	Steam	1975	$16,000,000	1,000	$16,000
South Charleston, West Virginia	Gaseous fuel	1974	?	200	?
San Diego County, California	Liquid fuel	1976	$ 9,600,000	200	$48,000

* EPA solid waste demonstration project

Pyrolysis is under development by nearly a score of different private and public organizations. The primary motivation is the desire to develop a system that can convert solid waste into a storable, transportable fuel--either liquid or gas.

The Garrett Research and Development Company's "Flash Pyrolysis" system, which will be demonstrated by EPA in San Diego County, California, will produce an oil-like liquid that will be used by the San Diego Gas and Electric Company as a supplemental fuel in an existing oil-fired boiler. The fuel has about 65% of the heating value of No. 6 fuel oil on a volumetric basis. In this system, mixed municipal solid waste is coarsely shredded and then separated by an air classifier into a light fraction and a heavy fraction. The light material is dried and reshredded to 1/16 of an inch before undergoing pyrolysis at a temperature of 900 F. Liquid fuel is produced at the rate of one barrel per ton of solid waste.

A gaseous fuel is being produced by the Union Carbide "Purox" system that is being tested at a 200-ton-per-day facility in South Charleston, West Virginia. The system is characterized by its slagging vertical shaft furnace, its use of pure oxygen rather than air, and the fact that it does not require shredding. The gas product is a clean burning fuel comparable to natural gas in combustion characteristics but with 30% of the heating value of natural gas. The gas produced is essentially free of sulfur compounds and nitrogen oxides and burns at approximately the same temperature as natural gas. This gas can be substituted for natural gas in an existing facility; the only plant modification necessary would be enlargement of the burner nozzle to increase the flow rate.

The new pyrolysis system being operated in Baltimore with EPA demonstration grant support combines a waste-heat boiler with the pyrolysis kiln to produce steam.

The plant, designed by Monsanto, uses the boiler to recover the heat value from the pyrolysis gases, which are combusted in an after burner separate from the kiln. When in full operation, 200,000 pounds of steam per hour will be recovered from processing 1,000 tons of solid waste per day. The steam will be transported by pipeline 3/4 of a mile to an existing steam distribution system that is operated by the local utility.

Marketing Considerations

The key to marketing energy from solid waste is to produce a form of energy that can be utilized without significant inconvenience to the user. A fuel product should be storable and transportable so that the solid waste facility can be built and operated independently of the fuel market.

Marketability of Fuels Derived from Solid Waste. Fuels derived from municipal solid waste have different physical and chemical properties than conventional fuels and thus have different handling and combustion characteristics. In analyzing the market potential for these fuels, some general factors which must be considered are:

- Quantity of fuel produced: enough of the product must be available to justify any expenses to the user in modifying his facility to accept the new fuel.
- Heating value: the heat value of each fuel must be high enough to minimize the effect of the fuel on the boiler or furnace efficiency. Also the costs of transporting, sorting, and handling the fuel will increase as the heat value decreases since greater tonnages or volumes must be handled to obtain the same amount of energy.
- Reliability: a high degree of reliability of the supply of the fuel will increase its value because the user will not have to maintain standby equipment or fuel.
- Particle size, ash content, and moisture content of shredded fuel: particles must be small enough to permit complete combustion when

burned in suspension. Ash content should be kept to a minimum so as to prevent erosion of the fuel firing system and the furnace walls, and reduce problems of handling fly and bottom ash. If the moisture content of the fuel is too high it will reduce the combustion efficiency of the boiler.

- Viscosity, volumetric heating value, chemical stability, and special handling requirements of liquid fuels.
- Heating value and transportability are prime considerations for gaseous fuels. The distance which gaseous fuels can be economically transported is limited by the cost of compressing and pumping the gas.

Marketability of Steam or Electricity. Steam and electricity derived from waste can both be used without significant inconvenience to the user, but there are constraints which must be considered. For steam distribution systems these include:

- Proximity to customer: the facility must be located close to the steam market. Generally steam can be transported only about 2 miles; in congested areas, extensive piping may further restrict this distance.
- Value: the price of the steam delivered to customers must be competitive with alternative energy sources.
- Quantity: the amount of steam must be sufficient to serve customers' needs, allowing for peak demand periods. Otherwise, standby provisions must be available.
- Operating schedule: steam generation facility must operate on a schedule consistent with the customers' operating schedules.
- Availability of waste: sufficient waste must be assured to meet steam output commitment.
- Steam quality: temperature and pressure of steam produced must be consistent with optimal performance of steam generating plant and the limits acceptable to the customer.
- Reliability: contingency plans must be available in case solid waste flow is impeded.

- Disposal option: should the facility fail to operate, either technically or economically (e.g., depressed steam market), disposal of solid waste must still be provided for. Condensing units or a backup landfill may be necessary.
- Timing: steam must be available when needed and upon demand. Also, unanticipated delays in construction of the facility may divert potential customers to alternative commitments.

The marketability considerations for solid-waste-to-electricity systems are basically the same as those for steam systems, since steam production is usually the interim step in generating electricity. However, electricity systems are not limited by the need for proximity to the customer or steam quality considerations.

Market Opportunities. Markets for solid-waste-derived fuels are likely to be large utilities or industrial users who could supplement conventional fuels with solid waste fuel. Major industrial operations such as cement plants, steelmills, papermills, etc., and district heating/cooling plants are also potential market outlets. Market opportunities for steam similarly include metropolitan areas with commercial and campus district heating and cooling networks and industrial plants which operate steam-electric powerplants.

The major concern in marketing electricity is that it can be marketed only to the electric utility serving the area because, within that service area, the utility is generally exempt from competition. The only exception to that would be a municipally owned utility, but only a small fraction of the nation's electricity-generating capacity falls in this category.

Resource Recovery Plant Success Factors

The decision to build a resource recovery plant must be based on a thorough

analysis of local conditions. However, a thorough analysis is costly and time consuming, and decision-makers need to have a rough idea about the feasibility of resource recovery before undertaking such a study. It is possible to make a superficial but meaningful assessment of feasibility by considering a few factors that are basic to the success of a resource recovery system.

Economies of Scale

Resource recovery systems require large quantities of waste delivered for processing at one site in order to achieve economies of scale. For this reason, resource recovery appears feasible only in more densely populated urban and suburban areas within which it would be economical to haul large quantities of waste to a single location. The minimum amount of waste required for economical operation has not been determined, but the consensus of the solid waste engineering community is that 200 to 250 tons per day is the lower limit and that plants in the 500- to 2,000-ton-per-day range are likely to be the most economical size. Current activity gives the best indication of practical plant size: of the systems currently being designed, constructed, or operated in the United States (excluding demonstration and test facilities), only three--those at Ames, Iowa (200 tons per day); Braintree, Massachusetts (240 tons); and Nashville, Tennessee (720 tons)--have capacities smaller than 1,000 tons per day.

Advantages and Disadvantages of Energy Recovery

Advantages

In addition to easing energy shortages, energy recovery offers the following advantages over conventional waste management methods:

- Landfill requirements can be reduced. The present landfill can be used longer, and the task of finding the next landfill site will be less urgent.

- Finding a site for an energy recovery plant may be easier than finding a site for a landfill or conventional incinerator.
- Energy recovery is environmentally preferable because total population is reduced when compared to a system that includes incineration for solid waste disposal and burning fossil fuels energy.
- Public opinion favors energy recovery. Many communities are opposing new solid waste management ventures unless they include resource recovery. Some communities have even said that they would pay more for resource recovery because of its environmental benefits.
- Energy recovery appears to be more economical than environmentally sound conventional incineration or remote sanitary landfilling.
- The future prospects for favorable economic justification for energy recovery are very good because of the soaring costs of fossil fuels and increasing environmental constraints being placed on other alternatives for solid waste disposal.
- Most energy recovery systems facilitate the recovery of materials for recycling.

Disadvantages and Risks

- Most systems will not accept all types of wastes and will produce some residues. Therefore a sanitary landfill will still be needed as a part of the total system.
- Developmental work is still underway on many of the energy recovery options.
- The municipality will have to market recovered products or hire a private company to do this. This is a new task for most municipalities, requiring special skills and possibly changes in municipal regulations.
- Specific needs of the energy market may dictate parameters of the system design. This could include type of facility, size of site location, or operating hours.
- Most energy recovery systems require raising large sums of investment capital.

TABLE 10 *

ESTIMATES OF THE POTENTIAL GROSS REVENUES FOR MATERIALS RECOVERED FROM A TON OF MUNICIPAL SOLID WASTE IN A MECHANICAL PROCESSING FACILITY

Product	Percent in total waste input**	Percent recovered	Recovery as percent of total waste input	Estimated gross price per ton***	Approximate potential gross revenue per ton of solid waste
Glass	9.9	70	6.93	$16	$1.10
Ferrous metal	8.2	95	7.80	50	3.90
Aluminum	0.7	60	0.42	300	1.26
Other nonferrous metal	0.3	80	0.24	350	.84
Total	19.1	--	15.39	--	$7.10

* Decision-makers Guide in Solid Waste Management

** Based on national average composition

*** Excludes costs of transporting to markets. Transport costs could significantly reduce the net revenue from glass and ferrous metal.

Conclusions

The recovery of energy from solid waste can create mutual benefits for the community and the purchasers of the energy product. Some benefits may be expressed in dollars, others may not. For example, the community may benefit from lower waste disposal costs, less air pollution, and longer landfill life. At the same time, the energy user can benefit from lower fuel costs, a reliable source of low-sulfur fuel, and an opportunity to provide a community service.

If a community wishes to implement a resource recovery system, it must consider both the markets and the technologies that are available. If the decision must be made now, waterwall incineration or the use of shredded solid waste as a supplementary fuel should be considered, recognizing that there are still economic uncertainties inherent in solid waste fuel systems. If a community has a year or so to make the decision about building a system, it should delay the decision until then because by that time the degree of economic viability of solid waste fuel systems should be much clearer. If the decision-making time is from 2 to 5 years away, oil or gas pyrolysis should also command major emphasis in the community's planning, for these systems should be fully demonstrated during this time. It should be remembered, however, that the time between system selection and actual operation--the time for procurement, design, construction, and shakedown operations--could conceivably be as long as 5 years. This must be considered when determining the lead time available for decision-making.

RESOURCE RECOVERY STATUS

TABLE 11

LOCATION	PROCESSES EMPLOYED								OUTPUT								CAP'TY TPD	STATUS REPORTED
	Shredding	Air Classification	Magnetic Separation	Mechanical Separation	Incineration	Anerobic Digestion	Pyrolysis	Other	Utility Boiler (Steam)	Magnetic Metals	Nonferrous Metals	Paper	Glass	Fuel Gas	Oil	Other Fuel		
Akron, Ohio	●	●	●		●					●						●	1000	Under construction
Ames, Iowa	●	●	●	●						●	●	●	●			●	200	Operational 1975
Baltimore, Md.	●		●				●		●	●			●				1000	Operational
Berlin, Conn.									●								1800-2200	Planning
Beverley, Mass.									●								500-1000	Planning
Bridgeport, Conn.	●	●		●					●	●	●		●				1500	Scheduled late 1977
Chicago, Ill.	●	●	●							●						●	1000	Under construction
Cleveland, Ohio									●	●							1800-2000	Planning
Cuyahoga Valley, Ohio			●		●				●	●							2000	Engineering
State of Delaware	●	●	●	●		●	●										750	Planning
East Bridgewater, Mass.	●	●	●	●												●	500	Startup operations
Franklin, Ohio			●					●		●		●					50	Operation
Knoxville, Tenn.-TVA									●	●	●						3000	Planning
Milwaukee, Wis.	●	●	●							●		●				●	1200-1600	Planning
Nashville, Tenn.					●				●								720	Operational
New Orleans, La.	●	●	●	●						●	●	●	●				650	Under construction
Pompano Beach, Fla.						●								●			50-100	Engineering
Rochester, N.Y.	●	●	●	●					●	●	●						2000	Planning-Engineering
St. Louis, Mo.	●	●	●	●					●	●							8000	Planning & Operational
San Diego, Calif.	●	●	●	●			●			●			●		●		—	Construction
Saugus, Mass.			●		●				●	●							1200	Operational
Scranton, Pa.	●	●	●	●					●	●	●						600	Planning
South Charleston, W. Va.	●						●							●			200	Demonstration plant

SOURCES CONSULTED

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C.7

New Hanover

OTR

DRAFT
June 10, 1977

Ms. Cecelia H. Pleasants
2310 Camellia Drive
Wilmington, NC

Dear Ms. Pleasants:

In your letter of May 17, 1977, you raised several questions concerning the interim guidelines for the identification of regions and agencies for solid waste management as required by the Resource Conservation and Recovery Act of 1976. Sub-Section 255.20, Preliminary Identification of Regions, contains the provision "where the regional identification has already been established by state legislation or other method in keeping with these guidelines this notification need only request comments on the existing arrangement". Presently, there is no established need to change the regional boundaries as created by Executive Order No. 3 dated May 7, 1970.

The lead agency for the Wilmington area is the Cape Fear Council of Governments. The Chairman is Mr. Claude O'Shields, Jr., Commissioner, New Hanover County, 5604 Market Street, Wilmington, North Carolina 28401.

In regard to solid waste planning, the North Carolina Department of Human Resources is designated as the State agency responsible for the development and implementation of a State Plan. The current State Plan recognizes the county unit of government as the basic planning unit for overall solid waste management activities. This approach recognizes that each county and its constituent parts have disposal needs which can be met on an economical and feasible basis. It also recognizes that funding for such systems is provided by the county unit of government and its constituent parts. Local units of government also have flexibility for entering into contractual agreements for solid waste management activities. Future State Plans will in all likelihood contain similar approaches for solid waste management on a functional and feasible basis.

To Ed Regan - 6/15/77

Specialty areas of solid waste management such as resource recovery and recycling efforts or possibilities for refuse derived fuel can be explored on a regional basis provided regional boundaries do not serve as restrictions to the flow of waste materials needed to support such systems.

Special waste problems such as those currently being surveyed by the Department of Human Resources are best explored at the State level due to the complexity of the problems and their consequent solutions.

I trust that your concerns are satisfied with the above information.

Sincerely,

James B. Hunt, Jr.

JCP:bm

APPROVED James T. Stamey for
Marshall Staton, Chief
Sanitary Engineering Section

NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

ROUTING SLIP

DATE 6/6/77

TO Marshall Staton

FROM Don

- [ ] For your information
- [ ] Keep
- [ ] Return
- [ ] File
- [ ] For your signature
- [ ] For your approval
- [ ] Note and see me about this
- [ ] Prepare a reply
  - [ ] Your signature
  - [ ] My signature
  - [ ] Send me a copy of reply
- [ ] Your comments
- [x] Take charge of this
- [ ] Attach requested information
- [ ] Initial and route to

Remarks:

Thank you

RECEIVED
JUN 6 1977
SANITARY ENGINEERING SECTION

Executive Order Number 3, dated May 7, 1970.

DHR Form 3 rev. (8/75)

DEPARTMENT OF ADMINISTRATION

POLICY DEVELOPMENT DIVISION 4131

Dr. Levine;

Could someone on your staff please draft a response for Gov's. signature? Please return draft of letter to me by 6/10 if possible.

Thank You

Ed Regan

RECEIVED

JUN 6 1977

ASS'T. DIRECTOR FOR
STATE SERVICES
DIVISION OF HEALTH SERVICES

___ % ELECTED OFFICIALS

___ AT LARGE

___

2310 Camellia Drive
Wilmington, N. C.
May 17, 1977

The Honorable James Hunt
Governor of North Carolina
Raleigh, North Carolina 27611

Dear Sir:

I have an interest in the "lead agency" you plan to designate to manage the identification process specified in Title 40, Part 225, Sub Section 255.23 "Joint Identification of Agencies." It is my understanding that this agency is responsible for Identification of Regions and Agencies for Solid Waste Management for the Environmental Protection Agency as published in their interim guidelines in the Federal Register, Monday, May 16, 1977. It is also my understanding that the overall objectives of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (Pub. L 94-580, 42 USC 6901 et seq.) are to promote the protection of health and the environment and to conserve material and energy resources in part by establishing a cooperative effort toward improved solid wast management among the Federal, State, and local governments and private enterprise.

If a "lead agency" currently exists in North Carolina, I would like the address and names of those who serve on any advisory committees. I realize that "COG" cannot serve in any capacity other than a review in accordance with Circular Letter A-95 from OMB, for purposes of planning a facility once the need is established. I am interested in the "lead agency" selection process for the establishment of need for Solid and Waste Water treatment facilities and where that "lead agency" receives its financial support.

I would appreciate a response.

