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Division Waste Management

Section Superfund

Program IHS (IHS)

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North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

October 8, 2010

Mr. Mike Ruffin
County Manager
200 East Main Street
Durham, North Carolina 27701

Subject: Pre-Regulatory Landfill Sites in Durham County

Dear Mr. Ruffin:

The General Assembly of North Carolina enacted Senate Bill 1492 which created a program to assess the public health and environmental hazards at landfill and dump sites that operated prior to 1983 and to develop and implement remedial action plans at sites requiring remediation. The Pre-Regulatory Landfill Unit (Unit) was created in the Inactive Hazardous Sites Branch (IHSB) to oversee these activities. The purpose of this letter is to make you aware of the sites identified in your county and to provide general guidance of relevant state statutes.

Based on the information obtained by the Unit, the sites listed below tentatively qualify under Senate Bill 1492.

<i>ID Number</i>	<i>Site Name</i>	<i>Site Address</i>
NONCD0000290	Old Durham County LF	Exum Road
NONCD0000292	Duke and Gregson St. Dump	Duke and Gregson
NONCD0000289	Durham County Landfill	1245 Wren Road
NONCD0000805	W. C. Beck Property	Amberley Drive
NONCD0000787	Rocky Knoll School Site	Cheek Roac
NONCD0000786	Marberry	Cheek Road
NONCD0000785	Mitchell Farm	Off Cheek Road
NONCD0000291	Durham Land Disposal Area	North Camden Road

Work at these sites may be performed using the Unit's resources or through local government actions. The Unit has prioritized the sites statewide based on their threat to public health and the environment and will perform assessments and implement remedial actions based on this priority. Local governments may opt to perform the work at any time under the guidance of the Unit. Reimbursement of local government costs may be available for assessments and remedial actions to abate an imminent hazard as funds are available. The conditions for reimbursement include approval of the assessment and remediation plan by the Unit and certified accounting of costs. A document, *IHSB Guidelines for Addressing Old Landfills & Dumps*, was developed to assist local governments and the Unit in this work. It is available on our web site, <http://portal.ncdenr.org/web/wm/sf/ihs/ihsoldlf>, for your review.

An additional purpose in notifying you of these sites is to provide information to assist in your responsibilities in the permitting of private drinking water wells. The General Assembly enacted legislation which required local health departments to implement programs for the permitting, inspecting, and testing of private drinking water wells by July 1, 2008. State well construction standards in 15A NCAC 2C require a minimum horizontal separation of 500 feet between a water supply well and a landfill or disposal site. More precise location information for the sites in your county may be requested from the Unit.

If you are aware of additional sites, have additional information on the identified sites, or need further information, please email me at analee.thornburg@ncdenr.gov or you can call Bruce Lefler at (919) 508-8463

Sincerely,

A handwritten signature in black ink that reads "Analee Thornburg". The signature is written in a cursive, flowing style.

Analee Thornburg
Pre-Regulatory Landfill Unit
Inactive Hazardous Sites Branch
Superfund Section

cc: Ms. Gayle Harris, Health Director – 414 East Main Street, Durham, NC 27701



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

February 26, 2007

<SAL> <FIRST> <LAST>, County Manager
County of <MUNICIPALITY>
<ADDRESS>
<TOWN>, North Carolina <ZIP>

Subject: Assessment, Cleanup, and Redevelopment of Old Landfill Sites Within Your Jurisdiction

Dear <SAL> <LAST>:

Governor Easley released his proposed budget February 22, 2007. Included in the budget is a specific item I believe should be of interest to you from a fiscal, environmental and public health protection perspective.

There are approximately 700 old landfills statewide and <LANDFILL#> old landfills in your local area that closed before the State permitting system became effective. These landfills are listed on the Old Landfill Sites portion of the Inactive Hazardous Sites Inventory maintained by the Superfund Section, Division of Waste Management. Any person, including local governments, that arranged for disposal or disposed of waste in the landfills may be held liable for the cleanup of the site. I have attached a report that identifies the location of known old landfill sites in <COUNTY NAME> County that may have closed prior to 1983 and thus qualify for the program described in this letter.

The Division has surveyed old landfills in 47 counties. The results of the survey indicate reason for concern about potential public health and safety impacts of these sites if they are not addressed. Seventy percent of the sites surveyed had a school, church, residence, day care or drinking water source within 1000 feet. The Division has found 102 old landfills that have a drinking water well within 500 feet. Thirteen of the landfills surveyed have residences built over the old landfill. The cost of assessment and cleanup of these old landfill sites can be as high as several million dollars.

Governor Easley's budget establishes a partnership between the State and local governments to both clean up the old landfill sites and provide funding for redevelopment of the sites. Many are in prime locations for redevelopment opportunities. The Governor's budget proposes to pay for cleanup and redevelopment of these sites through a surcharge on disposal of solid waste. The funding mechanism is a fair one. It is based on the idea that those who use solid waste disposal facilities should share responsibility for cleanup of sites used for solid waste disposal in the past that may have been lawful at the time, but did not meet standards that we now know are necessary to protect public health and safety.

The proposed \$2.00 per ton disposal surcharge would apply to residential, commercial, industrial, and construction and demolition debris type waste that is either disposed at a landfill or passes through a transfer station for disposal out-of-state. The State would use revenue from the surcharge to contract for cleanup of the old landfill sites and to provide grants to local government for redevelopment. The funds could also be used across the state to clean up other hazardous substance disposal sites that have no viable responsible party.

The only tool currently available to the State to ensure cleanup when it is needed is an enforcement action against those who owned, operated, or contributed to old landfills. The Governor's proposal would avoid placing an unreasonable

burden on any one local government and allow us to use our resources for actual cleanup rather than legal action. When old landfill sites were in use, North Carolina citizens, businesses, and industries benefited from their existence as a place to dispose of waste. The surcharge on waste disposal is a way for citizens, businesses, and industries to form a partnership for cleanup and redevelopment of these old landfill sites.

There is great interest this session of the General Assembly in strengthening requirements for landfills permitted in North Carolina. I encourage you to take a close look at legislation that will be introduced, specifically this initiative and what it can bring to your jurisdiction.

If you have questions regarding the program for clean-up of old landfills, please contact Jack Butler, Chief of the Superfund Section, at jack.butler@ncmail.net or call (919)508-8450.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dexter R. Matthews".

Dexter R. Matthews, Director

cc: David Thompson, NCACC
Jack Butler, Chief – Superfund Section



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

February 27, 2007

<SAL> <FIRST> <LAST>
<TITLE>, <MUNICIPALITY>
<ADDRESS>
<TOWN>, North Carolina <ZIP>

Subject: Assessment, Cleanup, and Redevelopment of Old Landfill Sites Within Your Jurisdiction

Dear <SAL> <LAST>:

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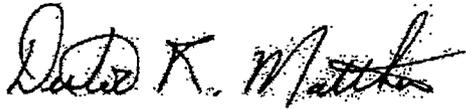
1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone 919-508-8400 \ FAX 919-715-3605 \ Internet <http://wastenotnc.org>
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burden on any one local government and allow us to use our resources for actual cleanup rather than legal action. When old landfill sites were in use, North Carolina citizens, businesses, and industries benefited from their existence as a place to dispose of waste. The surcharge on waste disposal is a way for citizens, businesses, and industries to form a partnership for cleanup and redevelopment of these old landfill sites.

There is great interest this session of the General Assembly in strengthening requirements for landfills permitted in North Carolina. I encourage you to take a close look at legislation that will be introduced, specifically this initiative and what it can bring to your jurisdiction.