Yours very truly,

Cecelia H. Pleasants

Cecelia H. Pleasants

RECEIVED
MAY 18 1977
GOVERNOR'S OFFICE

New Hanover
LVR

October 26, 1976

Mr. W. D. Merritt
2016 Barnett Avenue
Wilmington, NC 28401

Dear Mr. Merritt:

By copy of this letter, we are requesting Mr. Fred J. Wood, District Sanitarian, to investigate the conditions you described in your letter concerning garbage and trash next to your home. Mr. Wood will contact you at the time of his investigation.

If this office can be of further assistance in this matter, please let us know.

Very truly yours,

Sidney H. Usry, Head
Solid Waste & Vector Control Branch
Sanitary Engineering Section

bm
cc: Mr. Fred J. Wood

2016 Barnett Ave
Wilmington NC
28401

State Board of Health
Raleigh NC -

OCT 25 1976
RECEIVED
OCT 26 1976
SANITARY ENGINEERING SECTION

Dear Sir:
I have been a resident at 2016 Barnett Ave Wilmington NC for numerous years. For the past year neighbors have moved beside me who are very unsanitary - and I am concerned about the health hazards that conditions may cause. Garbage & trash accumulated that is not disposed of for weeks - I have contacted the local Health Department twice & they had the trash removed but after that the trash

is still there.
Cannot something permanent
be done about this
condition for the health
safety of my family
and neighbors.

Thanking you I remain

W. H. Merritt

New Hanover
ER

CAPE FEAR COUNCIL OF GOVERNMENTS
POST OFFICE BOX 1491
SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

Serving Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

Telephone: (919) 763-0191

October 14, 1976

RECEIVED
OCT 18 1976
SANITARY ENGINEERING SECTION

MEMORANDUM

TO: Solid Waste Industrial Subcommittee Members

FROM: William B. Smalley, Chairman WBS/urt

SUBJECT: October 6, 1976, SWIS Meeting Summary

MEMBERS PRESENT

James T. Bradley	Singer Company
Frank B. Guenzel	Diamond Shamrock
John Humphrey	Hercofina
James Kutrow	Babcock and Wilcox
Harry Morgan	Fort Fisher Air Force Base
R. J. Novak	Carolina Power and Light Company
W. B. Smalley, Chairman	General Electric Company
William J. Stenger	E. I. Dupont de Nemours Company
H. E. Vance	Timme Corporation
Marshall White	Federal Paperboard Company
H. P. Woodard, Jr.	Southern Bell Telephone & Telegraph Company

CAPE FEAR COUNCIL OF GOVERNMENTS STAFF PRESENT

William T. Reilly	Project Coordinator

OTHERS PRESENT:

Daniel W. Eller	New Hanover County Manager

Chairman Smalley reviewed the Regional Solid Waste Inventory. Solid waste generation is approximately 540 tons/day. The bulk of the wastes is disposed of in two areas. Flemington disposes of about 300 tons/day. Whiteville disposes of 120 tons/day. In contrast, the industrial generation is 1500 tons/day. Half of this is disposed on private sites, but some sites are approaching capacity. Thirty percent is burned on site.

At the last meeting we discussed source separation and arrived at the following general conclusions pertaining to MSW, a source separation program:

1. would not significantly reduce landfill requirements
2. reductions obtained would be cost effective
3. both economic and regulatory incentives should be considered to encourage source separation
4. the program developed should not depend on a voluntary effort
5. consideration should be given to a pilot program in both rural and urban areas to "debug" any proposed source separation program.

Bill Reilly advised that copies of the Five-Year Landfill Disposal Plan will be released shortly and copies to be given to SWIS members. This plan emphasises proper determination of costs to establish these as the ground work for future feasibility studies for other methods of disposal, including burning, resource, and energy recovery.

Chairman Smalley introduced the topic of shredding with a description of the High Point shredder installation. The processing steps are: scale system, discharge to pit, feed to shredder system with payloader, feed conveyor, shredder, discharge conveyor, compactor, and trailer transport to landfill. The highlights of the operation are as follows:

1. Nominal capacity -- 40 tons/hour
2. Unit shreds 32-44 tons/hour while operating
3. Downtime - 45%
4. Shredder drive horsepower - 1000
5. Particle size 3"-5"
6. Open, unsheltered system
7. Synopsis of last three months of operating history
   - 39 days - significant feed interruptions
   - 5 days - significant discharge interruptions
   - 15 days - significant mechanical disruptions
   - 1 - explosion
   - 1 - fire
8. Initial cost - $800,000
9. Supplemental equipment - $300,000
10. Unit is labor intensive
11. Unit has a high maintenance

The shredder employs eleven persons, listed as follows:

- 1 - scale man
- 1 - clerk
- 1 - shredder operator
- 1 - pit loader
- 1 - backup for pit loader and shredder operator
- 2 - trailer drivers
- 1 - welder
- 3 - labours

ADVANTAGES: fill compacts easily, full spreads easily, saves on landfill requirements by providing densification of solid waste and reducing dirt fill requirements, covering each night is not required.

DISADVANTAGES: high maintenance cost, two units would be required to provide 100% operating capabilities, leachate generates more contamination, wastes will burn.

General conclusions were:

1. Any recommendation for shredding would include emphasis on development of accurate operating expense information.
2. Any evaluation of shredding should include a careful assessment of gain in waste density by shredding versus gain in waste density by various compaction methods.
3. We need more information as to suitability of shredding for this region's needs, particularly benefits of shredding if it is not coupled with resource recovery.

Chairman Smalley proposed recommendations for achieving a summary report by the end of the first quarter of next year. We are lacking in survey and data-gathering capacity. Organizing into small groups to look at specific segments: 1) machine reduction; 2) burning--incineration for steam, fuel supplement, 3) resource recovery, and 4) economics was proposed, in order to increase this capacity. It was decided that economic planning must be included in all processes and that the committee would volunteer for categories or assignments by the chair. Members requested assignments to categories as follows:

Category and Member Choices

Machine Reduction	Burning	Resource Recovery
Frank Guenzel	W. J. Stenger	John K. Humphrey
Harry Morgan	Pat Woodard	James Bradley
William B. Smalley	Harley Vance	Marshall White
	Robert Novak	
	James Kutrow	

General Discussion

Bob Novak reviewed portions of the regional solid waste derived fuel report. He commented that TVA went through secondary and tertiary shredding. A need was shown to separate ferrous, non-ferrous, and glass. He briefly commented on conversion to methanol. Findings of the study were:

1. collection and transportation cost in a regional resource recovery system were one-fifth to one-third of total cost
2. optimum waste supply would be 2000-3000 tons/day
3. processing should be located close to the assembly point.

Income per ton of waste into boiler fuel would have to range from $7 to $17 per ton. The exact price would be dependent on volume and degree of processing involved to break even.

Other discussion comments were as follows: I believe we skipped waste handling step one--better compaction at the landfill. There are compactors that compact forty percent more than compacted at Flemington--we should proceed to

shredding, then metals separation--since New Hanover County area is of minimum size, we need to get the waste volume down by better compaction--much of the downtime in the High Point shredder operation is attributed to the bins being full--shredding and compaction are coming to a matter of economics, but this is the first step.

The next meeting is scheduled for 2:00 p.m., Wednesday, November 3, 1976, at Cape Fear Technical Institute.

WBS/ceb

cc: Solid Waste Planning Management Committee

bcc: W. J. Usury
✓Marshall Staton
Odell Strickland
Alan Rimer
Charles Baker
Lanier Hickman

✓ New Hanover

CAPE FEAR COUNCIL OF GOVERNMENTS

POST OFFICE BOX 1491
SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

Serving Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

Telephone: (919) 763-0191

October 14, 1976

RECEIVED
JUN 10 1977
SOLID WASTE-VECTOR CONTROL

Mr. S. H. Usry
Solid Waste & Vector Control
Branch Head
Department of Human Resources
Division of Health Services
306 N. Wilmington Street
Bath Building
Raleigh, N. C.

Dear Mr. Usry:

As we promised in a letter to Mr. Odell Strickland on September 23, we are enclosing a copy of the Five-Year Solid Waste Management Plan for North Carolina Planning Region "O." This five-year plan is regarded as an interim plan for landfill disposal during a period when technology will cause changes and shifts in disposal methods.

A long-term plan is under development by the Cape Fear Council of Governments Solid Waste Industrial Subcommittee (members listed on page ii of the report).

Chapter IX is a summary on Energy Resource Recovery, and on page 90 of the Appendix is the initial report of the Solid Waste Industrial Subcommittee on resource/energy recovery. As we indicated to Mr. Strickland in our September 23rd letter, the Solid Waste Industrial Subcommittee is continuing to study these subjects. Therefore, we look to the state for future assistance, as the direction of future technology becomes clear.

We will appreciate your review of this report, especially as related to the section on resource and energy recovery. Please advise.

Mr. Jerry Perkins, Branch Head
Solid Waste & Vector Control
Sanitary Eng. Section, Div. Health Serv.
Dept. Human Resources
306 N. Wilmington St.
Raleigh, N.C.

Sincerely,

William T. Reilly

William T. Reilly
Regional Planning Director

WTR/bb
Enclosure

cc: Odell Strickland
Marshall Staton

Dear Jerry,
As far as I can tell, no response to the comments was received by us.
Sincerely,
Bill Reilly

SCW

September 23, 1976

RECEIVED
JUN 10 1977
SOLID WASTE-VECTOR CONTROL

Mr. Odell W. Strickland
Solid Waste & Vector Control Branch
Division of Health Services
N. C. Department of Human Resources
Raleigh, N. C.

Dear Mr. Strickland:

It has been some time since you were over to review our progress in the development of a Solid Waste Management Plan for the Cape Fear Region.

As you remember, we are developing a five-year plan for landfill disposal operations, while simultaneously the Solid Waste Industrial Subcommittee is studying long-term recovery. We have completed a five-year plan, and I look forward to sending a copy for your comments as soon as it is printed. We appreciate your participation and assistance in the development of our plan.

Also, enclosed is a copy of the program schedule for the next three meetings of the SWIS. Should you have any interest in these meetings, we will be happy to have you as our guest.

The SWIS will continue to explore the subject of resource and energy recovery for the next nine months, and we will welcome any contribution that the State may wish to make.

Sincerely,

William T. Reilly
Regional Planning Director

WTR/bb
Enclosure

cc: Chief, Sanitary Engineering Section
Robert W. Sawyer
Robert F. Coleman

no response

New Hanover

CAPE FEAR COUNCIL OF GOVERNMENTS

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SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

Serving Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

Telephone: (919) 763-0191

RECEIVED
SEP 27 1976
SOLID WASTE SECTION

September 23, 1976

Mr. Odell W. Strickland
Solid Waste & Vector Control Branch
Division of Health Services
N. C. Department of Human Resources
Raleigh, N. C.

Dear Mr. Strickland:

It has been some time since you were over to review our progress in the development of a Solid Waste Management Plan for the Cape Fear Region.

As you remember, we are developing a five-year plan for landfill disposal operations, while simultaneously the Solid Waste Industrial Subcommittee is studying long-term recovery. We have completed a five-year plan, and I look forward to sending a copy for your comments as soon as it is printed. We appreciate your participation and assistance in the development of our plan.

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Sincerely,

William T. Reilly
Regional Planning Director

WTR/bb
Enclosure

cc: Chief, Sanitary Engineering Section
Robert W. Sawyer
Robert F. Coleman

CAPE FEAR COUNCIL OF GOVERNMENTS
POST OFFICE BOX 1491
SUITE 206 1 NORTH THIRD
WILMINGTON, N. C. 28401

INFORMATION COPY

Serving Local Government in the North Carolina Counties of Brunswick, Columbus, New Hanover and Pender

Telephone: (919) 763-0191

RECEIVED

September 22, 1976

BULLETIN

TO: Solid Waste Industrial Subcommitte Members (SWIS)

FROM: William B. Smalley, Chairman

SUBJECT: SWIS, Study Status

We haven't been forgotten or disbanded. I have been getting information located and available for us to act on before scheduling a meeting.

INFORMATION STATUS:

1. Report on operations coming from High Point, N. C. They have been operating a shredder for two years with good results -i.e. 40% reduction in volume. Will distribute this to you as soon as I get it.

2. Bill Reilly is getting a comprehensive report on the feasibility of resource recovery from a project in the Denver Area by the Denver Council of Government.

3. Harry Morgan - Fort Fisher is getting available information from Federal Facility Sources.

4. National Center for Resource Recovery, Washington, D. C. sending their available information and information on the scope of their activity.

MEETING SCHEDULE

TOPIC	TIME	PLACE
Shredding	2 p.m. 10/6/76	CFTI Board Room
Incineration/Steam Generation	2 p.m. 11/3/76	CFTI Board Room
Pyrolysis and General Assessment of Findings	2 p.m. 12/1/76	CFTI Board Room

BULLETIN
Solid Waste Industrial Subcommitte Members
September 22, 1976

Plan past this point is to consolidate findings into summary report to Cape Fear Council of Governments with recommendations.

General assessment of findings will probably take a second meeting. Would plan to have a person knowledgeable in the total cycle present at one of these two general meetings.

William B. Smalley, Chairman

William T. Reilly
For the Chairman

WBS/map

New Hanover

I+R

August 12, 1976

Mr. J. R. Ross
Plant Manager
Hercules, Inc.
Synthetics Department
Post Office Box 327
Wilmington, NC 28401

Dear Mr. Ross:

Your letter of August 2, 1976, in reference to the disposal of DMT, addressed to Mr. Fred Wood, has been forwarded to this office for reply.

I have discussed the chemical analysis of DMT with Dr. R. J. Drye, Head, Environmental Sciences, Laboratory Section, Division of Health Services.

This office has no objection to the placing of this waste in an approved sanitary landfill provided it is dry. Dry is defined as being without free moisture.

Sincerely,

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS:bm
cc: Mr. Fred J. Wood

HERCULES INCORPORATED

SYNTHETICS DEPARTMENT · P. O. BOX 327, WILMINGTON, NORTH CAROLINA 28401

August 2, 1976

RECEIVED
AUG 9 1976
WASTE-VECTOR CONTROL

Mr. Fred Wood
North Carolina Health Department
404 St. Andrews Drive
Greenville, North Carolina 27834

Dear Mr. Wood:

As per our telephone conversation, please find below the information you requested.

Circumstances for dumping - Spilled material contaminated beyond economical recovery.

Volume per week or month - One (1) ton per week.

Chemical analysis of DMT - Attached.

If you should desire any further information, please feel free to call on us.

Very truly yours,

J. R. Ross
Plant Manager

BY Barbara W. Larkins
Barbara W. Larkins
Purchasing Agent

BWL/pb

Attachment

cc: Mr. J. R. Ross
Mr. J. R. Rouse

HERCULES INCORPORATED

MEDICAL DEPARTMENT

cc: H. H. Haggard - Syn. ✓
(Enc.)

DMT
Final

Wilmington, Delaware
September 15, 1975

TO: L. V. Peiffer - Syn.

FROM: E. E. Christofano - Medical

The attached report on animal experiments using DMT and TPA appeared in the August issue of the American Industrial Hygiene Association. The authors conclude from these radio tracer studies that both DMT and TPA are rapidly absorbed and excreted. No significant quantities of the test materials were accumulated in the animals studied.

The rapid absorption, excretion and lack of tissue retention of TPA and DMT indicate these materials do not present a significant industrial health problem to exposed workers.

EEC

EEC:lcc
Attach.

RECEIVED
AUG 9 1976
WASTE-VECTOR CONTROL

Absorption, Distribution and Excretion of Terephthalic Acid and Dimethyl Terephthalate

A. E. MOFFITT, JR., Sc.D.*, J. J. CLARY, Ph.D.**, T. R. LEWIS, Ph.D., M. D. BLANCK, M.S., and V. B. PERONE

United States Department of Health, Education and Welfare, Center for Disease Control, National Institute for Occupational Safety and Health, Toxicology Branch, Cincinnati, Ohio 45202

Data from a radiotracer study in rabbits and rats to determine the absorption, distribution, and excretion of terephthalic acid (TA) and dimethyl terephthalate (DMT) following oral, intratracheal, dermal and ocular administration indicate the following: (1) a rapid absorption and excretion of ^{14}C-TA and ^{14}C-DMT with no evidence of tissue accumulation in rats following single or repeated oral and intratracheal administration; (2) no evidence of skin irritation in rats after a single or repeated dermal application of 80 mg of ^{14}C-TA or ^{14}C-DMT and no significant skin absorption of ^{14}C-TA; (3) recovery of approximately 11% of a single dose and 13% of five repeated cutaneous doses of ^{14}C-DMT from the urine and feces of rats within 10 days after initial dosing; (4) no significant absorption of ^{14}C-TA when applied to the conjunctival sac of one eye of eight rabbits; (5) exretion of approximately 33% of a single ocular dose (50 mg) of ^{14}C-DMT in the urine and feces of rabbits within 10 days after instillation with no evidence of tissue accumulation or ocular damage. These results suggest that TA and DMT are rapidly absorbed and excreted and that no significant quantities of these compounds accumulate in the tissues following single or repeated oral, intratracheal, dermal, or ocular administration to laboratory animals.