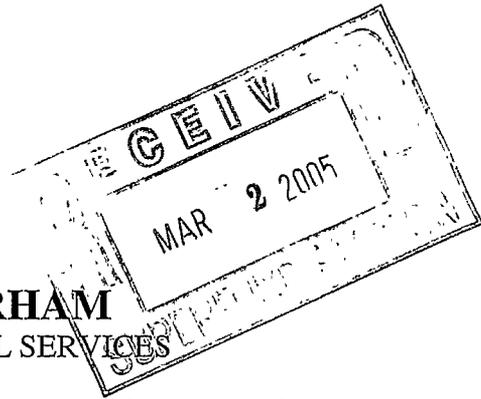
If you have questions regarding the program for clean-up of old landfills, please contact Jack Butler, Chief of the Superfund Section at jack.butler@ncmail.net or (919) 508-8450.

Sincerely,

A handwritten signature in black ink, appearing to read "Dexter R. Matthews". The signature is fluid and cursive, with the first name "Dexter" being more prominent.

Dexter R. Matthews, Director

cc: Ellis Hankins, NCLM
Jack Butler, Chief – Superfund Section



COUNTY OF DURHAM
DEPARTMENT OF GENERAL SERVICES

MICHAEL O. TURNER
Director

DONALD HASSELBACH
Assistant Director

February 28, 2005

Cheryl Marks
Inactive Hazardous Sites Branch Superfund Section
NC Division of Waste Management Branch
401 Oberlin Road
Raleigh, NC 27605-1350

Re: Sanitary Landfill History in Durham County

Dear Ms. Marks:

I am responding to your request for information dated January 31, 2005, on behalf of Durham County Manager, Michael Ruffin.

Having been a member of Durham County Government staff since 1976, with the responsibility of solid waste management, I have access to historical records, knowledge and past personal experiences with the County's solid waste history.

I have reviewed the database information you forwarded for all known old landfills/dump sites in Durham. As you requested, I have made additional notations to update the six sheets you forwarded. I am also including additional information chronologically on old unlined landfills that are not subject to the Division of Waste Management, Solid Waste section post-closure regulations that were not included in your database.

Until 1984, the City and County of Durham operated two separate waste disposal facilities. I have communicated with City staff and have enclosed their response to three of the sheets you forwarded.

To the best of my knowledge and records, the history of Durham's solid waste facilities is as follows:

DURHAM COUNTY

- Pre-1950** Solid waste was disposed of by private collectors on the personal property of Mrs. W.C. Beck of Route # 5, Box 241, Durham, at a charge to the county of \$5.00 per month. See the enclosed letter dated January 6, 1946.
- 1950-1953** The 1st Durham County landfill was located on "the Mitchell farm" off Fish Dam Road (Now Cheek Rd). See enclosed documentation entitled "Solid Waste Disposal Program – April 1947 through October 1969."
- 1953-1958** The 2nd county landfill was located on the "N. M. Marbery" property on Cheek Road.

310 South Dillard Street, Durham, North Carolina 27701-3744
Voice (919) 560-0430 EOE FAX (919) 560-0438

- 1958-1966** The 3rd county landfill was located on the "old Rocky Knolls school site", adjoining the Marbery landfill on Cheek Road.
- 1966-1966** Temporary arrangements were made with the Town of Chapel Hill from July 1966 until October 1966 for the disposal of Durham County's solid waste.
- 1966-1970** The 4th county landfill was located on Wren Road, your ID# NONCD0000289.
- 1970-1984** The 5th and last county landfill was located on Exum Road, off Redwood Road. At this location 3 separate sanitary landfills were permitted on the 100 acre tract of land by the State, your ID #'s NOCCD0000290 and ID # NONCD0000293.

In 1984 when the landfill on Exum Road closed, the County merged with Durham City due to the lack of availability of land and new permitting requirements.

DURHAM CITY

- Pre-1964** The City of Durham operated an incinerator for the disposal of residents waste.
- 1964-1974** The 1st City landfill was located on Camden Avenue, your ID # NOCCD0000291.
- 1974-1998** The 2nd City landfill was located on Club Boulevard, your ID # NONCD0000294.
- 1998-Present** The City opened a transfer station for the disposal of all city and county waste, which is transferred out-of-state to Virginia.

I hope this information is helpful. Let me know if you need any additional information.

Sincerely,



Michael Turner
Director of General Services

Cc: Michael Ruffin, County Manager
Carolyn Titus, Deputy County Manager
Don Hasselbach, Assistant General Services
Larry Dixon, Waste Reduction Supervisor



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

January 31, 2005

Mr. Michael Ruffin
County Manager
Government Administration Complex, 2nd Floor
Durham, North Carolina 27701

Re: Request for Information on old unlined landfills, Durham County.

Dear Mr. Ruffin,

The Division of Waste Management, Superfund Section, Inactive Hazardous Sites Branch (Branch) is in the process of cataloging old landfills in the state. This letter is being sent to you to solicit your cooperation in providing information on old unlined landfills that are not subject to Division of Waste Management, Solid Waste Section post-closure regulations in your county. This process is a part of a statewide effort to accurately inventory old dumpsites to aid in safe reuse and to protect public health and the environment.

Once an old landfill site has been identified, the site location, site usage, and vicinity usage is researched. Potential hazards to the public and the environment are then evaluated by risk assessment. Sites then are reviewed based on risk and/or by safe redevelopment requests.

The Branch then works with owners and responsible parties on final solutions for containment of the waste and to ensure safe reuse of the old landfill sites. Safe reuse might involve engineering controls to prevent exposure to wastes, if necessary, and restrictive covenants limiting the property to certain uses and setting conditions for construction or other soil disturbing activities. Annual reporting that restrictive covenants remain in place will be a duty of the current owner.

Known old landfills/dump sites are maintained in a database. Attached is a listing of known sites located in your county. Available information that may include location and years of operation information for each site is also listed. Please review the list and verify or provide information that will more accurately characterize the site(s). If you have knowledge of sites not included on the list, please add the additional sites along with location information, directions, years of operation, and any additional notable information.

Please return the list and any additional information within 90 days to:

Cheryl Marks
Inactive Hazardous Sites Branch
Superfund Section
NC Division of Waste Management
401 Oberlin Road - Suite 150
Raleigh, NC 27605-1350

Or you may email me with your response at Cheryl.Marks@ncmail.net or call with any questions concerning this request at (919) 733-2801, extension 283. Thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script that reads "Cheryl Marks".

Cheryl Marks, Hydrogeologist
Inactive Hazardous Site Branch
NC Superfund Section

Old Landfill Inventory - Location Information

Latitude/Longitude and other data in this report is highly subject to inaccuracies. State Plane coordinates replace latitude/longitude entries as data is collected. These coordinates may also be subject to error.

COUNTY: DURHAM

Site Name:	CITY OF DURHAM LF	In IHS Inventory?	No
ID Number:	NONCD0000294	Other Agency Lead	
Site Address:	CLUB BLVD	NFA or NFA-Restricted Use?	No
City:	DURHAM	Unable to Locate	<input type="radio"/>

State Plane X:	Latitude:	36.0286
State Plane Y:	Longitude:	-78.8705

Directions: SR 1636 (JIMMY GLENN RD) TO CLUB BLVD, OFF I-85

LDFL Size (Acres): 96 Property Size (Acres): 96 Date Open: Date Closed:	Present Within 1000 ft of Ldfl		
	Church	No	Residence On Ldfl? No
	School	No	Potable Well Within 500 ft? No
	Day Care	No	Adjoins Perennial SW? No
	Residential	No	

Notes: PERMIT # 32-03

(End Site Record)

Site Name:	DUKE AND GREGSON ST. DUMP	In IHS Inventory?	No
ID Number:	NONCD0000292	Other Agency Lead	
Site Address:	DUKE & GREGSON	NFA or NFA-Restricted Use?	No
City:	DURHAM	Unable to Locate	<input type="radio"/>

State Plane X:	Latitude:	36.0134
State Plane Y:	Longitude:	-78.9102

Directions: 500 BLOCK OF GREGSON ST TO YMCA AREA

LDFL Size (Acres):	Present Within 1000 ft of Ldff		Residence On Ldff?	No
	Property Size (Acres):	Church		
Date Open:	School	No	Adjoins Perennial SW?	No
Date Closed:	Day Care	No		
	Residential	No		

Notes: ABOVE GROUND DUMPING ONLY? COMPLAINT OF DUMPING IN CREEK ALONG GREGSON ST FROM 500 BLK TO PAST YMCA.

(End Site Record)

Site Name:	DURHAM COUNTY LANDFILL	In IHS Inventory?	No
ID Number:	NONCD0000289	Other Agency Lead	
Site Address:	WREN RD	NFA or NFA-Restricted Use?	No
City:		Unable to Locate	<input type="radio"/>

State Plane X:	Latitude:	35.9503
State Plane Y:	Longitude:	-78.8474

Directions: OLD 70 E, RT ON WRENN RD (SR 1955), 200 FT ON LFT

LDFL Size (Acres):	6	Present Within 1000 ft of Ldfll		Residence On Ldfll?	No
Property Size (Acres):	7	Church	No	Potable Well Within 500 ft?	No
Date Open:	1965	School	No	Adjoins Perennial SW?	No
Date Closed:	1970	Day Care	No		
		Residential	No		

Notes:

(End Site Record)

Site Name:	DURHAM COUNTY SANITARY LF	In IHS Inventory?	No
ID Number:	NONCD0000293	Other Agency Lead	
Site Address:	EXUM RD	NFA or NFA-Restricted Use?	No
City:		Unable to Locate	<input type="radio"/>

State Plane X:	Latitude:	36.0491
State Plane Y:	Longitude:	-78.7774

Directions: SR 1637 (REDWOOD RD) TO EXUM RD, OFF I-85. ALONG PANTHER CREEK. BETWEEN SR 1637 & JEFFERSON DAVIS HWY.

LDFL Size (Acres):	34	Present Within 1000 ft of Ldfl			
Property Size (Acres):	34	Church	No	Residence On Ldfl?	No
Date Open:	1969	School	No	Potable Well Within 500 ft?	No
Date Closed:	1987	Day Care	No	Adjoins Perennial SW?	Yes
		Residential	No		

Notes: PERMIT # 32-02. ADJOINS OTHER DURHAM COUNTY LDFL W/ SAME LOCATION DESCRIPTION?

(End Site Record)

Site Name:	DURHAM LAND DISPOSAL AREA	In IHS Inventory?	No
ID Number:	NONCD0000291	Other Agency Lead	
Site Address:	N CAMDEN AVE	NFA or NFA-Restricted Use?	No
City:	DURHAM	Unable to Locate	<input type="radio"/>

State Plane X:		Latitude:	36.0281
State Plane Y:		Longitude:	-78.8366

Directions: 1/4 MI FROM TOWN N ON CAMDEN AVE.

LDFL Size (Acres):	20	Present Within 1000 ft of Ldfl			
Property Size (Acres):	25	Church	No	Residence On Ldfl?	No
Date Open:	1964	School	No	Potable Well Within 500 ft?	No
Date Closed:	1974	Day Care	No	Adjoins Perennial SW?	No
		Residential	No		

Notes:

(End Site Record)

Site Name:	OLD DURHAM COUNTY LF	In IHS Inventory?	No
ID Number:	NONCD0000290	Other Agency Lead	
Site Address:	EXUM RD	NFA or NFA-Restricted Use?	No
City:		Unable to Locate	<input type="radio"/>

State Plane X:	Latitude:	36.0339
State Plane Y:	Longitude:	-78.7955

Directions: SR 1637 (REDWOOD RD) TO EXUM RD, OFF I-85. ALONG PANTHER CREEK.

LDFL Size (Acres):	13	Present Within 1000 ft of Ldfi			
Property Size (Acres):	13	Church	No	Residence On Ldfi?	No
Date Open:		School	No	Potable Well Within 500 ft?	No
Date Closed:	1981	Day Care	No	Adjoins Perennial SW?	Yes
		Residential	No		

Notes: ADJOINS PERMITTED LDFL W/ SAME LOCATION DESCRIPTION? CHEMICALS FROM SOUTH HIGH SCHOOL DISPOSED.

(End Site Record)

Number of Sites: 6 (End County Record)

Old Landfill Inventory - Location Information

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COUNTY: DURHAM

Site Name: CITY OF DURHAM LF	In IHS Inventory?	No
ID Number: NONCD0000294	Other Agency Lead	
Site Address: CLUB BLVD	NFA or NFA-Restricted Use?	No
City: DURHAM	Unable to Locate	<input type="radio"/>
State Plane X:	Latitude:	36.0286
State Plane Y:	Longitude:	-78.8705

Directions: SR 1636 (JIMMY GLENN RD) TO CLUB BLVD, OFF I-85

LDL Size (Acres): 96	Present Within 1000 ft of Ldf?	
Property Size (Acres): 96	Church	No
Date Open:	School	No
Date Closed:	Day Care	No
	Residential	No
	Residence On Ldf?	No
	Possible Well Within 500 ft?	No
	Adjacent Perennial SW?	No

Notes: PERMIT # 32-03

? Seems to be sanitary landfill @ 2115 E Club -

(End Site Record)

Jan 1, 1998
 - Closed - ~~official~~ official -
 - Look for official letter -

Permit #32-01

N. Newell

Site Name: DUKE AND GREGSON ST. DUMP In IHS Inventory? No
ID Number: NONCD0000292 Other Agency Lead
Site Address: DUKE & GREGSON NFA or NFA-Restricted Use? No
City: DURHAM Unable to Locate

State Plane X: Latitude: 36.0134
State Plane Y: Longitude: -78.9102

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	Residential	No		

Notes: ABOVE GROUND DUMPING ONLY? COMPLAINT OF DUMPING IN CREEK ALONG GREGSON ST FROM 500 BLK TO PAST YMCA.

(End Site Record)

- No information ^{or knowledge} available on this site.

Mike Sumner

Site Name:	DURHAM COUNTY LANDFILL	In IHS Inventory?	No
ID Number:	NONCD0000289	Other Agency Lead	
Site Address:	WREN RD	NFA or NFA-Restricted Use?	No
City:		Unable to Locate	<input type="radio"/>

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Date Open:	1965 1966	School	No	Adjoins Perennial SW?	No
Date Closed:	1970	Day Care	No		
		Residential	No		

Notes:

(End Site Record)

DURHAM COUNTY BOARD OF HEALTH

A.H. GRAHAM, JR. CHAIRMAN
A.H. LONDON, JR., M.D. VICE-CHAIRMAN
GUY R. WILLIS, D.D.S. CHARLES H. CHEWNING
RALPH P. ROGERS, JR. R. WENSELL GRABAREK
DEWEY S. SCARBORO



O.L. ADER, M.D., M.P.H.
DIRECTOR

DURHAM COUNTY HEALTH DEPARTMENT

300 EAST MAIN STREET

DURHAM, N. C. 27701

SOLID WASTE DISPOSAL PROGRAM, DURHAM COUNTY
April, 1947-October 1969

1947, April Although garbage pickups from residences and commercial establishments started earlier in Durham County, records in the Durham County Health Department reveal that permits had to be obtained from the Department and monthly reports made to it on number of customers served and number of pickups made by the "franchised" operators as far back as April, 1947.