Introduction

TEREPHTHALIC ACID (TA, also p-phthalic acid; p-benzenedicarboxylic acid) and its dimethyl ester, dimethyl terephthalate (DMT) (Figure 1), are used extensively in industry in the production of linear crystalline polyester resins, films, and fibers because of their high melting point, thermal stability, low volatility, and low aqueous solubility.[1-3] The principal physical and chemical properties of TA and DMT are presented in Table I. Small amounts of these chemicals are also used as intermediates in adhesive formulations, herbicide production, printing inks, coatings, and paints.[1-3] TA is frequently used in certain animal feed supplements to enhance the physical properties

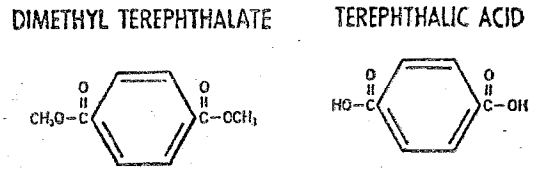

Figure 1. Structural formulas for dimethyl terephthalate (DMT) and terephthalic acid (TA).

of the feed and to increase the bioavailability of such added components as antibiotics.[4,5] Ota[6] has demonstrated that TA also increases histamine absorption in the large intestine. In 1970 more than 0.4×10^9 lb of TA were produced in this country and it is predicted that 2.9×10^9 lb will be manufactured by 1979.[7] A recent listing of the top fifty U. S. chemicals on a 1973 tonnage production basis ranked DMT thirty-first at 2.7×10^9 lb and TA thirty-third at 2.5×10^9 lb.[8]

In extensive screening studies of the toxicity of TA and DMT conducted by the Laboratory of Industrial Medicine, Eastman

*Present address: Senior Environmental Chemist and Toxicologist, Bethlehem Steel Corporation, Bethlehem, Pennsylvania 18016.

**Present address: Toxicologist, Haskell Laboratories, E. I. du Pont de Nemours and Company, Elkton Road, Newark, Delaware 19711.

TABLE I
Physical and Chemical Properties of Terephthalic Acid and Dimethyl Terephthalate

Properties	TA	DMT
Form	White Crystals or Powder	Colorless Crystals
Molecular Weight	166.13	194.18
Density, g/ml	1.51	1.07
Melting Point, °C	—	140
Sublimation Point, °C	402	>300
Vapor Pressure, mm Hg	0.5 at 120°C	10 at 141°C
H_2O Solubility at 25°C	Ins., 0.0019 g/100 ml	Ins.
Solubility in Solvents		
—Chloroform	V. sl. sol.	Sol.
—Ether	V. sl. sol.	Sol.
—Alcohol	V. sl. sol.	Sol. (Hot)
Solubility in Alkalies	Sol.	Sol.
Relative Explosion Hazard	Severe	Severe

Kodak Company, TA was found to have a low order of acute toxicity with no evidence of skin sensitization or absorption.[2] Radiolabeled chemicals, however, were not employed to assess the absorption of TA. The approximate acute oral LD_{50} of TA in mice is 6400 mg/kg, but this level produced no mortality in rats.[2,9] Intraperitoneal doses of TA killed mice at 800 mg/kg and rats at 1600 mg/kg with deaths delayed up to 48 hours.[2] TA caused slight irritation of the conjunctiva of the eye, but caused no corneal damage when applied in small doses to the conjunctival sacs of rabbits.[2]

In studies conducted by Kono and Nakajima,[10] prolonged feeding of 0.5% and 1.0% TA caused nephrosis, atrophy, and other structural changes in the kidneys of chickens. On the basis of these studies, it was suggested that the dosage of TA as a feed additive be kept below 0.4%[10]

DMT also has a low acute oral toxicity with no evidence of skin absorption, irritation, or sensitization.[3,11] Feeding 5% DMT in the diet of rats for 28 days caused loss of weight, reduced food consumption, and resulted in high mortality.[1,9] In recent studies by Krasavage et al,[11] rats ingesting 1% in the diet for 96 days showed reductions in body weight gain and diet efficiency, but no adverse effects on blood chemistry or cellular components. Dose levels of 0.5% and 0.25% DMT were without effect. Mice were not killed by oral doses of 3200 mg/kg, but were killed by the same doses administered intraperitoneally.[3] In animal experiments conducted by Kamal'dinova et al,[12] DMT was found to have a pronounced irritating effect on mucous membranes of the eye and the upper respiratory tract. In contrast to the American studies,[3,11] DMT was found in a USSR study[12] to irritate and penetrate the skin and to produce behavioral changes, hypertension, and anemia. The examinations of 150 workers involved in the synthesis of DMT disclosed moderate leukocytosis in several cases; however, this change might also have been caused by other airborne chemicals in the workplace. Krasavage et al[11] have shown that the inhalation of airborne particles of DMT at concentrations of 16.5 and 86.4 mg/m^3 caused no adverse toxicologic effects in rats exposed four hours per day for 58 days. In the latter study, the percentage of respirable particles ($\leqslant 5\ \mu m$) was 36%. Pups born to parents fed 0.5% and 1.0% DMT had significantly lower average body weights at weaning when compared to the controls, whereas other reproductive indices such as libido, pregnancy, gestation, litter size, and viability of the young were similar to that of the controls.[11]

TA and DMT can also present significant afety hazards: molten DMT will burn if nited and its vapor and dust as well as TA ust can form explosive mixtures with air.[2,3]

The extensive use of TA and DMT in industry and the lack of information on the ssue distribution, metabolism, and accumuation of these chemicals suggested the need or additional studies of these compounds sing radiolabeled material. The present udy was designed to obtain critical data on e absorption, distribution, and excretion of C-TA and ^{14}C-DMT following single and epeated oral, intratracheal, and dermal adinistration to rats and single ocular adinistration to rabbits.

Aterials and Methods

TA and DMT uniformly ring-labeled with arbon-14 were obtained from the Malnckrodt Chemical Works, St. Louis, Misouri.* Unlabeled TA and DMT were obined from Matheson Scientific Company, Cincinnati, Ohio. Adult male Charles River ats (200-225 g) were used in the oral, inratracheal, and dermal studies. Adult male ew Zealand albino rabbits (2-3 kg) were sed for the eye irritation study.

Labeled TA or DMT was prepared for ral administration by dissolving labeled "tracer only" group) or labeled and unbeled ("tracer and carrier" groups) TA or MT in peanut oil. The mixtures were then robe-sonicated for 5-10 minutes to obtain uniform distribution of labeled material. the oral study, groups of five rats each eceived a single oral dose by gastric intuation or on alternate days for 10 consecuve days (five doses). The levels of ^{14}C-TA mployed were tracer only, 40 mg and 80 g. ^{14}C-DMT was administered in tracer ly, 20 mg and 40 mg doses. Each dose ontained 4 μc tracer with or without added rrier compound.

For intratracheal, dermal, and ocular administration, labeled TA and DMT were prepared in 1% solutions of Triton-X-100 in distilled water. Injection solutions were probe-sonicated for 5-10 minutes immediately after preparation and before administration of each dose. The relative insolubility of DMT presented particular problems in the preparation and sampling of dosage mixtures. In the intratracheal study, groups of five rats each received either a single dose or multiple doses on alternate days for 10 consecutive days. The following levels of TA or DMT were used in this study: tracer only, 5 mg, and 10 mg (6 μc/dose). In the dermal study, doses of TA or DMT were applied in 0.2 ml of vehicle to the unabraded, depilated backs of rats, which were divided into two dosage groups. One group of rats received a single dose of 80 mg ^{14}C-TA or ^{14}C-DMT (4 μc); the remaining group received the same dose on alternate days for 10 consecutive days (five doses). After dosing, the treated area of the back was covered with a gauze patch, which was allowed to remain in place for the duration of the single dosage study and was removed only for dosing during the multiple dose study. In order to determine the total dose applied to the skin, the gauze patches were counted for residual radioactivity at the completion of the study. In the ocular instillation study, the proposed FDA Test for Eye Irritants[13] was followed. Eight albino rabbits were used for each test substance. A single 50 mg dose of ^{14}C-TA or ^{14}C-DMT (20 μc/dose) was instilled into the conjunctival sac of one eye of each rabbit. Five animals (Group I) from each group were exposed to the test substance for five minutes and then the eyes were washed copiously with distilled water and examined. Group II (three animals) received a 24-hour exposure to the test substance and the eyes were then washed and examined. All rabbits were sacrificed 10 days after dosing.

*Mention of commercial products or concerns does not nstitute endorsement by the U.S. Department of Health, ducation, and Welfare.

TABLE II
Cumulative Urinary and Fecal Excretion of ^{14}C-TA and ^{14}C-DMT Following Single Oral Administration to Rats[a]

Site	Time After Dosing (Hrs.)	Cumulative % Total Administered Dose[b] ^{14}C-TA			^{14}C-DMT		
		Tracer	40 mg	80 mg	Tracer	20 mg	40 mg
Urine	24	38.7	35.2	32.8	78.7	70.5	65.4
Urine	48	45.4	40.1	37.6	85.9	81.1	74.9
Feces	24	24.0	75.2	42.7	4.3	2.2	2.9
Feces	48	36.1	83.5	47.0	8.6	3.8	8.4
Total Excretion	24	62.7	110.4	75.5	83.0	72.7	68.3
(After Single Dose)	48	81.5	123.6	84.6	94.5	84.9	83.3

[a]Groups of five rats each received ^{14}C-TA or ^{14}C-DMT in peanut oil solutions by gastric intubation. Urine and feces collections were made at 24 and 48 hours after dosing.

[b]Values represent mean percentages of total administered dosage at 24 and 48 hours after single doses. Blood and other tissues were not counted in this study.

After dosing, animals were housed in metabolism cages for collection of urine and feces. All animals were allowed free access to food and water for the duration of the study. A fine mesh screen was used to separate urine and feces in each case. Feces were subsequently dried at low temperature (40°C) to a constant weight before oxidation and counting. In each study, one group of control animals receiving the injection vehicle only was maintained for the 10-day observation period.

All rats were sacrificed on the tenth day of each study by decapitation followed by exsanguination. Rabbits were sacrificed by intravenous administration of pentobarbital sodium. The following organs were removed and assayed at the conclusion of the oral, intratracheal and dermal studies: liver, lung, heart, kidney, spleen, adrenals, pancreas, testes, brain and femur. At the conclusion of the ocular instillation study, all of the above organs with the exception of the femur were studied. Soft tissues and urine were prepared for carbon-14 counting by dissolution with Soluene (Packard Instrument Company, Downers Grove, Illinois). Dried feces, bone, skin, and dermal patches were prepared for counting with the Beckman Biological Material Oxidizer, a total combustion furnace, which oxidizes carbonaceous materials to $^{14}CO_2$, which is subsequently collected for counting in a strong organic base.

Results

Oral Administration of ^{14}C-TA and ^{14}C-DMT

The results of the oral administration of ^{14}C-TA and ^{14}C-DMT in peanut oil to rats are summarized in Tables II and III. More than 80% of a single dose of ^{14}C-TA or ^{14}C-DMT was excreted in the urine and feces within 48 hours of administration (Table II). The excretion of ^{14}C-TA appears to be evenly distributed between urine and feces after a single dose. In contrast, ^{14}C-DMT is predominantly excreted in the urine of rats, and less than 10% of the administered dose appears in the feces. Repeated oral dosing with ^{14}C-TA or ^{14}C-DMT resulted in a similar pattern of excretion (Table III). After dosing on alternate days for 10 days (five doses), greater than 89% of the total administered dose of either compound was recovered in the urine and feces 24 hours after the last administration. The data indicate negligible tissue absorption or accumulation of the labeled material in all organs counted for radioactivity. A preliminary solvent extraction of urine and feces from ^{14}C-TA or ^{14}C-DMT-pretreated rats in 2:1 (v/v) chloroform-methanol revealed that the major portion of radioactivity was

TABLE III
Absorption, Distribution, and Excretion of ^{14}C-TA and ^{14}C-DMT in Rats Following Repeated Oral Administration on Alternate Days for 10 Days[a]

Site	% Total Administered Dose (5 Doses)[b] ^{14}C-TA			^{14}C-DMT		
	Tracer	40 mg	80 mg	Tracer	20 mg	40 mg
Urine	53.2	50.9	33.0	82.4	77.4	79.0
Feces	35.4	59.1	64.1	12.6	14.0	16.0
Blood	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
All Other Tissues[c]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total	88.6	110.0	97.1	95.0	91.4	95.0

[a]Groups of five rats each received ^{14}C-TA or ^{14}C-DMT in peanut oil solutions by gastric intubation on alternate days for 10 consecutive days (five doses).

[b]Values represent mean percentages of total administered dosage in dpm over the 10-day study period for groups of five rats each.

[c]The following tissues were counted: liver, lung, heart, kidney, spleen, adrenals, pancreas, testes, brain, and femur.

the water-soluble fraction. These data are onsistent with an extensive metabolism of ese compounds to water-soluble metabolites. Urinary and fecal excretion of ^{14}C-TA nd ^{14}C-DMT, following repeated oral administration, increased linearly with time nd dosage over the course of these experiments.

ntratracheal Administration of ^{14}C-TA and ^{14}C-DMT

The cumulative 24- and 48-hour urinary nd fecal excretion of ^{14}C-TA and ^{14}C-DMT following single intratracheal administration to rats is presented in Table IV. Approximately 49-73% of a single intratracheal dose of ^{14}C-TA is recovered principally in the urine (45.7-66.6%) with smaller quantities in the feces (3.4-6.4%) at 48 hours after dosing. Approximately 62% of a tracer dose of ^{14}C-DMT appears in the urine and feces with a similar pattern of distribution at 48 hours. Poor recoveries of the two higher doses of ^{14}C-DMT were obtained. These latter results may be attributed to inadequate sonication of the DMT emulsions prior to

TABLE IV
Cumulative Urinary and Fecal Excretion of ^{14}C-TA and ^{14}C-DMT Following Single Intratracheal Administration to Rats[a]

Site	Time After Dosing (Hrs.)	Cumulative % Total Administered Dose[b] ^{14}C-TA			^{14}C-DMT		
		Tracer	5 mg	10 mg	Tracer	5 mg	10 mg
Urine	24	57.0	39.5	47.0	51.6	16.2	13.3
Urine	48	66.6	45.7	53.2	57.5	19.1	15.2
Feces	24	5.5	2.7	3.4	1.8	1.0	0.6
Feces	48	6.4	3.4	4.3	3.2	1.0	1.0
Total Excretion	24	62.5	42.2	50.4	53.4	17.2	13.9
(After Single Dose)	48	73.0	49.1	57.5	61.7	20.1	16.2

[a]- ^{14}C-TA and ^{14}C-DMT were administered intratracheally in 1% aqueous Triton-X-100 solutions. Urine and feces collections were made at 24 and 48 hours after dosing.

[b]- Values represent cumulative mean percentages of total administered dose at 24 and 48 hours after dosing. Blood and other tissues were not counted in this study.

TABLE V
Adsorption, Distribution and Excretion of ^{14}C-TA and ^{14}C-DMT Following Repeated Intratracheal Administration to Rats (Alternate Days, 10 Days)[a]

	% Total Administered Dose (5 Doses)[b]					
	^{14}C-TA			^{14}C-DMT		
Site	Tracer	5 mg	10 mg	Tracer	5 mg	10 mg
Urine	82.6	38.8	52.4	53.8	16.7	13.0
Feces	9.1	1.9	4.4	2.3	0.8	1.1
Blood	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lung and Tracheal Lymph Nodes	0.3	0.1	0.1	0.2	<0.1	<0.1
All Other Tissues[c]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total	92.0	40.8	56.9	56.3	17.5	14.1

[a] ^{14}C-TA and ^{14}C-DMT were administered intratracheally in 1% aqueous Triton-X-100 solutions on alternate days for 10 consecutive days (five doses).

[b] Mean percentages of total administered dose in dpm over 10-day period for groups of five rats.