1950, March There were three garbage collectors operating during this time (Messrs. Matthew Bynum, James Hill and Russell Jones). They disposed of the garbage in the City incinerator until about March, 1950 when they were given a one day's notice to cease using the City incinerator for disposal of garbage collected in the County.

Immediately after this, Mr. Jones leased a portion of land on the back side of the Mitchell farm, located just off Fish Dam (now Cheek) Road, near the Rocky Knoll School site east of Durham and about five miles from the City limit. Garbage and other household wastes were disposed of at this site, in an open dump, for about six months. At this time, there were 1,729 households and commercial places in Durham County subscribing to private garbage collections (Bynum 214, Hill 608 and Jones 907). This represented a County population of 6,053 being served (based on the Census Bureau's factor of 3.5 persons per family) and an annual accumulation of 4,363 tons of garbage (based upon the U.S. Public Health Service estimate of four pounds of garbage per person per day).

1950, Sept: In late September, the County purchased a new bulldozer and promptly started its first sanitary landfill operation on the same Mitchell farm. The County subleased the Mitchell site for Mr. Russell Jones and paid him a monthly sum for operation maintenance.

Within a few days after arrival of the bulldozer, Mr. Charles S. White, a Sanitary Engineer and Chief of the Insect and Rodent Control Section of the Sanitary Engineering Division, State Board of Health, came to Durham and instructed Mr. Jones and his bulldozer operator on where and how to cut trenches, stock-pile excavated soil, compact and cover garbage, etc. (These events are fresh in the writer's memory because he joined the department's staff on September 10, 1950 and was given the responsibility of supervising the garbage disposal program.)

1953, May. In late May, Mr. Mitchell died and on May 28, the Mitchell heirs gave Mr. Jones a day's notice to get out. It took several days to even find

an interim site and during this time Mr. Worth Ferrell who lived nearby allowed the collectors to dump in gullies on his property.

Finally, Mr. Jones received permission to use the N. M. Marbery property, also located off Fish Dam Road and about a mile nearer Durham. As early as February, 1954 this was found to be a poor site for the operation. Scavengers were found to abound which resulted in littered areas in the immediate community, e.g., burned out hot water heaters, worn out washing machines, old tires, etc., were dragged out of the landfill after its closing at 4:30 p.m. Also, dogs were accumulated by the owner of the property, purposely to feed in the landfill. As many as 40 dogs and goats were counted in and around it at the same time.

1958, Jan. The Marbery landfill site was abandoned in January, after a four year history of sloppy operation which resulted in countless complaints of too many mangy dogs in the community and winos hanging around the landfill site.

By now, officials of the County Department of Education (principally, Mr. Lester Smith, Business Manager) had agreed to let the County use the old Rocky Knoll School site for the sanitary landfill operation, as the area had been abandoned as a site for a new school. The Marbery property adjoined the school site, therefore, switching to the third site was no problem.

On January 1, 1958, the garbage collectors automatically lost 889 customers to the City Department of Sanitation due to annexation.

1958, June Mr. Russell Jones, who had been acting as supervisor of the sanitary landfill operations since September, 1950, resigned as of June 30, 1958.

Coincident with the announcement, Mr. Jones reported that practically all of the open land in the Rocky Knoll landfill site had been used up. However, Mr. Smith, agreed to have pulpwood cut on adjacent areas of the school property and this allowed extension of use of this site.

Meanwhile, the garbage collectors gradually gained new customers which replaced those lost to annexation six months earlier.

1958, Oct. On October 24, Dr. O. L. Ader, Health Director (effective August 1, 1958), accompanied the writer to the landfill site. The operation was found to be fairly satisfactory and the access road in better condition than on any previous visit.

1960, July On July 21, Mr. Warren Wicker, assistant director, Institute of Government, University of North Carolina, visited the sanitary landfill site. He was in the process of visiting all sites in the State to make general observations and evaluations which would be used in the preparation of a report the Institute was to make to the local Charter Commission.

Mr. Wicker was impressed with the general orderliness of the landfill operation, the use of some clean white, packer-type garbage collection trucks and

the low cost per ton needed for garbage disposal in Durham County.

1960, Oct. A contract garbage collector from Raleigh applied here for a permit to remove combustibile debris from Chemstrand in the Research Triangle Park and to dispose of same in Raleigh's landfill. The permit was denied on grounds that the Health Department would have no control over final disposal.

1962, Mar. On March 5, the Health Department's report to the Board of County Commissioners and County Manager covering garbage collection and landfill operations was as follows:

Total Number Customers served	4,301
Households and commercial places, 1 pickup weekly	3,744
Households, 2 pickups weekly	524
Commercial places, 2 pickups weekly	30
Commercial places, 5 pickups weekly	3

The above statistics represent a County population of some 17,000 persons served, and a disposal of an estimated 12,000 tons of garbage per year.

1962, Aug. A routine visit was made to the sanitary landfill on August 20. It was noted that scavengering was at a minimum and the facility, serving a population of about 18,000, was in a generally good condition.

1963, Apr. On April 1, the Departments' report to the County Commissioners on the garbage collection program was as follows: 4,609 customers served; an estimated 12,100 tons of garbage collected per year.

1966, May Several fires broke out at the landfill during May and June. All were believed to have been purposely started and all except one was handled without outside help. One fire believed started at night became uncontrollable, even with help from the fire department, due to the fire being in the garbage and debris covered by landfill dirt. After several days and failure of as many different methods to extinguish the underground fire, Mr. Sidney Usry of the State Health Department was called. He recommended procedures that promptly smothered the fire - by use of huge earthmovers and heavy rollers.

Later, Mr. Usry advised that the site be abandoned. With so much furor in the community and so little usable space left to continue, his advice was heeded and the County searched for a new site.

1966, July On July 5, the first dumping permits (punch cards) were picked up at Town Hall in Chapel Hill, for use by the Durham County garbage collectors.

Mr. E. S. Swindell, Jr., County Manager, had already completed negotiations with the town manager of Chapel Hill, that Durham County could use the Chapel Hill landfill for an interim period until a permanent site could be found in Durham County.

1966, Sept. On September 22, Mr. Swindell and the writer visited a 27-acre tract of land on the left and just off Wrenn Road, two miles East of Durham, to determine its suitability for use as a sanitary landfill. The County had already received from Chapel Hill officials an ultimatum to discontinue use of its facility not later than September 30, 1966.

On September 23, Mr. Usry visited the proposed site and concluded that about 10 of the 17 acres would be ideal for landfill use. He also gave Mr. Frank Gunter, owner of the property and landfill operation's contractor, detailed instructions on trenching, stockpiling, compacting, filling, etc.

1966, Oct. On October 3, garbage disposal for the County was switched from Chapel Hill to the new site 1/4 mile off Wrenn Road.

1966, Nov. On November 9 a delegation from the nearby Bilboa Community visited the Health Department, with a petition containing 85 signatures of persons who were protesting the location of the new garbage disposal site.

Mr. Usry was again asked to come over and evaluate the situation. His report stated that on inspection, the Durham County sanitary landfill was observed to be in a very good condition and operated in accordance with the original plan and recommendations.

1967, June On June 12, the landfill site was visited by Mr. Harry LeGrand and Mr. John Cash, geologists from the U. S. Geological Survey, Department of Interior, Washington, D.C., to determine whether some of the material from the Research Triangle that was being dumped into the landfill would be detrimental to ground water. Mr. LeGrand stated that this operation was on a par with the best operations they had visited so far.

1969, Mar. During March, surface fires got out of control several times at the landfill, and one time it actually spread and burned over several acres of nearby private wooded property. These events caused the County Manager and Health Director to take a harder look at the landfill operation and its proximity to the densely populated areas.

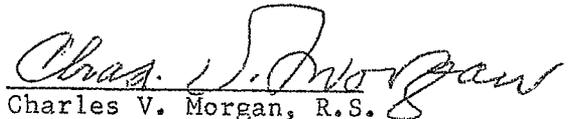
1969, Oct. The following statistics cover garbage and other waste collection and disposal made by the five operators:

<u>Operator</u>	<u>No. Customers</u>
Jones	3,940
McFarland	3,184
Daniels	425
Carolina Trash Removers*	4
Bynum**	1
Total	<u>7,554</u>

*Serves I.B.M., Hercules, Beaunit Fibers and Erwin Mills - all materials collected are highly combustible.
**Serves Chemstrand only.

Excluding the five industrial customers served by Mr. Bynum and the Carolina Trash Removers, the remaining 7,549 customers represent a County population of some 26,422 persons being served and a disposal of some 31,343 tons per year.

(The present formula for computing disposal tonnage is: No. of families \times 3.5 members \times 6.5 pounds each \times 365 days = 62,687,095 pounds, \div 2,000 = 31,343 tons. Note: The Public Health Service estimate of wastes created per person per day has been increased from 4 pounds in 1950 to 6.5 in 1969 - largely a result of increased use of aluminum and plastic containers for foods, soft drinks, beer, etcetera during the past few years.)



Charles V. Morgan, R.S.
Sanitarian Supervisor
(September 1950-June 1969)

SOLID WASTE DISPOSAL PROGRAM, DURHAM COUNTY
April, 1947-October, 1969
Durham, North Carolina

To Whom It May Concern:

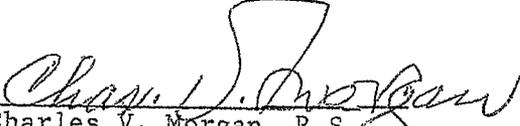
This is to certify that on September 10, 1950, I was employed by the Durham County Health Department as Chief of the Environmental Section of the Sanitation Division by the Health Director, Dr. J. H. Epperson.

The Director informed me that in addition to my supervisory responsibilities to the several sanitarians in the section, I would be fully responsible for supervision of the County's garbage collection and disposal program. These duties included routine visits to the authorized landfill site and the investigation and closure of any other dump sites located in the City or County of Durham. I was also responsible for investigating proposed landfill sites, for investigating the reliability of applicants for a collector's permit, for limiting the number of collectors and for seeing that they fulfilled their responsibilities to the customers they served and the landfill operation. I know the County's only authorized sanitary landfills were located two to five miles east of the city limits just off Cheek (formerly Fish Dam) Road, near and on the Rocky Knoll School site, and off Wrenn Road, its present site.

Records in the Health Department reveal that as far back as April, 1947 garbage collectors were required to obtain a permit and report monthly on the number of customers served and number of pickups made. In 1950, the County purchased a bulldozer and created its first sanitary landfill. There were then 1,729 household and commercial places in Durham County served by private garbage collectors. Of these, Messrs. Matthew Bynum served 214, James Hill 608, and Russell Jones 907.

Mr. Bynum has used the County's landfill without interruption since its start and has been a most conscientious and cooperative collector throughout. He emphatically denies that he asked for a permit to use a site in the Hope Valley section of the County for garbage disposal. I know this is true because I was never requested to investigate a proposed site in that area.

A chronological report on the County's garbage collection and disposal program from September 1950 through October 1969 is attached to this document.


Charles V. Morgan, R.S.
Sanitarian Supervisor
(September 1950-June 1969)

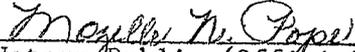
To Whom It May Concern:

This is to certify that I have been a member of the Durham County Health Department staff since April 24, 1944 and that I know the statements made by Mr. Morgan in this document and in his accompanying chronological account of the County's solid waste disposal program are based on records in file in this department.


O. L. Ader, M.D., M.P.H.
Director

The above named individuals are known to me to be the persons who signed and executed, under oath, the foregoing statements as true.

My Commission expires My Commission Expires March 19, 1971


Notary Public (Official Seal)

Site Name:	DURHAM LAND DISPOSAL AREA	In IHS Inventory?	No
ID Number:	NONCD0000291	Other Agency Lead	
Site Address:	N CAMDEN AVE	NFA or NFA-Restricted Use?	No
City:	DURHAM	Unable to Locate	<input type="radio"/>
State Plane X:		Latitude:	36.0281
State Plane Y:		Longitude:	-78.8366

Directions: 1/4 MI FROM TOWN N ON CAMDEN AVE.

LDL Size (Acres):	20	Facility Within 1000 ft of LDFI		Residence On Ldfi?	No
Property Size (Acres):	25	Church	No	Potable Well Within 500 ft?	No
Date Open:	1964	School	No	Adjoins Perennial SW?	No
Date Closed:	1974	Day Care	No		
		Residential	No		

Notes:

most likely is old dump that is underneath
 LCID Landfill
 (End Site Record)

Under LCID - landfill -
 32B

@ 1833 Camden Ave -

Post-It® Fax Note	7671	Date	2/18/05	# of Pages	2
To	Mike Turner	From	Nancy Newell		
Co./Dept.	County	Co.	City		
Phone #	0430	Phone #	4381		
Fax #	560-0438	Fax #	4479		



STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

HUGH H. TILSON, M.D.
DIRECTOR

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

P. O. Box 2091

Raleigh 27602

December 13, 1979

Mr. Wade Currin
Investors Group Company
P. O. Box 767
Durham, NC 27702

Dear Mr. Currin:

In reference to your company's rubble dump off South Roxboro Road, I understand that you called Mr. O. W. Strickland, of my office, a few weeks ago and stated that you were going to close out the landfill site. I recently made a visit to the site and found that the site had not been properly closed out. There had been some grading at the site but this was not complete. Also, the path had only been blocked with rubble and dumping of garbage was continuing on. A dead dog had been recently thrown out at the entrance to the site.

Without proper closing out of this site, the condition of the site only invites people to continue to dump as that is what the site is now -- an open dump, in violation of the N. C. Department of Human Resources' "Solid Waste Management Rules".

The following close-out requirements must be completed within the next 30-45 days:

1. Compact and cover existing solid waste and rubble on site with at least two feet or more of compacted earth.
2. Implement erosion control measures by grading and seeding.
3. Post signs indicating the dump site is closed.
4. Prevent access to the site via gate, ditching, or other appropriate barriers.

Another visit will be made after the previous mentioned deadline to determine compliance with the "Solid Waste Management Rules".

If you have any questions or if I may be of any assistance to you, do not hesitate to contact me.

Sincerely,

LDP:ns
cc: Mr. Terry F. Dover
Mr. O. W. Strickland

Larry D. Perry, District Sanitarian
Route 4, Box 344-E, Zebulon, NC 27597

South Carolina Department of Health and Environmental Control



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Malcolm U. Dantzler, M.D., M.P.H.
2600 Bull Street
Columbia, S.C. 29201

November 19, 1979

G.H. Pope
Monsanto Triangle Park Development
Center
P.O. Box 12274
Research Triangle Park, North Carolina 27709

IN RE: Disposal Approval for Laboratory Waste into ABCO Industries, Inc.
Spartanburg County

Dear Mr. Pope:

This office hereby grants approval for disposal of the above referenced waste at ABCO Industries, Inc., Roebuck, South Carolina. This is a one-time approval with the amount as described on Manifest #9-147 page 1 and 2 excluding number 15.

Transport of this material must be in such a manner to prevent spillage or leakage and must comply with all State Public Service Commission and Department of Transportation regulations. It is the responsibility of Monsanto Triangle Park Development Center and the hauler of the waste to ensure that adequate transportation vehicles are used.