[c] Other tissues counted were: liver, brain, heart, spleen, testes, kidneys, femur, adrenals, and pancreas.

injection, poor sampling of the resulting heavy suspension, plugging of the injection needles during the course of administration, and/or expulsion of a portion of the dose by the animal shortly after administration. The results of the absorption, distribution, and excretion data for ^{14}C-TA and ^{14}C-DMT following repeated intratracheal administration to rats are shown in Table V. Less than 1% of the total administered dose of ^{14}C-TA or ^{14}C-DMT was found in the lungs and tracheal lymph nodes 24 hours after the last

TABLE VI
Absorption, Distribution and Excretion of ^{14}C-TA and ^{14}C-DMT Following Dermal Administration to Rats[a]

	% Total Administered Dose[b]			
	^{14}C-TA (80 mg)		^{14}C-DMT (80 mg)	
Site	1 Dose	5 Doses	1 Dose	5 Doses
Urine	1.6	4.3	9.3	10.0
Feces	0.6	2.2	1.5	2.4
Skin (1 In.^{2} Application Area)	1.9	2.1	5.5	3.3
Liver	0.7	0.6	0.8	0.2
All Other Organs[c]	0.3	0.2	1.2	0.1
Total	5.1	9.4	18.3	16.0

[a] ^{14}C-TA and ^{14}C-DMT were applied to the shaved backs of rats in 0.2 ml doses containing 80 mg of carrier and 4 μc tracer in 1% aqueous Triton-X-100 solution. In each study, five animals from each group received a single dose of ^{14}C-TA or ^{14}C-DMT; the remaining five animals from each group were dosed on alternate days for 10 days (five doses). All animals were sacrificed 24 hours after the last dose (day 10).

[b] Values for each site studied are expressed as mean percentages of the total administered dose in dpm over the 10-day study period for groups of five rats each.

[c] The following organs were also assayed: lung, heart, kidney, spleen, adrenals, pancreas, testes, brain, and femur.

injection. Negligible radioactivity (< 0.1%) was detected in all other organs assayed. The largest percentages of the total administered dose of each compound were recovered in the urine with smaller quantities in the feces after repeated dosing. This finding is in agreement with data obtained following a single intratracheal injection (Table IV). The poor total recoveries of the 5 and 10 mg doses of ^{14}C-TA and ^{14}C-DMT may be related to dosing errors as previously discussed and/or to reflex thoracic expulsion of portion of the administered dose.

Dermal Application of ^{14}C-TA and ^{14}C-DMT

The rate of absorption, distribution, and excretion of ^{14}C-TA and ^{14}C-DMT following single or repeated dermal application to the depilated backs of rats is presented in Table VI. No attempt was made to recover the total unabsorbed dose remaining on the skin application site which was washed free of residual material after sacrifice. In this study, negligible absorption and excretion of ^{14}C-TA occurred following single or repeated dermal dosing. In contrast, approximately 11% of the administered dose of ^{14}C-DMT was recovered in the urine and feces within 10 days following a single dermal application, and 13% of the total administered dose was excreted following repeated dermal administration on alternate days for 10 days. At the time of final patch removal, there was no evidence of skin irritation at the application site of animals treated with either compound.

Ocular Administration of ^{14}C-TA and ^{14}C-DMT

There was no significant absorption or excretion of ^{14}C-TA during the 11-day observation period following either the five-minute or 24-hour ocular exposure (Table VII). In contrast, approximately 29% of the administered dose of ^{14}C-DMT was recovered in the urine of rabbits receiving a five minute exposure, and approximately 37% of the administered dose was excreted by rabbits receiving a 24-hour exposure. Fecel excretion of ^{14}C-DMT was minimal ($\leq$ 2%) in this study and may be attributable to urine contamination. As expected, examination of the daily cumulative urinary and fecal excretion data over the 11-day observation period revealed that the absorption and excretion of these compounds is greater in animals receiving a 24-hour ocular exposure.

TABLE VII
Absorption, Distribution and Excretion of ^{14}C-TA and ^{14}C-DMT Following Ocular Administration to Rabbits[a]

	% Administered Dose[b]			
	^{14}C-TA (50 mg)		^{14}C-DMT (50 mg)	
Site	5-Minute Exposure	24-Hour Exposure	5-Minute Exposure	24-Hour Exposure
Urine	1.8	6.1	26.7	35.0
Feces	0.5	2.2	2.1	2.0
Eye	<0.1	<0.1	<0.1	<0.1
All Other Organs[c]	0.1	0.1	0.1	0.1
Total	2.4	8.4	28.9	37.1

[a]- ^{14}C-TA or ^{14}C-DMT was administered into the conjunctival sac of the left eyes of rabbits as a single 50 mg dose (20 μc) in 1% aqueous Triton-X-100 solution. See Materials and Methods for experimental protocol.

[b]- Values represent mean percentages of total administered dose for groups of three to five rabbits each.

[c]-Other organs examined were: liver, lung, brain, heart, testes, spleen, kidneys, adrenals, and pancreas.

Discussion

The results of these experiments demonstrate that TA and DMT are rapidly absorbed and excreted, and that no significant quantities of these compounds accumulate in the tissues following single or repeated oral, intratracheal, and dermal administration, or single ocular administration of low doses to laboratory animals. In a recent report by Schulz and Rubin[14] on the absorption, excretion, and metabolism of the related phthalate ester ^{14}C-di-2-ethylhexylphthalate (DEHP), essentially all of the administered dose of DEHP was excreted in the urine and feces within 24 hours following either oral of intravenous administration. In the latter study, evidence was also presented for the rapid hepatic uptake and conversion of DEHP to water-soluble metabolites one hour after dosing. It is possible that TA and DMT are also rapidly metabolized by the hepatic microsomal enzyme system to water-soluble metabolites. If such biotransformation pathways exist, a significant body burden of these compounds will probably not be achieved in the normal healthy individual. However, factors which reduce hepatic drug-metabolizing enzyme activity, e.g., exposure to hepatotoxic chemicals, altered nutrition, liver disease, etc., may alter the metabolism and excretion of these compounds and produce significant concentrations of these chemicals in critical body organs.[15]

Additional experiments on the pharmacokinetics of TA and DMT disappearance from the blood and distribution to the liver and other tissues at time intervals less than 24 hours after dosing are necessary. These studies would provide critical data on the time course of hepatic uptake and clearance and the appearance of possible water-soluble metabolites in the blood, urine, and feces. Such studies should also attempt to isolate and characterize the principal urinary and fecal metabolites of TA and DMT to determine the degree of hepatic biotransformation. In addition, the demonstration of kidney damage following prolonged feeding of 0.5% and 1.0% TA in the diet[10] warrants further study using routes of administration which better approximate worker exposure but at higher doses than those employed in the present study.

The dose-recovery problems encountered in the intratracheal phase of these experiments prevent a meaningful interpretation of these data. However, the lack of retention of DMT by pulmonary tissue in the present study is consistent with the low inhalation toxicity of DMT recently reported by Krasavage et al.[11] Further research efforts in this area are warranted to determine whether the low radioactivity in the lung and tracheobronchial lymph nodes in this study reflects rapid clearance or poor deposition of administered DMT.

In agreement with the studies of Kamaldinova et al,[12] single or repeated low doses of DMT were found to be absorbed and rapidly excreted by rats; however, no evidence of the skin irritation resulting from high dermal DMT doses in this Russian study was detected in the present experiments. In addition, data presented here indicate that DMT is also rapidly absorbed and excreted following a single instillation into the eyes of rabbits. The selective excretion of this material in the urine of rabbits suggests that a specific metabolic pathway for DMT may exist in this species. There is no evidence of significant absorption of TA following dermal or ocular administration.

The rapid absorption, excretion, and lack of tissue retention of TA and DMT revealed by these studies, combined with previous reports of the low acute and chronic toxicity of these compounds[1-3] indicate that TA and DMT may not present a significant industrial health problem to exposed workers involved in their manufacture or use, if care is taken to avoid excessive or prolonged contact.

Acknowledgment

The expert technical assistance of Mr. John Glass during all phases of this study

is gratefully acknowledged. The authors would also like to express their appreciation to Mr. Alvin Jose and Mr. William Ushry for their assistance in the sacrifice and autopsy of experimental animals.

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20 Hour Audiometric Training Workshop, September 25-27, 1975

Intensive two and a half day workshop is intended for safety directors, industrial nurses and others involved with the problems of noise pollution. Offered by Kutztown State College (midway between Allentown and Reading, PA). Fee is $125. Nearby accomodations are available. Contact Office of Continuing Education, Kutztown State College, Kutztown, PA 19530 (215) 683-3511, ext. 354.

International Symposium on Industrial Toxicology

Evaluation of the present staus of research in industrial toxicology, definition of future research, as well as a study of the relation of malnutrition, infection and climatic factors on various occupational diseases in developing countries will be on the agenda. Sessions will be held November 4-7, 1975 at the Toxicology Research Center, Lucknow, India. There is no fee. For information, address the Director, Industrial Toxicology Research Center, Mahatma Gandhi Marg, Post Box No. 80, Lucknow 226001 India.

New Hanover SWR

RECEIVED
MAY 24 1976
SOLID WASTE-VECTOR CONTROL

Project UP

P. O. Box 330
514 Market Street
Wilmington, N. C. 28401
Telephone 762-9565

May 21, 1976

Mr. Odell W. Strickland
Division of Health Services
Solid Waste and Vector Control Branch
Box 2091
Raleigh, North Carolina

Dear Mr. Strickland,

Mr. William Reilly, Cape Fear Council of Governments, suggested that I contact you for some specific information.

We are involved in a county-wide clean-up program (see enclosed Fact Sheet) and have determined that much illegal dumping would be eliminated if there was a county-wide mandatory, enforceable garbage collection. Green boxes would not take care of discarded sofas, appliances etc., but a franchise could collect such items on a specific week day as is done in Wilmington for those who subscribe to collection.

Our adjoining counties have no such system, but Mr. Reilly felt that you would have the information on counties that have instigated this program. How was it done; what cost was involved; how effective has it been; what problems and solutions were incurred.

I realize that this is a large request, but I feel that littering and dumping will be reduced substantially by this method, and that there is little hope of curtailing the accumulation of trash until our county adopts an enforceable ordinance or law.

I would appreciate any information that would be helpful.

Sincerely,

Jean Van Moss

Jean Van Moss
Co-ordinator

jvm/lsp

Copy New Hanover Co. Solid Waste Plan of April 1975 mailed 6-7-76
B. McLamb

New Hanover
Ark

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

325 NORTH SALISBURY STREET

RALEIGH 27611

JAMES E. HOLSHOUSER, JR.
GOVERNOR

DAVID T. FLAHERTY
SECRETARY

TELEPHONE
919/829-4534

April 15, 1975

Asa B. Foster, Jr., P.E.
Director
Hazardous Materials Control Division
U.S. Environmental Protection Agency
Region IV
1421 Peachtree Street, N.E.
Atlanta, Georgia 30309

Dear Mr. Foster:

Attached is a report that was prepared by the Solid Waste and Vector Control Branch following their investigation of the complaint of Mrs. Augusta Cooper to the Environmental Protection Agency concerning operations at the Wilmington Scrap Iron and Metal Company, Wilmington, North Carolina. As the report shows, there is no evidence of a health hazard due to the recycling operation in the area.

If this office can provide you additional information or assistance in this matter, I shall appreciate hearing from you.

Sincerely,

Dave

David T. Flaherty
Secretary

bm
Attachment
cc: Mrs. Augusta Cooper
Mr. O. W. Strickland
New Hanover County Health Department
Dr. Jacob Koomen
Mr. Marshall Staton

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

POSTED APR 16 1975 DEPT. OF HUMAN RES. SECRETARY'S OFFICE (CS)

REPORT OF INVESTIGATION OR INSPECTION OF Recycling Facilities

Place visited Wilmington Scrap Iron & Metal Co. Date April 9, 19 75

Address 6th & Brunswick Sts., Wilmington, N. C. Time spent 2 hours

By whom O. W. Strickland, Division of Health Services
Mr. W. H. Cranford, Director of Sanitation Activities, New Hanover Co. Health Dept.

Persons contacted Plant Manager
(Owner, agent, tenant, manager, other)

Reason for visit Letter to U.S. Environmental Protection Agency

Copies to:
Mr. Asa B. Foster, U. S. Environmental Protection Agency
New Hanover County Health Department, 2029 South 17th Street, P. O. Box 3763, Azalea Station, Wilmington, N. C. 28401
Mrs. Augusta Cooper, Chairman, Executive Board, The Homeowners Improvement Association, 815 N. Sixth Street, Wilmington, N. C. 28401
(2) Mr. David T. Flaherty, Secretary, N. C. Dept. of Human Resources
Dr. Jacob Koomen, Director, Division of Health Services
Mr. Marshall Staton, Chief, Sanitary Engineering Section, DHS

REPORT:

The Wilmington Scrap Iron & Metal Company has been located at the same address in Wilmington for many years.

In recent years the Company has added a paper shredder and bailer to their operation. The shredder has been enclosed and insulated to cut down on noise.

The premises were inspected and no evidence of rats or other vectors could be found.

CONCLUSION:

While it is not desirable to have mixed land use, there is no evidence of a health hazard due to the recycling operation in the area.

OWS:ct

Form 434
SBH Form 1489
Sanitary Engineering

Final

DRAFT
April 11, 1975

Asa B. Foster, Jr., P.E.
Director
Hazardous Materials Control Division
U.S. Environmental Protection Agency
Region IV
1421 Peachtree Street, N.E.
Atlanta, Georgia 30309

Re: Control No. 51177

Dear Mr. Foster:

Attached is a report that was prepared by the Solid Waste and Vector Control Branch following their investigation of the complaint of Mrs. Augusta Cooper to the Environmental Protection Agency concerning operations at the Wilmington Scrap Iron and Metal Company, Wilmington, North Carolina. As the report shows, there is no evidence of a health hazard due to the recycling operation in the area.

If this office can provide you additional information or assistance in this matter, I shall appreciate hearing from you.

Sincerely,

David T. Flaherty
Secretary

bm
Attachment
cc: Mrs. Augusta Cooper
Mr. O. W. Strickland
New Hanover County Health Department
Dr. Jacob Koomen
Mr. Marshall Staton

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF Recycling Facilities

Place visited Wilmington Scrap Iron & Metal Co. Date April 9, 19 75

Address 6th & Brunswick Sts., Wilmington, N. C. Time spent 2 hours

By whom O. W. Strickland, Division of Health Services
Mr. W. H. Cranford, Director of Sanitation Activities, New Hanover Co. Health Dept.

Persons contacted Plant Manager
(Owner, agent, tenant, manager, other)

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(2) Mr. David T. Flaherty, Secretary, N. C. Dept. of Human Resources
Dr. Jacob Koomen, Director, Division of Health Services
Mr. Marshall Staton, Chief, Sanitary Engineering Section, DHS

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The premises were inspected and no evidence of rats or other vectors could be found.

CONCLUSION:

While it is not desirable to have mixed land use, there is no evidence of a health hazard due to the recycling operation in the area.

OWS:ct

Form 434
SBH Form 1489
Sanitary Engineering

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

325 NORTH SALISBURY STREET

RALEIGH 27611

JAMES E. HOLSHOUSER, JR.
GOVERNOR

DAVID T. FLAHERTY
SECRETARY

TELEPHONE
919/829-4534

April 2, 1975

Asa B. Foster, Jr., P. E.
Director
Hazardous Materials Control Division
U. S. Environmental Protection Division
Region IV
1421 Peachtree Street, N. E.
Atlanta, Georgia 30309

Dear Mr. Foster:

I have been informed by the personnel of the Solid Waste and Vector Control Branch that they plan to investigate the complaint of Mrs. Augusta Cooper that was sent to the Environmental Protection Agency concerning operations at the Wilmington Scrap Iron and Metal Company in Wilmington, North Carolina.

I am not sure that this agency will be able to provide assistance in the alleviation of this problem but the investigation will be made specifically to determine if there are problems of public health significance created as a result of this operation. I shall be glad to provide you with a copy of the report that is prepared following this investigation.

If I may be of further assistance to you, please do not hesitate to contact my office.

Sincerely,

Dave

David T. Flaherty
Secretary

DTF:cw

cc: Mrs. Augusta Cooper
✓Mr. O. W. Strickland
Mr. Marshall Staton

DRAFT
March 19, 1975

Asa B. Foster, Jr., P.E.
Director
Hazardous Materials Control Division
U. S. Environmental Protection Agency
Region IV
1421 Peachtree Street, N. E.
Atlanta, Georgia 30309

Re: Control No. 51177

Dear Mr. Foster:

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I am not sure that this agency will be able to provide assistance in the alleviation of this problem but the investigation will be made specifically to determine if there are problems of public health significance created as a result of this operation. I shall be glad to provide you with a copy of the report that is prepared following this investigation.