The enclosed Manifest Form is to be used in conjunction with the disposal of this waste. Monsanto Triangle Park Development Center must fill out completely the appropriate portion of the form and return the pink copy to this office upon shipment of the waste. The yellow and white copies shall be sent with the waste when transported to the disposal facility with the remainder of the form completed by indicated parties. The disposal facility shall verify the accuracy of the Manifest and return the yellow copy to this office. This Division retains the right to sample any waste going to this site to ensure compliance with the Manifest.

Any changes in composition or volume of this waste, or if any problems are encountered during disposal, this authorization will be nullified. Also, this approval is only valid for disposal at the referenced site.

Your cooperation with this office is appreciated. If you have any questions, feel free to call on us.

Sincerely,

James R. Ullery

James R. Ullery, Environmental Engineer
Industrial Waste Section
Solid Waste Management Division

JRU/CDC/kk
cc: Bill Buffington
Ron Garrett
Charles Milford
✓ O.W. Strickland
Enclosure

1878

Century of Service 1978

Durham
Awd/c

November 6, 1979

Mr. Wade Currin
Inventors Group Co.
Box 767
Durham, NC 27702

Dear Mr. Currin:

This letter is to confirm the conversation you and I had on October 24, 1979, concerning the unauthorized dump site off South Roxboro Road. The purpose of the meeting was to familiarize your company with the complaints concerning the dump site and the necessary measures that must be taken to continue operation and permitting of this site.

If your company should decide not to continue operation of this site it must be properly closed out by compacting and covering the site with an appropriate layer of soil and seeding the site to prevent erosion.

Another visit will be made to the site within the next 4-6 weeks to determine compliance with the N. C. Department of Human Resources "Solid Waste Management Rules".

If you have any questions or if I may be of further assistance, do not hesitate to contact me at my Raleigh office, 733-2178.

Sincerely yours,

Larry D. Perry, District Sanitarian
for Solid & Hazardous Waste Management
Route 4, Box 344-E
Zebulon, NC 27597

LDP:ms

cc: Mr. Terry F. Dover
Mr. O. W. Strickland

October 16, 1979

Mr. Hubert Pickett
Director of General Services
101 City Hall Plaza
Durham, North Carolina 27701

LDP
Dear Mr. Pickett:

With reference to our telephone conversation this A.M., I am forwarding you a copy of the refuse disposal site guidelines.

I will contact you in a day or so to set up a date for inspection of the old city landfill site as a possible future refuse disposal site.

Sincerely,

Larry D. Perry, District Sanitarian for
Solid & Hazardous Waste Management
Route 4, Box 344-E, Zebulon, N.C. 27597

LDP:sms

South Carolina

Department of Health and Environmental Control

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Malcolm U. Dantzler, M.D.
COMMISSIONER

~~2600 Bull Street~~

2600 Bull Street

Columbia, S.C. 29201

September 28, 1979

Mr. Ralph E. Cool
Liggett & Myer Tobacco Company, Inc.
W. Main Street
Durham, North Carolina 27707

Jul 17 C
IN RE: Solvents and Ink Pigments -- Carolawn Company, Inc.
York County

Dear Mr. Cool:

This office hereby grants approval for disposal of the above referenced waste at Carolawn Company, Inc., in Ft. Lawn, South Carolina. Approval is contingent upon Carolawn receiving approval from the Bureau of Air Quality Control to operate the incinerator. Approval is for approximately 8,000 gallons per month of solvents and ink pigments as described.

Transport of this material must be in such a manner to prevent spillage or leakage and must comply with all State Public Service Commission and Department of Transportation regulations. It is the responsibility of Liggett & Myer Tobacco Company and the hauler of the waste to ensure that adequate transportation vehicles are used

The enclosed Manifest Form is to be used in conjunction with the disposal of this waste. Liggett & Myer Tobacco Company must fill out completely the appropriate portion of the form and return the pink copy to this office upon shipment of the waste. The yellow and white copies shall be sent with the waste when transported to the disposal facility with the remainder of the form completed by indicated parties. The disposal facility shall verify the accuracy of the Manifest and return the yellow copy to this office. This Division retains the right to sample any waste going to this site to ensure compliance with the Manifest.

Any changes in composition or volume of this waste, or if any problems are encountered during disposal, this authorization will be nullified. Also, this approval is only valid for disposal at the referenced site.

Your cooperation with this office is appreciated. If you have any questions, feel free to call on us.

Sincerely,



James R. Ullery, Environmental Engineer
Industrial Waste Section
Solid Waste Management Division

/kk

cc: Gary Hogue
Boyce Faulkner
Bob Riggs
D. W. Strickland

1878

Century of Service 1978



NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES
SOUTH CENTRAL REGIONAL OFFICE
225 GREEN STREET
WACHOVIA BUILDING — SUITE 506
FAYETTEVILLE, NORTH CAROLINA 28301



June 26, 1979

Mr. Felix Chandler
602 Pleasant Drive
Durham, NC 27703

AW VC
Dear Mr. Chandler:

This letter confirms the conversation Mr. Daryl Poe, Sanitarian with the Durham County Health Department and I had with you on June 21, 1979. The purpose of our meeting was to discuss your intentions in regard to the unauthorized solid waste disposal site you have been operating near the corner of Glover Road and Angier Avenue in Durham. You stated that it was your intention to now close the site and not permit any more dumping. You further stated that you had had trouble with individuals driving by the property and dumping household garbage on the site.

We agreed that closing the site at this time would be in the best interest of all concerned. Over the next 60 days you must cover your site with an adequate amount of earthen cover so that you can seed the area, fence the site to discourage illegal dumping and post signs stating that the site is closed.

Another visit will be made on or about August 21, 1979, to determine compliance with the N. C. Department of Human Resources Solid Waste Management Rules.

If you have any questions or if I may be of further assistance, do not hesitate to contact me.

Sincerely,

Terry F. Dover

Terry F. Dover
Eastern Program Supervisor
Solid & Hazardous Waste Management Program

TFD:chp
cc: Mr. O. W. Strickland
Mr. Daryl Poe

NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES
SOUTH CENTRAL REGIONAL OFFICE
225 GREEN STREET
WACHOVIA BUILDING — SUITE 506
FAYETTEVILLE, NORTH CAROLINA 28301

May 11, 1979



Rev. Thomas Elwood Davis
Box 11081 E. D. Sta.
Durham, NC 27703

DW
Dear Rev. Davis:

This letter confirms the meeting Mr. Andrew Robinson, District Sanitarian, and I had with you on Tuesday, May 8, 1979. The subject of our meeting was the closeout of your rubble site which is located at the end of Enfield Drive, Durham, N. C.

As was relayed to you, your site must be closed due to the fact that you are depositing solid waste in a flood plain area of a branch of North-east Creek. This area was so designated by the soil survey of Durham County which was completed in 1969 by the U. S. Soil Conservation Service.

The following close-out requirements must be completed by July 9, 1979:

1. Implement effective rat control including baiting for at least two weeks to prevent rat migration to adjacent property.
2. Compact and cover existing solid waste on site with at least two feet or more of suitable compacted earth.
3. Implement erosion control measures by grading and seeding.
4. Post signs indicating the dump site is closed.

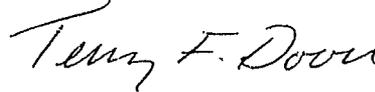
It was further understood that you will have to re-channel the branch around the solid waste because of the present blockage by your site of the branch.

Please find enclosed a copy of the N. C. Administrative Code entitled

Rev. Thomas Elwood Davis
Page Two
May 11, 1979

Solid Waste Management for your information. If you have any questions or if I may be of any assistance to you, do not hesitate to contact me.