Sincerely,

David T. Flaherty
Secretary

SHU:bm
cc: Mrs. Augusta Cooper
✓Mr. O. W. Strickland
Mr. Marshall Staton

SECRETARY OF HUMAN RESOURCES

REQUEST FOR ACTION

Name Ms. Augusta Lopez No. 51177 Control

Date Received 3/18/75 Referred To Lopez

Date of Interim Reply 3-19-75 Date of final Reply

Received by

Comments:

Name Asa B. Foster, Jr. P.E.

Address Director - Hazardous Materials Control Division

City U.S. Environmental Protection Agency, Atlanta, Ga.

Telephone — Business _____ Home _____

CONTROL NUMBER	DATE	COUNTY	REFERRED TO	REPLY ON OR BEFORE	TAKEN BY
51177	3/11		Health	3/21	CW

Origin

HOTLINE	GOV. OFF.	GOV. OMB.	SEC. OFF.	PEOPLES DAY	OTHER
			X		
WRITTEN	VISIT	PHONE	OTHER		
X					

☐ Reply noting referral from ☐ Secretary ☐ Governor ☐ Secretary & Governor ☐ Other _____

☐ Investigate & furnish this office with necessary information to respond.

☑ Draft reply for ☑ Secretary's signature ☐ Governor's signature ☐ Other _____

☐ Immediate telephone response requested.

☐ For your information — no response required.

Synopsis of request

Needs assistance!

RECEIVED
MAR 18 1975
SANITARY ENGINEERING SECTION

Action taken & date

See Attached Letter

Return all original information with the white copy
Retain the yellow copy with your files

Hewitt

Draft reply for Flaherty's signature if we can't help please forward to appropriate source

JCS

3/14

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

March 10, 1975

MAR 13 1975

Mr. David Flaherty, Secretary
Department of Human Resources
P. O. Box 2091
Raleigh, North Carolina 27602

Dear Mr. Flaherty:

We are sending you a copy of the attached letter for your information and use. Since the letter mentions health hazards we felt you would be interested.

As you know, we receive numerous complaints about any and everything. In the interest of economy and since it may well be that the Environmental Protection Agency does not have any jurisdiction in this instance I would very much appreciate your staff looking into this situation and relating the pertinent facts to us.

If we can be of assistance to you please let us know.

Sincerely yours,

Asa B. Foster, Jr., P.E.
Director
Hazardous Materials Control Division

1 Attachment

cc: Marshall Staton

615 North Sixth Street
Wilmington, North Carolina 28401
January 31, 1975

The U. S. Environmental Protection Agency
Washington, D. C. 20036

Dear Sir:

The members of the Homeowners Improvement Association and area residents are seeking removal of a Re-cycling Plant, located in a closely populated residential area and proves itself a nuisance factor involved as a result of the noise, health hazards, and the use of the mechanical device known as the recycling operation.

We are contacting all agencies involved in Environmental Protection. If you can assist us, or direct us to helpful contacts to aid in the removal of said plant, The Wilmington Scrap Iron and Metal Company, located at Sixth and Brunswick Streets, Wilmington, North Carolina, we will be most appreciative and you will have done us a community service.

The Homeowners Improvement Association

Augusta Cooper

(Mrs.) Augusta Cooper,
Chairman Executive Board

Dorothy B. Johnson

(Mrs.) Dorothy B. Johnson,
Assistant Secretary

Serial No. 3023
Date January 28, 1975

PROJECT AUTHORIZATION

Project: Resource Recovery from Municipal Solid Waste, Research and Development

Collaborating Agencies: ~~Department of the Interior~~ Federal Energy Administration and the Environmental Protection Agency. The Institute for Energy Analysis will perform certain parts of the research and development work.

Duration: Completion of Phase I--approximately September 1975

Cost: $400,000 (Includes $80,000 from the ~~Department of the Interior~~ Federal Energy Administration and $100,000 from the Environmental Protection Agency)

Budget Category: Power Operations (Other Production Expenses)
Reimbursable Services

Purpose and Character: It is proposed to study the potential of a resource recovery and recycling system in the Tennessee Valley based on processing urban waste for the recovery of a fuel fraction for use in steam-electric boilers or in gas turbines and the recovery of noncombustible materials for recycling including metals and glass. Studies of this type are needed to determine the practicality of using steam-electric boilers or gas turbines to dispose of the combustible fraction of municipal refuse and the commercial practicality of the overall scheme. The work authorized herein is for the purpose of developing adequate data to permit a logical decision as to whether or not to proceed with the actual design and construction of one or more waste processing plants and related facilities.

Administrative Approvals:

[illegible] Chief, Budget Staff

[illegible] Comptroller

Robert H. Morris General Counsel

Lynn Seeber General Manager

Authorized, Subject to Availability of Funds:

THE GENERAL MANAGER

General Manager

Date

THE BOARD OF DIRECTORS

Madge Evans Assistant Secretary

February 6, 1975 Date

2-11-75 PW

RESOURCE RECOVERY FROM MUNICIPAL SOLID WASTE

PROJECT WORKPLAN
(Phase I)

INTRODUCTION

Following substantial preliminary investigations, it has become apparent that there is a substantial need for a design and economic research program on the establishment of a system for energy and resource recovery from municipal solid waste in the Tennessee Valley. A resource recovery system would incorporate the salvage of the reusable fractions of municipal solid waste for resale and provide for burning the combustible fraction in steam-electric boilers or processing it further for use in gas turbines. The need for this program is based on the face that traditional energy resources are in scarce or limited supply and increasing in cost not only in the Tennessee Valley but throughout the world. This project if undertaken could (a) result in the development of a significant new energy resource, (b) save for TVA the energy equivalent one million tons or more of coal per year through substitution of solid waste derived fuel, and (c) because recycling of aluminum, steel, glass, etc., is less energy-consumptive than the production of the same materials from virgin sources, energy will be saved in the industrial sector. In addition this research will provide many of the answers needed by the American electric utility industry so that solid waste derived fuel might be more rapidly accepted by the industry.

To date several important technical and economic questions have not been resolved, particularly in the reference to a system serving a large geographic area: economics of locating, constructing, and operating resource recovery plants and related system elements; long-range costs of operating coal-fired plants of retirement age in order to fulfill municipal solid waste disposal contracts; feasibility of liquifying or gasifying the solid fuel;

effects on operating characteristics of power plants caused by modifications to burn solid waste, etc. These factors must be thoroughly investigated before a resource recovery system is developed to assure that the addition of such a system to the TVA power system will not cause an upward impact on power system expenses.

It is recognized by TVA that the economic and environmental impacts of source reduction and source separation are topics requiring further investigation and ones which will be investigated during the course of this study. Until the study has been completed, and all participants have had an opportunity to assess the effects which source reduction and source separation policies would have on the economic feasibility of the type of recovery system under study, it would be premature for TVA to draw conclusions concerning the merits of any particular policy relating to source reduction and source separation or to advocate the adoption thereof.

The development of a resource recovery system would be accomplished in two phases. Phase I would consist of technical studies and testing to investigate problems associated with burning solid waste in power boilers, conceptual and preliminary designs of processing plants, cost estimates for the processing plants, conceptual and preliminary designs of power plant modifications, cost estimates for the power plant modifications, studies to define suppliers of solid waste and potential market for products from processing plants, and system economic studies to show whether burning of solid waste will impact electric power rates of the Tennessee Valley Authority.

Phase II would consist of constructing processing plants, modifying power plants to burn processed solid waste, constructing handling facilities at power plants, contracting for supply of municipal solid waste to processing plants, contracting for transportation of processed solid waste from processing plants to power plants, and contracting for sale or disposal of byproducts from the processing plants.

The estimated cost of Phase I of this proposed project is $310,000 for F.Y. 1975 and $90,000 for F.Y. 1976. The total cost of a resource recovery project could be $8 million to $80 million for F.Y. 1975 through F.Y. 1978, depending on decisions made by using Phase I investigations. If a determination is made on the basis of Phase I conclusions and recommendations to construct and operate a resource recovery system, then an amendment to the project authorization would be requested by a TVA organization to provide for those activities.

The initiation of Phase I does not represent a commitment to undertake all or part of Phase II. Recommendations relating to Phase II will be developed following the Phase I work.

TASK SUMMARY

Task Number	Title	Cost
1	Project Management	25,000
2	Preparation of Preliminary Reports	10,000
3	Conceptual Design and Cost Estimate - 1,000 ton/day Processing Plant	100,000
4	Conceptual Design and Cost Estimate Power Plant Modification	25,000
5	Economic Analyses	60,000
6	Studies on Technical Problems - Results of Union Electric Studies	35,000
7	Studies on Supply of Solid Waste and Sale of Reclaimed Products	35,000
8	Waste Sampling Study	20,000
9	Gasification or liquefaction as an Alternative to Solid Fuel Concept	40,000
10	Final Report (Internal)	20,000
11	Publication of Final Report (External) and Holding of Seminars for Utility Industry	10,000
	Contingencies	20,000
		400,000

BUDGET

Resource Recovery from Municipal Solid Waste

Task Number	FY 1975	FY 1976	Total	Dates Start	Dates End
1	15,000	10,000	25,000	2/75*	10/75
2	10,000		10,000	2/75*	7/75
3	80,000	20,000	100,000	2/75*	7/75
4	25,000		25,000	2/75	7/75
5	60,000		60,000	2/75*	6/75
6	20,000	15,000	35,000	2/75*	9/75
7	30,000	5,000	35,000	2/75*	6/75
8	20,000		20,000	2/75	6/75
9	30,000	10,000	40,000	2/75	6/75
10	10,000	10,000	20,000	2/75	6/75
11		10,000	10,000	11/75	1/76
Contingencies	10,000	10,000	20,000		
	310,000	90,000	400,000		

*Some work on these tasks has been done during the preliminary investigations.

TASK DEFINITION

Task Number: 1

Title: Project Management

Responsible Organization: Office of Power

Task Leaders:

Objective: The goal of this task is to assure that the project objectives are accomplished on schedule, within budget, and to the satisfaction of TVA, FEA, and EPA.

Description of Work: Provide overall administration. Establish and/or review plans, coordinate all correspondence, and edit and issue reports.

Cost Estimate: $25,000

OBJECTIVE AND SCOPE

The objective of this project is to evaluate the feasibility of constructing and operating a resource recovery system to process municipal solid waste, reclaim the recyclable fraction, and burn the combustible fraction in steam-electric boilers or convert it to liquid or gaseous fuels for burning in gas turbines. The scope of this project covers conceptual and preliminary designs for processing plants, cost estimates for the processing plants, conceptual and preliminary designs of modifications to power plants so that they can burn processed solid waste, cost estimates of the power plant modifications, technical studies to determine the feasibility of gasification or liquefaction as an alternative to solid fuel, technical studies to investigate problems associated with burning solid waste in power plant boilers, studies on the supply of solid waste and potential markets for reclaimed materials, and system economic studies to determine whether operation of a resource recovery system will impact power rates of the Tennessee Valley Authority.

TASK DEFINITION

Task Number: 3

Title: Conceptual Design and Cost Estimate - 1,000 ton/day Processing Plant.

Responsible Organization: Office of Engineering Design and Construction

Task Leaders:

Subtasks:

3.1 Use of Consultant to Conceptually Design Plant

3.1.1 Negotiations with Consultant

3.1.2 Conceptual Design by Consultant

3.1.3 Preparation of Report by Consultant

3.2 Preliminary Design by OEDC

3.3 Cost Estimate by OEDC

3.4 Preparation of Report by OEDC on Design and Cost

Objective: To obtain from a consultant a written agreement defining the areas to be studied and the responsibilities under which the program will be conducted. To obtain from a consultant a conceptual design for a 1,000 ton/day plant for processing municipal solid waste. To obtain from the consultant a satisfactory report on the conceptual design. To prepare a preliminary design within TVA for the processing plant, using the consultants' conceptual design as a basis. To prepare a cost estimate for the processing plant, as designed. To prepare a report defining the preliminary design and the basis for the cost estimates.

TASK DEFINITION

Task Number: 2

Title: Definition of Scope Preparation of Preliminary Reports

Responsible Organization: Office of Power

Task Leaders: Elmo Emily (2.1)

Bill McKinney (2.2)

Philip Hyatt (2.3)

Subtasks:

2.1 Preparation of Environmental Evaluation Record (Phase II)

2.2 Preparation of Final Project Plan (Phase I)

2.3 Studies on Methods to Finance the Project (Phase II)

Objective: To define the impact this project (Phase II) will have on the environment. To modify the project work plan as required. To explore and define methods of financing all elements of Phase II of the project.

Description of Work: Prepare a final project plan defining the objective and scope of this project and outlining the schedule, organization, and cost for the overall study. Evaluate environmental effects and prepare an environmental evaluation record defining the environmental impacts of Phase II on this project. Make economic evaluations on methods to provide financing for the project, Phase II.

Cost Estimate: $10,000

TASK DEFINITION

Task Number: 4

Title: Conceptual Design and Cost Estimate - Power Plant Modification

Responsible Organization: Office of Engineering Design and Construction

Task Leaders:

Subtasks:

4.1 Conceptual Design by OEDC

4.2 Preliminary Design by OEDC

4.3 Cost Estimate by OEDC

4.4 Preparation of Report by OEDC on Modification Design and Cost

Objective: To obtain from OEDC a conceptual design and cost estimate for modifying power plants to burn processed solid waste and constructing handling facilities at power plants.

To obtain a preliminary design from OEDC for the power plant modification.

To obtain from OEDC a report defining the cost and design necessary to make modifications and construct handling facilities at power plants.

Description of Work: Provide the necessary time and manpower required to obtain data and information pertinent to making these studies and for the actual work involved in developing the conceptual design, preliminary design, and cost estimate.

Cost Estimate: $25,000

Description of Work: Negotiate with a consultant so that a conceptual design of a 1,000 ton/day processing plant can be obtained. Prepare letters and attend meetings to discuss the participation of the consultant in the program. Coordinate the consultant's efforts with OEDC so that preliminary design and cost estimates can be made by OEDC. Prepare and distribute reports made by the consultant and OEDC, as required.

Cost Estimate: $100,000

TASK DEFINITION

Task Number: 5

Title: Economic Analyses

Responsible Organizations: Office of Power (5.2 - 5.7), Office of Tributary Area Development (5.1)

Task Leaders:

Subtasks:

5.1 Economic Analysis of Site Location

5.1.1 Economic Analysis of Transporting Municipal Solie Waste to Processing Plants

5.1.2 Economic Analysis of Transporting Processed Solid Waste to each Power Plant

5.1.3 Economic Analysis of Transporting Reclaimed Products to Markets

5.2 Systems Analysis of Capital and Operating Economics of Each Processing Plant

5.3 Studies of Impact on Individual Power Plant Costs (Ash Disposal, Etc.)

5.4 Studies of Impact on Economic Dispatch for Each Power Plant

5.5 Overall Economic Assessment of Resource Recovery System

5.6 Preparation of Preliminary Report on Economic Analyses

5.7 Preparation of Final Report on Economic Analyses

Objective: To provide an economic analysis of the optimum site locations for the processing plants. This analysis will include cost analyses for transporting municipal solid waste to the processing plants, for transporting processed solid waste to each power plant, and for transporting reclaimed products to markets. To obtain for each processing plant a systems analysis of the capital and operating costs and income from sales and/or dumping fees.

To determine the impact on each power plant's costs of burning the combustible

fraction of municipal solid waste. These costs would include modifications to or increased costs for ash disposal ponds, costs for operating a coal-fired power plant of retirement age over obtaining the same quantity of power from a nuclear plant when this is necessary to fulfill municipal solid waste disposal contracts, etc.

To obtain an overall economic assessment of the resource recovery system.

To obtain preliminary and final reports defining the results of these economic analyses.

Description of Work: Provide the time and manpower necessary to make these economic studies. Prepare and distribute the report to the appropriate organization.

Cost Estimate: $60,000

TASK DEFINITION

Task Number: 6

Title: Studies on Technical Problems

Responsible Organization: Office of Power

Task Leaders:

Subtasks:

6.1 Study on Boiler Corrosion

6.2 Study on Fallout of Organics

6.3 Study on Effects of ESP Operation and Collection Efficiency

6.4 Study on Problems in Meeting Pollutant Regulations

6.5 Preparation of Report on Studies of Corrosion, Fallout, ESP effects, Pollutants

6.6 Investigation of Burners for Burning Municipal Solid Waste

6.7 Preparation of Report on Burner Investigation

6.8 Determination of Ash Resistivity in Burning Solid Waste Mixture

6.9 Preparation of Report on Ash Resistivity

Objective: To determine the effects which burning municipal solid waste in power plant boilers will have on power plant equipment and operation, including such factors as boiler corrosion, fallout of organics, and effects on electrostatic precipitator operation and collection efficiency.