Sincerely,



Terry F. Dover
Eastern Program Supervisor
Solid & Hazardous Waste Management Program

TD:cp

Enclosures

cc: Mr. Daryl G. Poe
✓ Mr. O. W. Strickland

NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES
SOUTH CENTRAL REGIONAL OFFICE
225 GREEN STREET
WACHOVIA BUILDING — SUITE 506
FAYETTEVILLE, NORTH CAROLINA 28301



May 11, 1979

Mr. Carl George
2721 Enfield Drive
Durham, NC 27703

AW 4/10
Dear Mr. George:

Please be advised that the solid waste disposal site located near your home on Enfield Drive and owned by Rev. Davis has been given notice of closure with a timetable of 60 days which will end on July 9, 1979.

As I relayed to you by telephone, it takes time to properly close out a site of this type. I hope that this information will help your situation.

Please do not hesitate to contact me if I can be of further assistance to you.

Sincerely,

A handwritten signature in cursive script that reads "Terry F. Dover".

Terry F. Dover
Eastern Program Supervisor
Solid & Hazardous Waste Management Program

TFD:chp
cc: Mr. O.W. Strickland

SAMPLE PREPARATION

THE SAMPLE WAS CRUSHED AND MIXED AND DRIED AT 180°C. A PORTION OF THE DRIED MATERIAL WAS WEIGHED AND DIGESTED IN NITRIC ACID AT ABOUT 140°C. THE DIGESTED SAMPLE WAS FILTERED THROUGH WHATMAN #1 PAPER, DILUTED WITH DISTILLED WATER AND ANALYZED FOR THE REQUESTED METALS.

October 11, 1978

Mr. Charles T. Mathews
Director of Operations
Southchem, Incorporated
750 East Maricham Avenue
Post Office Box 886
Durham, North Carolina 27702

DWSVC
Dear Mr. Mathews:

I am informed by Mr. Damon C. Antel, Chemist, who visited with you on October 9, 1978, that you have complied with the request to properly close out the landfill on your property.

Your cooperation in this matter is appreciated, and if this office can be of assistance in the future, please let us know.

Sincerely,

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

OWS/wss

cc: Mr. Frank H. Barr
Mr. Terry F. Dover



750 East Markham Avenue
Post Office Box 886
Durham, North Carolina 27702
(919) 688-8046

Check on



September 15, 1978

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

Dear Mr. Strickland:

I am writing concerning the close out of the dump located on Southchem's property in Durham, N.C.

The site has been covered with compacted earth and a dike has been placed to divert the surface water. The area is to be seeded and mulched today and tomorrow and should be ready for inspection at your convenience.

We appreciate the cooperation and guidance of your office in this matter.

Very truly yours,

A handwritten signature in cursive script that reads 'Charles T. Mathews'.

Charles T. Mathews
Director of Operations

CTM/dss





STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

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

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

P. O. Box 2091

Raleigh 27602

September 26, 1978

MEMORANDUM

Visited Southchem, Incorporated, on Monday, September 25, 1978, to check on the closing out of their dump on the property. The area appeared to be well-covered, generally well-graded although the bottom of the lower perimeter was a little steep. Also, the area had been well-seeded and covered with mulch.

The one deficiency noticed was that the dike that has been built to divert the water from the surface does not extend all the way around the top edge, but extends only about two-thirds of the way around from left to right and all the water runs down the side of the slope. A recent heavy rain has already cut a ditch a foot or more deep down this slope.

Advised Mr. Burgess to tell Mr. Mathews that this part of the project is not satisfactory. He should either run the diversion dike the rest of the way around and to the head of the ravine and then allow the water to flow away from that point, or he should have the contractor do a much better job of erosion control at the point where the water now is released. The former would be preferable.

Damon C. Antel

Damon C. Antel

3000 ~~Case~~ 7 (Case)
(24 3000 in a Case)

August 15, 1978

Mr. Charles T. Mathews
Operations Manager
Southchem, Inc.
Post Office Box 886
Durham, NC 27702

CTR
Dear Mr. Mathews:

This letter will confirm our agreement of August 9, 1978, with reference to the close-out of the dump on the property of Southchem, Inc., Durham, North Carolina.

The site is to be covered with at least two feet of compacted earth, the slope on the face of the fill shall be sloped so heavy equipment can compact the earth, a dyke will be placed at the top of the slope to divert all surface water, and the total area is to be seeded with the slope area mulched to prevent erosion.

Your cooperation in completing this close-out on or before September 15, 1978, is requested. Please notify this office when the work has been completed.

Southchem, Inc., shall in the future use only approved facilities for waste disposal.

Sincerely,

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

ONS:bm

cc: Mr. Frank Barr
Mr. Terry F. Dover

BILL STRICKLAND NC

RECORD OF COMMUNICATION

- PHONE CALL
- DISCUSSION
- FIELD TRIP
- CONFERENCE
- OTHER (SPECIFY)

(Record of item checked above)

TO: WIM SCARBROUGH

FROM: BILL STRICKLAND

DATE: 8/9/78
TIME: 3:00 PM

SUBJECT: FIRE - CHEMICALS - Durham, NC

SUMMARY OF COMMUNICATION

STRICKLAND SAID FIRE WAS AT A DRUM REPROCESSING FACILITY. DRUMS WHICH COULD NOT BE REPROCESSED BECAUSE OF RESIDUAL WAX DISPOSED OUT BACK ALONG WITH PALLETS. PALLETS CAUGHT ON FIRE AS WERE SET.

STRICKLAND INSTRUCTED OWNER TO HAUL IN CLAY AND COAL, GRADE AND SITE PROPERTY BEHIND BEING USED FOR AND CEASE DISPOSING THERE.



CONCLUSIONS, ACTION TAKEN OR REQUIRED

STATE SHOULD GET ENFORCEABLE COMPLIANCE SCHEDULE ESTABLISHED WITH OWNER AND MONITOR PROGRESS.

George H. Scarbrough

INFORMATION COPIES TO: JOHN DO, FIRE, REPROCESSING FIRE, BILL STRICKLAND

NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES
SOUTH CENTRAL REGIONAL OFFICE
225 GREEN STREET
WACHOVIA BUILDING — SUITE 506
FAYETTEVILLE, NORTH CAROLINA 28301



July 10, 1978

Mr. Hugh Pickett
Director of General Services
City of Durham
Post Office Box 2251 *J.P.K.*
Durham, North Carolina 27701

Dear Mr. Pickett:

I would like to thank you, Mr. Bob Mitchell and Mr. Taiton Wood for meeting with me on July 5, 1978. I feel that we are better able to relay one another's ideas when we can have such on-site meetings at Durham's sanitary landfill.

The purpose of this letter is to relay to you some of my concerns for the landfill. Over the past two weeks, your only elevating scraper has been down. Cover material has been hauled by dump truck to the operational area which is very expensive. Earth moving which must be completed during the drier summer months is now two weeks behind. In my opinion the City of Durham needs an additional elevating scraper not only for the volume of earth which needs to be moved, but that two scrapers would provide backup for one another. I know of no other landfill in the state which receives the volume that you do which is dependent upon only one scraper.

Another area of concern is planning the rest of the site for operational use. I understand that money for these plans was appropriated. Please follow through with this as soon as possible so that we all will better know in which direction we are headed.

One other item which I would like to mention concerns operational cost for the sanitary landfill. I understand that for this fiscal year all departments for the City of Durham had to be most frugal in their budget requests. I would like to reintroduce the idea of the County of Durham and City of Durham getting together within one landfill site. Total cost could be reduced but more monies would be available in the operation of one site. Along this same line some sites operating in North Carolina have gone to a

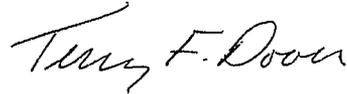
Mr. Hugh Pickett
Page Two
July 10, 1978

"user fee" type plan where solid waste disposal has been treated as a utility. This could be studied for the future.