To determine pollution problems which may be associated with burning municipal waste in power plants and to determine how pollutant regulations may be met.

To obtain a report defining the results of the studies on boiler corrosion, fallout of organics, effects on electrostatic precipitator operation and efficiency, and pollutant problems.

To determine the applicability of burners for burning municipal solid waste.

To obtain a report exploring the applicability of burners for burning municipal solid waste.

To determine the resistivity of ash produced by burning the proposed coal-solid waste mixture in power plants.

To obtain a report defining the characteristics of the ash which results from burning the coal-solid waste mixture.

Description of Work: Contact Union Electric for information on and results of their studies concerning boiler corrosion, burner design, and possible pollution effects such as organic fallout and effects on electrostatic precipitator performance caused by burning municipal solid waste. Review possible problems in meeting pollutant regulations. Investigate burners for burning municipal solid waste. Cooperate in the determination of resistivity in burning solid waste mixture.

Aid in the preparation of the report and prepare reports on the information and conclusions derived from the other studies. Distribute these reports to the appropriate organizations.

Cost Estimate: $35,000

TASK DEFINITION

Task Number: 7

Title: Studies on Supply of Solid Waste and Sale of Reclaimed Products

Responsible Organization: Office of Tributary Area Development

Task Leader: Ed Bales

Subtasks:

7.1 Study on Supply of Municipal Solid Waste to Each Processing Plant

7.2 Study on Supply of Processed Solid Waste to Each Power Plant

7.3 Study of Feasibility of Front-end Paper Recovery

7.4 Study on Sale of Reclaimed Products from Processing Plants

7.5 Study on Effect of Varying Levels of Recovered Materials on Project Economics

7.6 Preparation of Report on Supply of Solid Waste and Sale or Products

Objective: To obtain information concerning the availability of municipal solid waste and how it is to be supplied to each processing plant and power plant. To obtain information on the market for and the ability to sell reclaimed products from processing plants.

Description of Work: Provide the necessary personnel to investigate the availability and methods of supplying solid waste and study the market value of reclaimed products. Prepare and distribute the report to the appropriate organization.

Cost Estimate: $35,000

TASK DEFINITION

Task Number: 8

Title: Waste Sampling Study

Responsible Organization: Office of Tributary Area Development

Task Leader: Ed Bales

Objective: During the summer of 1974, TVA conducted a sampling program in the TVA region. This study found metal and glass components in the TVA region to be almost twice as high as the national average. The objective of this task is to complete another waste sampling study to establish some degree of confidence in the findings of the first study. Several different sampling techniques will be reviewed before selecting a procedure to follow in this task. Care will be taken in any procedure adopted to provide analytical data for determining what impact source reduction might have on the waste composition.

Description of Work: This task will be performed in the next few months to take advantage of the seasonal variations in disposal habits. This task will most likely be contracted to an outside firm whose work will be closely supervised by TVA. Assuming some free labor could be contributed by local governments as was done in the first sampling study, the cost of this task is estimated to be approximately $20,000.

Estimated Cost: $20,000

TASK DEFINITION

Task Number: 9

Title: Gasification as an Alternative to Solid Fuel Concept

Responsible Organization: Office of Power

Task Leader: Carl O. Thomas, Institute of Energy Analysis

Bill McKinney, Office of Power

Subtasks:

9.1 Analysis of supplemental process to prepare gaseous or liquid fuels (e.g. methanol) or chemical products from solid waste, combustible fraction, and sewage sludge

9.1.1 Evaluation of existing waste gasification systems and with or without methanation

9.1.2 Evaluation of methanol, ammonia, and other product syntheses processes which may use gasifier outputs

9.1.3 Evaluation of economies of scale and their impact on collection, transportation, processing, and storage strategies

9.1.4 Economy analysis relative to the various end product cost on both energy and mass basis

9.1.5 Analysis of environmental issues associated with the various processes; e.g., water demand, waste heat, emissions, and fuel burning characteristics

9.1.7 Comparison with the relative merits of fuel saving in coal versus fuel saving in oil and natural gas

9.2 Supply/demand projections in the various product categories

9.3 Preparation of final report and recommendations jointly with TVA

9.4 Participation in public information seminar jointly with TVA

Objectives: To provide a comparative economic and engineering analysis of the base case and various fuel or chemical product option involving gasification and other processing steps which would utilize segregated combustibles from the base case. This task, to be conducted in close coordination with TVA's base case study, is intended to give adequate consideration to all realistic processing and product strategies prior to entering the next pilot or demonstration plant stages.

Description of Work: Institute of Energy Analysis will provide senior professional staff to collect, analyze, and evaluate the information necessary to accomplish the stated task and subtasks. All work will be carried out in close and continued coordination with TVA and other participating groups.

Cost Estimate: $40,000

TASK DEFINITION

Task Number: 10

Title: Preparation of Final Report (Internal)

Responsible Organization: Office of Power

Task Leader: Bill McKinney

Objective: To document the data and conclusions derived from this study.

Description of Work: Write and correlate the information and findings of this study. Distribute the final report to the appropriate organizations.

Cost Estimate: $20,000

TASK DEFINITION

Task number: 11

Title: Publication of Final Report (External) and Holding of Seminar for Utility Industry

Responsible Organization: Office of Power

Task Leader: Bill McKinney

11.1 Preparation of Final Report (External)

11.2 Dissemination of Information on Report and Advertising of Seminars

11.3 Holding of Seminar for Electric Utility Industry

Objective: To prepare a report on the project suitable for use by other public- and investor-owned utilities interested in establishing resource recovery facilities within their market areas. To hold seminars on resource recovery to be attended by representatives of electric utilities across the nation. To encourage better understanding and more rapid acceptance of resource recovery technology by the electric utility industry.

Description of Work: The internal report prepared for TVA use under Task Number 10 will be revised and condensed into a public report suitable for use by any electric utility company desiring to explore the possibilities of using solid waste derived fuel. One seminar would be held in early 1976. The seminar would be aimed at answering the technical and economic questions regarding the utilization of solid, liquid and gaseous fuels produced from solid waste.

Cost Estimate: $10,000

KENTUCKY
VA
Paducah
Tri-Cities
Nashville
Knoxville
Jackson
TENNESSEE
N. CAR
Asheville
Memphis
Chattanooga
Huntsville
MISS
ALABAMA
GEORGIA
Columbus
★ Proposed Waste Processing Centers

February 22, 1974

Mr. W. H. Cranford, R. S.
Director, Sanitation Activities
New Hanover County Health Department
21 N. Fourth Street
Wilmington, N. C. 28401

Dear Mr. Cranford:

From all the reports that I have been receiving, especially from Mr. Terry Dover, the landfill operation in New Hanover County is going very well.

Mrs. Sharpe of the League of Women Voters was high in her praise of the operation.

Now that you have a good landfill operation, I feel that the County of New Hanover would want to take another look at the collection program.

Based on observation of our staff there seems to continue to be a great deal of roadside dumping.

If this office can be of assistance in evaluating the over-all solid waste management program and needs in New Hanover County, please let us know.

Sincerely,

O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section

OWS/ct
cc: Mr. Terry Dover
Mr. Lonnie Poole
Dr. Joseph C. Knox

- New Hanover

J + A

out

October 16, 1973

Mr. Clayton McDonald
Route 2, Box 2425
Wilmington, North Carolina 28401

Re: Pollution Help Line Report 1433

Dear Mr. McDonald:

The attached report has been prepared by Mr. Terry F. Dover, District Sanitarian, following his recent investigation of your complaint concerning the waste material being used as a base for the construction of a road across the end of the pond on your property.

If this office can be of further assistance, please let us know.

Very truly yours,

Sidney H. Usry, Head
Solid Waste & Vector Control Branch
Sanitary Engineering Section

bm
Attachment
cc: Mr. Walter Burnette
Mr. Henry Cranford
Mr. Terry F. Dover
Mrs. Jackie Wall

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF A solid waste complaint

Place visited New Hanover County **Date** October 11, **19** 73

Address Route 2, Box 245, Wilmington, NC **Time spent** 2 hours

By whom Terry F. Dover, District Sanitarian, Solid Waste and Vector Control Branch, Division of Health Services

Persons contacted Mr. Clayton McDonald and Mr. Walter Burnette
(Owner, agent, tenant, manager, other)

Reason for visit Pollution Help Line Report #1433

Copies to:
Mr Clayton McDonald, Route 2, Box 245, Wilmington
Mr. Walter Burnette, Carolina Beach Road, Wilmington
Miss Jackie Wall, Pollution Help Line
Mr. Henry Cranford, New Hanover County Health Department

REPORT:

Mr. Henry Cranford of the New Hanover County Health Department and I visited the above address and contacted both Mr. Clayton McDonald and Mr. Walter Burnette.

Mr. Brunette is filling one end of a small pond with demolition and wood waste for the purpose of using the material as a base for the construction of a road across the end of the pond. Mr. Burnette at one time owned all property around the pond but now Mr. McDonald has purchased a lot and house adjoining the pond with the lot line running across one corner of the pond.

The filling operation is within 250 feet of Mr. McDonald's home. Mr. McDonald feels that not only is the filling unsitely causing certain debris to float in the pond but also he is afraid the filling will harm the water and fish in the pond.

It was observed that the fill material included wood waste, paper products, bricks and cement blocks, shingles and an old couch was also seen. No evidence indicated the presence of household garbage.

Recommendations:

1. Mr. Burnette should limit the types of material being used for fill to clean wood waste, cement blocks, bricks and earth. All paper products shall be excluded.

2. The filling operation should be completed as soon as possible and all deposited material shall be covered with at least two feet of clean earth.

Next

June 27, 1973

Mr. Jim Colley
4607 Carolina Beach Road
Wilmington, North Carolina

Re: Pollution Help Line Report No. 1271

Dear Mr. Colley:

I am sending a copy of the above report to Mr. Terry F. Dover, District Sanitarian, requesting that on his next visit to the area that he investigate the conditions described and make recommendations to alleviate the problem.

If I can provide you with additional assistance, I shall appreciate hearing from you.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm
cc: Mr. Terry F. Dover
Mrs. Jackie Wall

IN REPLYING REFER TO: NO. 1271

POLLUTION HELP LINE REPORT

DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES

DATE: June 19 19 73

TIME: _____ AM PM

RECEIVED
JUN 26 1973
SANITARY ENGINEERING DIVISION

NAME OF CALLER: Mr. Jim Colley

ADDRESS: 4607 Carolina Beach Road
Street P.O. Box

Wilmington, North Carolina
City Zip

TELEPHONE NUMBER: _____

POINT OF POLLUTION: _____

SOURCE OF POLLUTION: The complainant reports that the garbage pick-up trucks owned by the City of Wilmington are littering the city streets with garbage.

NATURE OF CALL: This matter has been reported to County Health Officials; however, no action has been taken to date.

REPORT REFERRED TO: Sanitary Engineering Division, State Board of Health

IMMEDIATE ACTION TAKEN: _____

SIGNED Jackie Hall

COPY TO MR. MARSHALL STATON

Usual Files

WARREN O. STILES, P. E. & ASSOCIATES
CONSULTING ENGINEERS

P. O. BOX 437
WRIGHTSVILLE BEACH
N. C. U. S. A. 28480

TELEPHONE
BUS. (919) 256 - 3778
RES. (919) 256 - 3146

RECEIVED
MAY 29 1973
SANITARY ENGINEERING DIVISION

May 24, 1973

New Hanover County Commissioners
The Honorable Michael C. Vaughan, Chairman
The Honorable Vivian Wright
The Honorable Peter Davis
The Honorable Michael Hall
The Honorable W. Douglas Powell
New Hanover County Courthouse
Wilmington, North Carolina 28401

Subject: Solid Waste Management for New Hanover County

2 tr

Gentlemen:

Thank you for permitting me to present the film "Clean Town, USA" by the Black-Clawson Company at the regular meeting of the board, Monday, May 21, 1973.

Please allow me to reiterate:

> The county badly needs today a preliminary planning study for best total cost over the ensuing years.

A budget of about should be set aside in the upcoming budgetary period for study of this nature.

Naturally, I would like to be considered among those qualified local proffessionals qualified to head up such a study.

Yours very truly,

Warren O. Stiles

Warren O. Stiles

WOS/tlr

New Hanover
Lox

January 19, 1973

Mr. J. A. Dewar
Pesticide Manager
W. R. Grace & Co.
Agricultural Chemicals Group
Wilmington, North Carolina 28401

Dear Mr. Dewar:

This office is in receipt of your letter of January 16, 1973 concerning the disposal of 2,500 bushels of seed corn that has been treated with 75 percent Captan and one percent Malathion, at the rate of one ounce per 56 pounds.

There is no objection to the seed being placed in a sanitary landfill provided they are covered immediately with at least six inches of compacted earth.

If we can be of further assistance, please let us know.

Sincerely,

O. W. Strickland, Program Chief
Solid Waste Management Program
Solid Waste & Vector Control Section
Sanitary Engineering Division

OWS:clf

cc: Mr. Terry F. Dover
Mr. W. H. Cranford

P-A-G DIVISION W. R. Grace & Co.
AURORA, ILLINOIS 60507

HYBRID FIELD CORN SEED **NET WT. 56 LBS.**

NOTICE: See reverse side of tag for treated seed information and limitation of liability.

SEE BACK OF PLANTER PLATE TAG FOR PLATE SUGGESTIONS COLUMN ↓

		VARIETY	LOT NO.	ORIGIN	GERMI-NATION %	DATE TESTED	FLAT
PURE SEED	99%	SX29	2092	KY	95	JAN 70	4
INERT MATTER	1%						
OTHER CROP SEED	NONE						
WEED SEED	NONE						
NOXIOUS WEED SEEDS	NONE	SINGLE CROSS					

MINN. SEED TAX PERMIT NUMBER 27, ILL. 477, IOWA 24, MO. W13750, SO. DAK. 169

LIMITATION OF LIABILITY

NOTICE TO BUYER: We warrant that seeds sold in this container have been labeled as required under State and Federal Seed Laws and that they conform to the label description. We make no other or further warranty, expressed or implied.

No liability hereunder shall be asserted unless the buyer or user reports to the warrantor within a reasonable period after discovery (not to exceed 30 days), any conditions that might lead to a complaint. Our liability on this warranty is limited in amount to the purchase price of the seeds.

CAUTION

This seed has been treated with 75% CAPTAN and 1% MALATHION at the rate of 1 oz./56 lbs. Do not use for FOOD, FEED, or OIL purposes. Avoid prolonged and repeated contact with skin. In case of contact, flush with water. For eyes get medical attention.

W. R. GRACE & CO.
AGRICULTURAL CHEMICALS GROUP
P. O. BOX 368 · WILMINGTON, N. C. 28401

GRACE

January 16, 1973

RECEIVED
JAN 17 1973
SANITARY ENGINEERING
DIVISION

Mr. O. W. Strickland
Board of Health
State of North Carolina
Sanitary Engineering Division
Raleigh, N. C. 27611

Dear Mr. Strickland:

We have on hand approximately 2,500-bushes of treated seed corn left over and unsalable from the 1970 season due to low germination and non-resistance to corn blight.

We need to dispose of these seed; therefore, we are asking your help in suggesting the best method. The insecticide and fungicide treatment on the seed was 75% Captan and 1% Malathion, at the rate of 1-oz. per 56-lbs. (sample treatment tag attached)

Thank you for your consideration and please let me hear from you as soon as possible.

Very truly yours,

W. R. GRACE & CO.
Agricultural Chemicals Group

J. A. Dewar
Pesticide Manager

JAD:kh

Attachment

Proposed, Never Constructed
5/22/95 psw #331

December 8, 1972

Mr. Henry Cranford
Sanitarian Supervisor
New Hanover County Health Department
Wilmington, North Carolina 28402

Dear Mr. Cranford:

The following information is submitted concerning a proposed sanitary landfill site off North Kerr Avenue in New Hanover County and proposed to be operated by Waste Industries.

On November 14, 1972, the site was observed by a member of the Solid Waste Section staff and at that time it was recommended to the proposed operator that he proceed with the requirements for site approval as required by Section IX of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal."

Yours truly,

Jerry C. Perkins, Deputy Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

JCP:clf

cc: Mr. Terry F. Dover

156

Inactive

N. C. STATE BOARD OF HEALTH
CHECK-OFF SHEET FOR PROPOSED SANITARY LANDFILL SITES

COUNTY New Hanover LOCATION N. Kerr Ave 1½ miles from city limits ACRES 100

PROPERTY OWNER Waste Industries PROPOSED OPERATOR Waste Industries

1. Is this site within the boundaries of a public water supply watershed? Watershed _____ YES ____ NO ✓
2. Does any portion of this site contain floodplain areas? YES ✓ NO ____
3. Are there public or private wells nearby that could be affected? YES ____ NO ✓
   Nearest well in feet 200 (Elaborate in Comments Section)
4. Are there springs present on the site? Number _____ YES ____ NO ✓
5. Will this site require dyking? YES ✓ NO ____
6. Will this site require piping of surface drainage? YES ____ NO ✓
7. Not precluding required boring information, does this site have adequate cover material for the sanitary landfill development? YES ✓ NO ____
8. Will this site require diversion of surface water? YES ✓ NO ____
   Receiving stream for surface drainage from site Smiths Creek
9. Will this site require extensive preparation, such as clearing? YES Partial NO ____
   (Elaborate in Comments Section)
10. Will this site require a new all-weather access road? YES ✓ NO ____
    (Elaborate in Comments Section)
11. Evaluate the following:

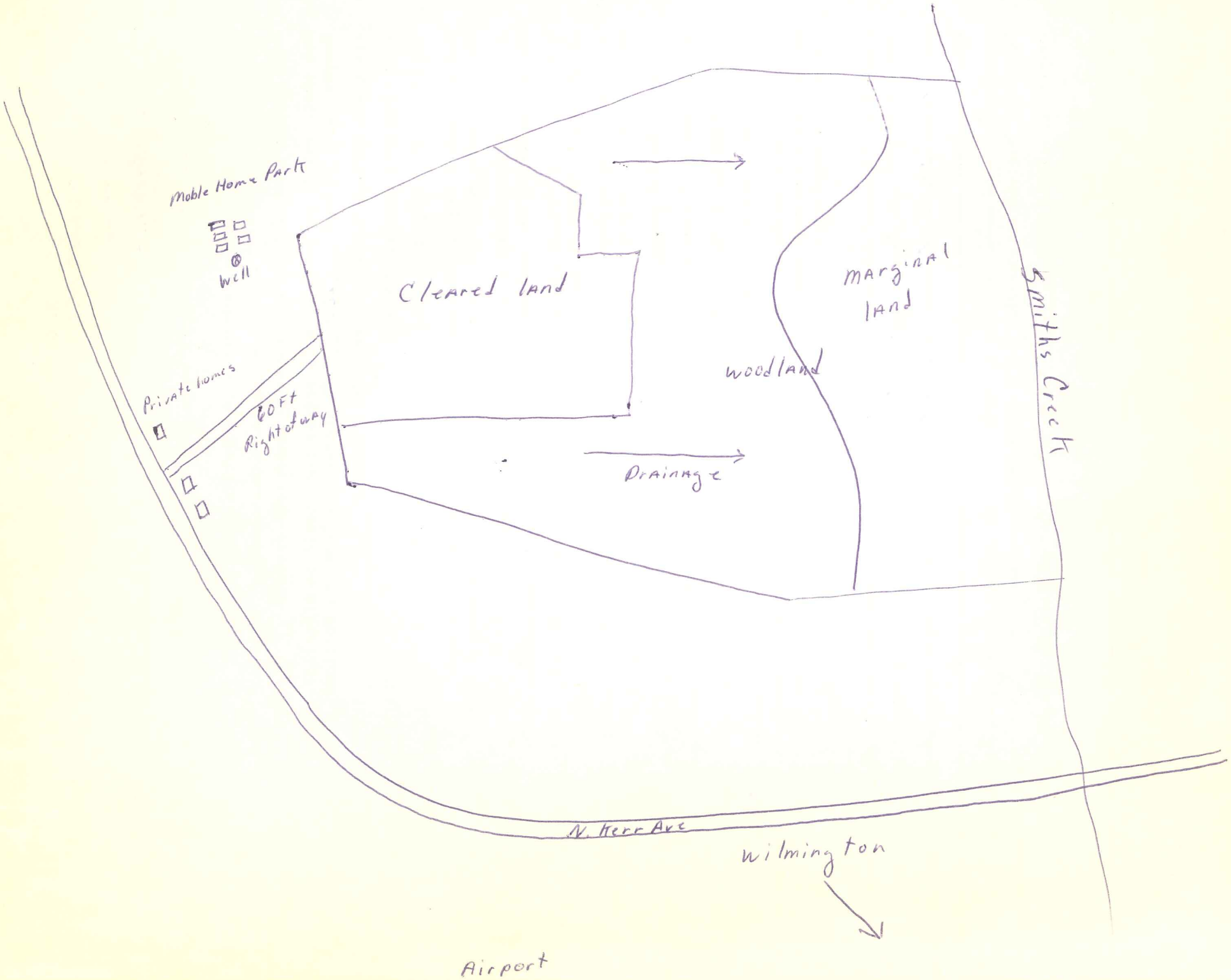
	POOR	GOOD	EXCELLENT
A. Surface soil conditions as related to cover requirements		✓	
B. Location as related to population density		✓	
C. Accessibility to users		✓	

12. Based on the observations made above and otherwise, do you recommend that the requestor proceed with the requirements of Section IX of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal"? YES ✓ NO ____
13. COMMENTS: (Include any requirements noted by you for the sanitary landfill development and operation) The closest private well is in a MHP located uphill from the property.
14. Number of borings recommended for a representative sampling of the site 10
15. Percent of usable land 70%. Include sketch of site on back of this form.

November 14, 1972
(DATE)

Terry F. Dover
N. C. State Board of Health
District Sanitarian for Solid Waste
or
Sanitary Engineer

SBH FORM 1350 (1/72)
Sanitary Engineering

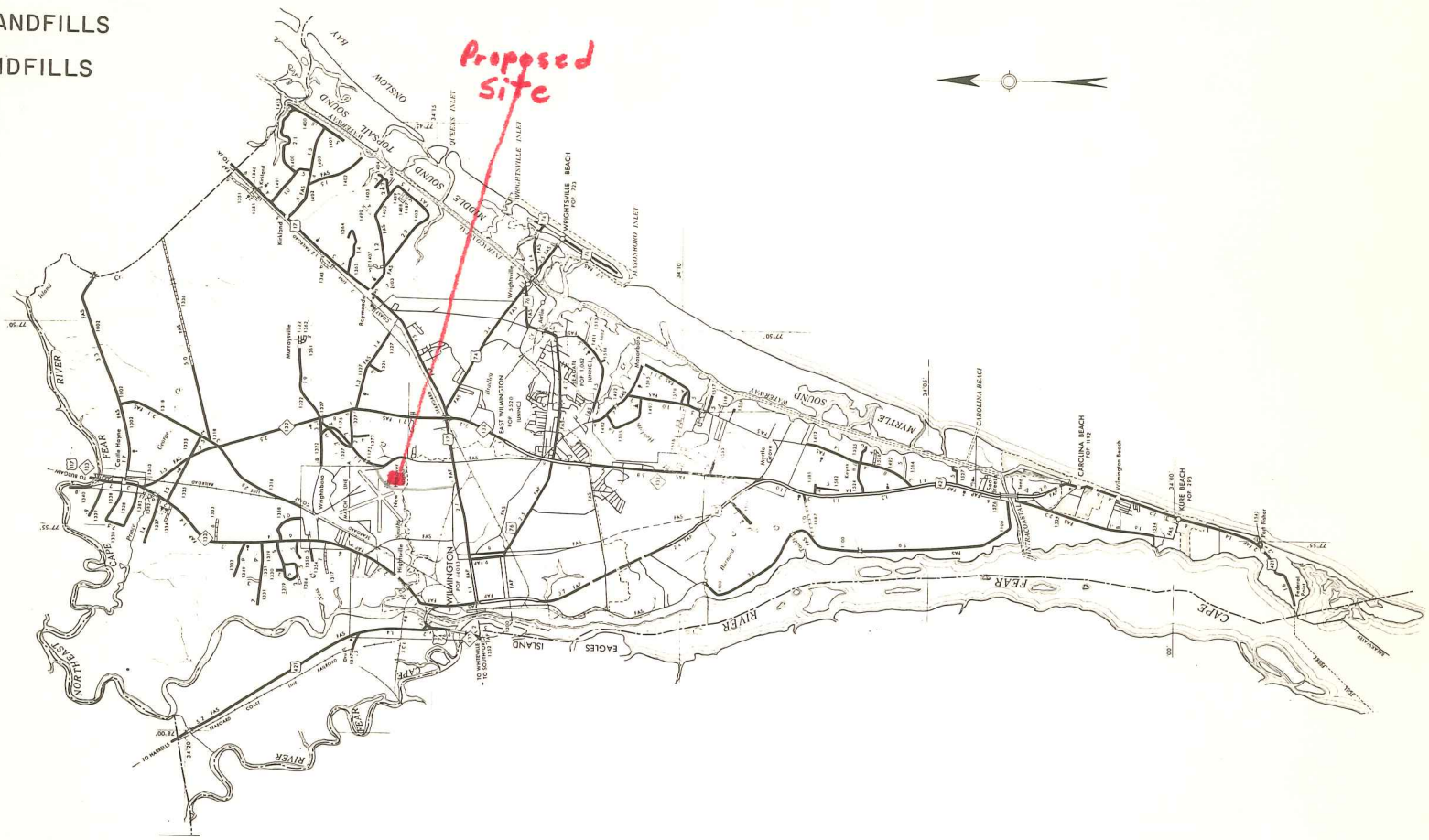

Mobile Home Park
well
Private homes
60 Ft
Right of way
Cleared land
Drainage
woodland
marginal
land
Smiths Creek
N. Kerr Ave
wilmington
Airport

LEGEND

PROPOSED LANDFILLS

EXISTING LANDFILLS

OPEN DUMPS



SCALE

1 0 1 2 3 4 MILES

0 0.5 1 MILE

SCALE FOR ENLARGEMENTS

NEW HANOVER COUNTY

NORTH CAROLINA

March 31, 1972

Mr. Lawrence Bowden
County Administrator
New Hanover County
Wilmington, North Carolina 28401

Dear Mr. Bowden:

The following is a list of companies who may be interested in solid waste collection and service for New Hanover County. There are possibly some locally whom we do not know.

1. Sanco, Inc.
   Winston-Salem, N. C.

2. Trash Disposal
   2828 Industrial Drive
   Raleigh, N. C.

3. Waste Industries, Inc.
   4208 Six Forks Road
   Raleigh, N. C.

4. Sanitation Services, Inc.
   c/o Jim C. Odum
   Lumberton, N. C.

If this office can be of any further assistance, please advise.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

JHS:jp

New Hanover

JHR

March 23, 1972

Mr. E. G. Long, Jr.
Chief, Engineering Division
Department of the Army
Wilmington District
Corps of Engineers
Post Office Box 1890
Wilmington, North Carolina 28401

Dear Mr. Long:

Reference is made to your request for the location of solid waste disposal sites located within the jurisdiction of the Wilmington District.

I understand that a member of my staff, Mr. Jerry C. Perkins, discussed this with you at a meeting in Raleigh on March 21, 1972, and explained to you some of the problems that might be involved in providing general information. The development of adequate and approved solid waste disposal facilities is progressing at a rather rapid rate and data that might be supplied now would be of no material value at a later date. With your approval, I believe it would be advantageous that we supply you with the information on solid waste disposal facilities on an individual project basis as I am sure the data would be more meaningful and more accurate.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1890
WILMINGTON, NORTH CAROLINA 28401

RECEIVED
MAR 6 1972
SANITARY ENGINEERING
DIVISION

1 March 1972

SAWEE

SANITARY ENGINEERING DIVISION
Mr. Marshall Staton
Director

Director
North Carolina State Board of Health
Raleigh, North Carolina 27602

Dear Sir:

In preparing environmental impact statements, we often need to know the location of solid waste disposal sites which may be affected. Please furnish us available information on the locations of all solid waste disposal sites within the Wilmington District. A District map is inclosed.

Sincerely yours,

FOR E. G. LONG, JR.
Chief, Engineering Division

1 Incl
As stated

1 March 1972

SAWEE

MAR 1972

Director
North Carolina State Board of Health
Raleigh, North Carolina 27602

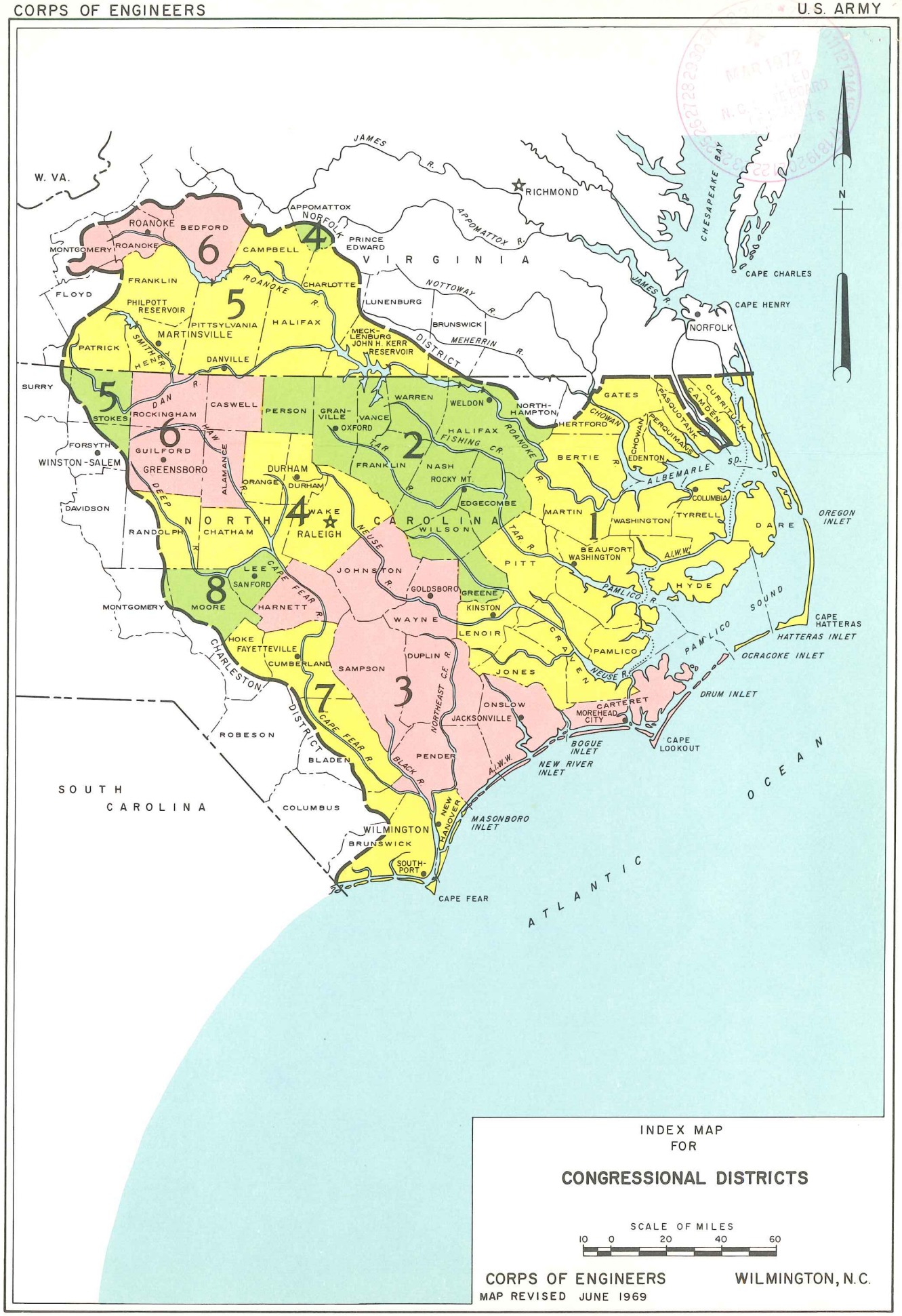
Dear Sir:

In preparing environmental impact statements, we often need to know the location of solid waste disposal sites which may be affected. Please furnish us available information on the locations of all solid waste disposal sites within the Wilmington District. A District map is inclosed.

Sincerely yours,

E. G. LONG, JR.
Chief, Engineering Division

1 Incl
As stated



INDEX MAP
FOR

CONGRESSIONAL DISTRICTS

SCALE OF MILES
10 0 20 40 60

CORPS OF ENGINEERS WILMINGTON, N.C.
MAP REVISED JUNE 1969

New Hanover

Office of Solid Waste Management Programs

March 17, 1972

Mr. Beverly Paul
Cape Fear Council ofGGovernments
Room 510
CP & L Building
Wilmington, North Carolina 28401

Dear Mr. Paul:

Enclosed for your reference is a checklist which you may find useful in preparing your application for a solid waste management planning grant; the checklist shows major items which must be considered in applications before they can be approved.

If this office can be of further assistance, feel free to call on us (Phone: 404/526-3454).

Sincerely yours,

/s/

HENRY T. HUDSON
Planning Officer

Enclosures (1)

cc: Mr. S.H. Usry (w/cpy of encl)

Planning Grant Application Checklist

Local - Regional

I. Administrative

_____ Date Received _____

Applicant & Type Loc.__ Reg.__ Grant Number _____

Follow-up

1. Face Sheet _____ _____

A. A. Grant No. Date _____

B. Budget Period _____

C. Signature _____

D. Eligibility:

Legal (Sec. 207 Provisions) _____

Sole Agency Documentation _____

	Map Check	Clearinghouse List Check
Part of Larger Region	Yes__No__	Yes__No__
Agreements or Resolutions of Cooperation		Yes__No__

2. Compliance (New)

3. Budget

A. Math Accuracy _____

B. Review _____

C. 75% - 25% _____

Follow-up

4. Fiscal Data (renewal - supplement) _____ _____

5. Narrative Included _____ _____

6. Biographical Information (new) _____ _____

7. File Folder Prepared (new) _____ _____

State Regional

8. Compliance with A-95 _____ _____

Application forwarded to grants administration office

Date _____

II. Priorities (Criteria Based)

1. The applicant is the "sole designated agency for solid waste management planning for the jurisdiction involved.

yes _____ no _____

This is a statutory requirement and application shall not be processed further until sole designation is established.

2. Applicant is an areawide agency or intends to pursue an areawide approach as a result of the planning program.

Areawide Agency _____ Areawide Intention _____

3. Applicant is a local agency representing a single "municipality" only.

yes _____ no _____

4. Applicant indicates a commitment to abandon open burning and open dumping practices. Documentation shall accompany the application.

Existing Ordinance or
Applicable Regulations _____ Resolution _____

5. Applicant has demonstrated a commitment for implementing its plan by cooperation in the planning with operating agencies. Evidence supporting this cooperation can include interagency agreements, resolutions of cooperation, contribution of funds or in-kind services, task force representation or other suitable participation by representatives of operating agencies within the planning jurisdiction.

_____ Over 50% governmental units and population represented.
_____ Over 50% of population represented.
_____ Over 50% of governmental units represented.
_____ Less than 50% of either governmental units and/or population represented.

6. The solid waste management plan for the State(s) in which the applicant jurisdiction is located has been accepted by the EPA Administrator.

yes _____ no _____

7. This State plan(s) has also been officially adopted by the governor of the State(s) involved.

yes _____ no _____

8. The applicant has made provisions for coordination with State regulatory and planning agencies.

yes _____ no _____

9. The applicant indicates that private solid waste management operations will be considered in formation of a plan.

yes _____ no _____

III. Technical

1. Application narrative shows a basic understanding of the solid waste management problem in the jurisdiction.

_____

2. The application contains a detailed comprehensive work program indicating tasks to be performed, initiation and completion dates of tasks, and assignment of responsibility for task completion by man-months or other suitable measure.

_____

3. The application must indicate a balanced and realistic approach to the solid waste management problem rather than pursuing a single, preconceived solution (e.g., barge or rail haul, recycle-reuse, incineration, etc.)

_____

4. Adequate methods for protecting all aspects of the environment must be specified as a work element in the planning grant application.

_____

5. Conservation of resources must be specified as a work element consideration in each planning grant application.

_____

6. The work program includes establishment of a public relation/information task at the program's inception.

_____

7. The applicant shows a capability to undertake solid waste management planning, through identification of a full time project director, if appropriate for the project size, and other appropriate support personnel.

_____

IV. General Considerations

1. Are the request grant funds appropriate for the proposed work program and size of planning jurisdiction?

Yes___ No___

Comment:

2. Does the work program specify performance of a comprehensive solid waste survey task on a logical sample basis using Local Analysis forms provided by the Environmental Protection Agency, Office of Solid Waste Management Programs?

Yes___ No___

Comment:

3. Have special survey proposals been reviewed to determine adequacy of study design and validity of sample selection as required?

Yes___ No___

Comment:

4. Does the application indicate a possible duplication of previous planning work except as needed to update necessary data?

Yes___ No___

Comment:

5. Has the applicant adequately explained any activities to be performed by a consultant?

Yes___ No___

Comment:

6. If a consultant is being used has the applicant submitted the proposed contract to EPA for review and approval as required prior to final execution between the grantee and consultant?

Yes___ No___ N/A___

Comment:

January 19, 1972

Mr. James C. Fox
New Hanover County Attorney
Murchison, Fox & Newton
16 North Fifth Avenue
Wilmington, North Carolina 28401

Dear Mr. Fox:

I am enclosing a copy of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal" as requested by you.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm
Enclosure

MURCHISON, FOX & NEWTON
ATTORNEYS AT LAW
16 NORTH FIFTH AVENUE
WILMINGTON, NORTH CAROLINA 28401
919 763-2426

WALLACE C. MURCHISON
JAMES C. FOX
LOUIS K. NEWTON

JOSEPH O. TAYLOR, JR.

SMITH BUILDING
SOUTHPORT N.C. 28461
919 457-6511

CARTER T. LAMBETH

RECEIVED
JAN 19 1972
SANITARY ENGINEERING
DIVISION

January 17, 1972

Sanitary Engineering Division
North Carolina
Board of Health
Raleigh, North Carolina 28401

Gentlemen:

We understand that you have a recommended model set of regulations for the collection and disposal of garbage. We would appreciate your forwarding such a copy of this model set to us.

Sincerely yours,

James C. Fox

James C. Fox
New Hanover County Attorney

JCF/jlm

New Hanover

City of Wilmington
NORTH CAROLINA
BOX 1810 28401

DIRECTOR
OF
PUBLIC WORKS

RECEIVED
OCT 13 1971
SANITARY ENGINEERING
DIVISION

October 11, 1971

Mr. Sid Usry
Sanitary Engineering Division
Solid Wastes Section
North Carolina State Board of Health
Raleigh, North Carolina 27602

Sent 10/14/71

Dear Mr. Usry:

Please send me six (6) copies of "Rules and Regulations Providing Standards for Solid Waste Disposal" (Bulletin No. 411) as enacted by the State Board of Health on March 11, 1971.

Thank you.

Yours very truly,

Robert F. Coleman, Jr.
Director of Public Works

RFC,jr.:az

Dwl Hanover
SOK

August 24, 1971

Mr. R. M. Jackson
Post Office Box 1890
Wilmington, North Carolina 28401

Dear Mr. Jackson:

I am attaching a copy of maps of Durham, Chatham, and Wake Counties that were requested by you in our telephone conversation. I have indicated on these maps the locations of the solid waste areas that we have on our records. At the present time, we have them classified as open dumps.

Plans have been prepared and submitted to both Chatham and Wake County officials for a satisfactory solid waste disposal program that will meet the requirements of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal." The plan in Chatham County will consist of one sanitary landfill that will serve the entire county in conjunction with a containerized system for the storage of solid waste. A similar plan has been presented to Wake County and the implementation of two recommended sanitary landfills is in process. In the above named counties, this plan will eliminate the open dumps which will be compacted and covered. At the present time, no plan has been formulated for Durham County.

If I can provide you with additional information, I shall appreciate hearing from you.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm
Attachments

✓ New Hanover

SF
R

August 6, 1971

Mr. Thomas Davis
5326 Autumn Drive
Wilmington, North Carolina 28401

Dear Mr. Davis:

In reply to your letter of August 1, 1971, I am unable to provide you with the information that is required for sanitary landfill operation as specified in the Rules and Regulations Providing Standards for Solid Waste Disposal. The regulations were adopted on March 11, 1971, and it will be noted that certain specified dates were made that parts became effective. The information you sought became effective on July 1, 1971, and at the present time, this information has not been provided by the City of Wilmington. I am sure that they are aware of this requirement and this information will be provided at a future date. I do not have an aerial photograph of the operation but it is possible that the Soil Conservation Service may be able to provide you with this information.

I appreciate your interest in this program and would appreciate receiving a copy of your paper.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm

RECEIVED
AUG 4 1971
SANITARY ENGINEERING
DIVISION

Wilmington
Aug. 1, 1971

Dear Mr. Usry,

I have for some time suspected that the New Hanover County sanitary landfill was being run improperly. I am now writing a paper on the subject which I intend to present to the County Health Department. The paper is an evaluation of conditions at the landfill and recomendations on how they may be improved. While looking through a copy of <u>North Carolina State Board of Health Rules and Regulations Providing Standards for Solid Waste Disposal</u>, I found that the operator of a landfill was required to submit to the State Board of Health certain information containing maps, aerial photographs, geological formations, water table, source of cover material, identification of adjacent watercourses, operation

in section IX. Would you please (if you are allowed to do so) convey this information to me, including whatever special rules (if any) the State Health Dept. placed upon this particular landfill? I am also in need of an aerial photograph of it in operation, if you could supply me with one. It is necessary that I receive the information by August 9 since I will be presenting my paper on the 10th and will need time to get it finished up and printed. I shall be sure to send you a copy. I would greatly appreciate it if you could help me. I am sorry that I am requesting this at such a late date and hope you will have time to prepare something.

Sincerely,

Thomas Davis
5326 Autumn Dr.
Wilmington, N.C. 28401

July 22, 1971

Mr. W. H. Cranford
Director Environmental Health
Consolidated Board of Health
New Hanover County & City of Wilmington
21 North Fourth Street
Wilmington, North Carolina 28401

Dear Mr. Cranford:

In reply to your letter of July 20, 1971, we will be glad to re-evaluate the solid waste disposal program for New Hanover County. As soon as arrangements can be made, I will notify you of the dates that this study will be made.

SOR

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm

Consolidated Board of Health
New Hanover County and City of Wilmington
21 NORTH FOURTH STREET
Wilmington, N. C.
28401

JOSEPH C. KNOX, M.D., M.P.H.
DIRECTOR

July 20, 1971

RECEIVED
JUL
SANITARY ENGINEERING
DIVISION

Mr. Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division
N. C. State Board of Health
Raleigh, N. C. 27602

Dear Mr. Usry:

Please re-evaluate our solid waste program in New Hanover County as early as possible. We have had many changes since our original survey was completed in 1968 and we are proposing to up grade our operation in the near future.

Thank you for your cooperation.

Sincerely,

W. H. Cranford
Director Environmental Health

WHC/cd

cc: Mr. Keith Oates
Mr. Laurence Bowden

✓ Neil Hunoder
lok

May 6, 1971

Mr. Tom Davis
5326 Autumn Drive
Wilmington, North Carolina 28401

Dear Mr. Davis:

In accordance with your request, I am enclosing a copy of the Solid Waste Law in addition to the "Rules and Regulations Providing Standards for Solid Waste Disposal."

This agency has no responsibility at the present time in regard to the Bald Head Island issue, so I do not have information on this subject.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm
Enclosures

Wilmington, NC
April 28, 1971

Dear Sirs,

Would you please send me a copy of whatever laws the state has concerning sanitary landfill. Do these laws pertain to city or county operated landfills? If not, do you know what laws Wilmington and New Hanover County have?

I would also like whatever information you have on the Bald Head Island issue.

Sincerely,

Tom Davis
5326 Autumn Dr.
Wilmington, N.C. 28401

RECEIVED
MAY 4 1971
SANITARY ENGINEERING
DIVISION

New Hanover

JHK

January 7, 1971

Coastal Zone Resources Corporation
4009 Oleander Drive
Post Office Box 848
Wilmington, North Carolina 28401

Attention: Mr. James M. Hudgens

Gentlemen:

I am mailing under separate cover the map of New Hanover County that gives the location of the present disposal areas within the county in addition to the proposed sanitary landfill sites that have been recommended by this agency. The proposed sites are to be operated as sanitary landfills in which the material will be covered on a daily basis.

The recommendations for sanitary landfill operations require that the sites be inspected and approved prior to operation in order to eliminate the possible pollution of ground or surface water. These sites will be routinely inspected by representatives of the North Carolina State Board of Health to assure compliance with accepted standards.

If I can provide you with additional information, I shall appreciate hearing from you.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

SHU:bm

COASTAL ZONE RESOURCES CORPORATION
A Subsidiary of Ocean Data Systems, Inc.
4009 OLEANDER DRIVE • POST OFFICE BOX 848 • TELEPHONE (919) 763-6569
WILMINGTON, NORTH CAROLINA 28401

DAVID A. ADAMS
President

MEMORANDUM TO: Advisory Committee Members
North Carolina Estuary Study

FROM: David A. Adams

The North Carolina Department of Conservation and Development has contracted to Coastal Zone Resources Corporation, a Pilot Demonstration in New Hanover County to test the "Plan for the North Carolina Estuary Study." The work is to commence immediately, and the completion date is slated to be on or before 15 May, 1971 for submission to the General Assembly.

We shall provide you with base maps for the transfer information as called for in the "Plan." We request that you complete and forward the information to us before 21 December, 1970.

Upon distributing the base maps, we shall contact you to work out final details of the data collection process.

We look forward to meeting with you again soon.

DAA/ch

RECEIVED
NOV 25 1970
SANITARY ENGINEERING
DIVISION

New Hanover
LHR

May 13, 1970

Miss Jane Divine
New Hanover High School
Wilmington, North Carolina 28401

Dear Miss Divine:

I am attaching the only copy that we have available of the "Survey Data and Proposed Management Program for Solid Waste in New Hanover County" that you requested in your letter. The New Hanover County Health Department can provide additional copies of this report.

I am also enclosing two copies of "Refuse Disposal by Sanitary Landfill" that may be of some interest to your group.

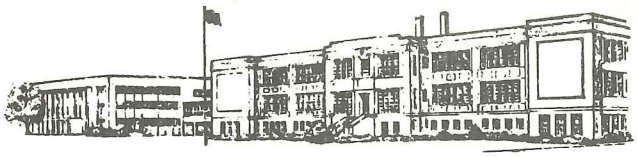
If we can provide you with additional information, I shall appreciate hearing from you.

Very truly yours,

Sidney H. Usry, Chief
Solid Waste and Vector Control Section
Sanitary Engineering Division

SU/mg

New Hanover High School



Wilmington, North Carolina
28401

May 5, 1970

Dear Sirs:

Our school is sponsoring an anti-pollution campaign in our community. Would you please send us as many copies as are available of "Survey Data and Proposed Management for Solid Waste Disposal in New Hanover County"? If you have any other free materials which may be helpful to us, we would gratefully appreciate them.

Thank you for your assistance.

Sincerely,
Jane Divine

RECEIVED
MAY 12 1970
SANITARY ENGINEERING
DIVISION

New Hanover
SOR

RONNIE SHAVLIK
PRESIDENT

Trash Disposal, Inc.

SERVING EASTERN NORTH CAROLINA

2828 INDUSTRIAL DRIVE TELEPHONE 919 828-9388
P. O. BOX 17507
RALEIGH, NORTH CAROLINA 27609

April 30, 1970

RECEIVED
MAY 4 1970
SANITARY ENGINEERING
DIVISION

Mr. Odell Strickland
North Carolina Department
of Sanitation Engineers
Raleigh, North Carolina

Dear Mr. Strickland:

Thanks for the courtesies extended me while in your office Wednesday. Our discussion of opportunities to improve solid waste disposal in North Carolina was quite interesting.

Your proposed idea for Dumpmaster Service in New Hanover County sounds very practical. We would be interested in handling two or four yard containers on the proposed route. Cost would be as follows:

	2 YD.	4 YD.
Once a week service	$ 24.00	$ 35.00
Twice a week service	35.00	53.00
Three times a week service	46.00	69.00
Four times a week service	58.00	87.00
Five times a week service	69.00	104.00
Six times a week service	80.00	121.00

As this number of containers would not warrant a full time truck, we could spread part of the cost of this truck to new accounts we could hopefully obtain in the area.

Also, we would be in a position to offer back-up service in the event our truck went down.

We are already organized in the Wilmington Area with a full time Manager, Mr. C. C. McKeithan, who is quite capable of performing

to quality standards that the New Hanover people would expect.

Mr. McKeithan would be happy to perform a detailed survey of the area under consideration with a representative of New Hanover County.

Sincerely,

TRASH DISPOSAL, INC.

Charles H. Russell, Jr.
Vice President

cm

cc: Mr. C. C. McKeithan, District Manager
Mr. W. H. Cranford, New Hanover County Sanitarian
Mr. E. C. Brandon, Jr., City Manager
Mr. Sid Ussery, Division Head, N. C. State Sanitation Div.