Again let me say I enjoyed meeting with you earlier. It is always a pleasure to work with officials from the City of Durham in that you have been most cooperative over the years in helping to provide a solid waste program for your people.

If you have any questions or if I may be of assistance to you at any time, please do not hesitate to contact me.

Sincerely



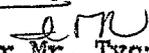
Terry F. Dover
District Sanitarian
Solid Waste & Vector Control Branch

TFD:jbr

cc: Mr. Robert L. Mitchell
Mr. Talton Wood
Mr. O. W. Strickland

July 7, 1978

Mr. Edward A. Tyczkowski
Armageddon Chemical Company
431 Salem Street
Durham, North Carolina 27703


Dear Mr. Tyczkowski:

We have received test results of your latest sample of dried distillation residue (sent on June 19, 1978). Lab results show that this material is still flammable and still contains flammable solvent. It is a definite improvement over the earlier samples as far as the amount of solvent it contained.

However, we do not feel that it would be safe to place this type of material in a sanitary landfill. I am including a list of chemical landfills and incineration services available in the area. Perhaps some one of them could help in this disposal problem.

Very truly yours,

Damon C. Antel
Special Waste Surveyor
Solid Waste & Vector Control Branch
Sanitary Engineering Section

DCA/wss

enclosure

cc: Mr. O. W. Strickland
Mayor Wade L. Gavin

ARMAGEDDON CHEMICAL COMPANY

Sample to lab
on 6/26/78

431 SALEM STREET • DURHAM, NORTH CAROLINA 27703 • PHONE 919 596-5426

M E S S A G E

R E P L Y

TO [O. W. Strickland]
Solid Waste Management
Div. of Health Services, Box 2091
[Raleigh, N.C. 27602]

DATE Answered on 7/3/78
by letter.

DATE 6/19/78

Enclosed is a sample of a dried distillation

residue which does not appear to contain

heavy metals and is no longer highly

flammable. Is this suitable for disposal

in the city landfill?

Thanks for your help.



BY Edward A. Tyczkowski

SIGNED

Form N-R73® The Drawing Board, Inc., Box 505, Dallas, Texas

INSTRUCTIONS TO SENDER:

1. KEEP YELLOW COPY. 2. SEND WHITE AND PINK COPIES WITH CARBON INTACT.

INSTRUCTIONS TO RECEIVER:

1. WRITE REPLY. 2. DETACH STUB, KEEP PINK COPY, RETURN WHITE COPY TO SENDER.



Antel

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

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

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

LABORATORY SECTION
P.O. Box 28047 Raleigh 27611

June 28, 1978



M E M O R A N D U M

TO: Robert J. Drye, Jr., Ph.D., HEAD, ENVIRONMENTAL SCIENCES BRANCH
FROM: W. C. Walker, ENVIRONMENTAL CHEMISTRY LABORATORY *WCW*
SUBJECT: Flammability of Armageddon Chemical Co. Ink Residue

The most recent sample (delivered June 26, 1978) of ink residue from Armageddon Chemical Co. has been tested and found to be flammable.

The test consisted of simply holding a burning match against the surface of a small piece of the residue until the sample burned by itself. It continued to burn until the flame was blown out.

This sample was somewhat more difficult to ignite than the earlier sample from Armageddon.

WCW/jbw

CC: ✓ Damon Antel,
Solid Waste & Vector Control Branch

CC: Paul Childers, Supervisor
Environmental Chemistry Lab

This is sample mentioned in Mrs. Tygzkowski's "message" of 6/19/78. (Letter written in reply on 7/6/78.) material not suited for city landfill disposal.
D.C. Antel

July 3, 1978

Mr. Paul A. Lepene
District Manufacturing Manager
Mead Containers
2002 East Pettigrew Street
Durham, North Carolina 27702

JTC
Dear Paul:

We have just received the results of the analyses made on the waste ink samples which I obtained on my recent visit to your plant. They show a high percentage of solvent and fairly high concentrations of heavy metals. These concentrations are (in milligrams/kilograms): zinc, 154; lead, 701; copper, 293; barium, 3.8; chromium, 108, nickel, 10; iron, 622; manganese, 0.34; and cadmium, 0.04.

I have discussed these results with Mr. O. W. Strickland, Supervisor, Solid Waste Management Unit. We do not think that this waste material should go to any sanitary landfill because of both the solvent and the high level of some of the heavy metals present.

Included in this letter you will find a list of both chemical landfills and two industries which perform an incineration service. Perhaps some of these people can help until you get your new facility and recycling procedures in operation.

Sincerely,

Damon C. Antel
Special Waste Surveyor
Solid Waste & Vector Control Branch
Sanitary Engineering Section

DCA/wss

cc: Mr. O. W. Strickland
Mr. Terry F. Dover
Mayor Wade L. Cavin

enclosure

Write - address should not be handfilled. Give him list of disposal sites

North Carolina Department of Human Resources
 Division of Health Services
 Laboratory Section
 P. O. Box 28047, Raleigh, N.C. 27611



Environmental Sciences Analysis Report

Name of Owner, Patient or Supply: MEAD CONTAINER CO. (SAMPLE #1 - FROM CURRENTLY USED DRUM)

Address: PETTIGREW ST., DURHAM

County: DURHAM

Report to: D. C. ANTEL, O. W. STRICKLAND

Address: SOLID WASTE & VECTOR CONTROL

Date Collected: _____ Date Received: JUNE 1, 1978 Date Analyzed: _____

Analysis Desired: % SOLVENT (INCLUDING WATER); METALS

Laboratory Number	Results In mg/kg									
	% Solvent	Cd	Zn	Pb	Cu	Ba	Cr	Ni	Fe	Mn
06861	94	<0.04	154	701	293	3.8	108	10.0	622	0.34

(over)

SAMPLE PREPARATION

SOLVENTS - 50 gms of sample were weighed into dishes, evaporated on a steam bath and dried to constant weight @ 103°C. % Solvent was calculated from the residue.

METALS - The dry residue from the solvent determination was ignited @ 425°C for 2 hrs. in a muffle furnace. The ignited residue was weighed into flasks, digested with nitric acid, filtered through whatman #1 paper, diluted to 100 mls and analyzed.

North Carolina Department of Human Resources
 Division of Health Services
 Laboratory Section
 P. O. Box 28047, Raleigh, N.C. 27611
 Environmental Sciences Analysis Report



Name of Owner, Patient
 or Supply: MEAD CONTAINER CO. (SAMPLE #2 - FROM DRUM STORED OUTSIDE)

Address: PETTIGREW ST., DURHAM

County: DURHAM

Report to: D. C. ANTEL, O. W. STRICKLAND

Address: SOLID WASTE & VECTOR CONTROL

Date Collected: _____ Date Received: 6/1/78 Date Analyzed: _____

Analysis Desired: % SOLVENT (INCLUDING WATER); METALS

Laboratory Number	Results In mg/kg									
	% Solvent	Cd	Zn	Pb	Cu	Ba	Cr	Ni	Fe	Mn
06862	94	<0.02	57.7	47.8	209	1.6	44.0	0.14	8.5	0.11

PAMARCO Incorporated

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From the Office of:

Douglas E. Tuttle, V.P. Marketing
Roselle, New Jersey 07203
Telephone (201) 241-1200

March, 1978

Fellow Flexographer:

Our topic this month concerns the basic facts every flexographer ought to know about the toxicity of solvents commonly used in and around flexo pressrooms. Many flexographers assume that because most flexo inks are reducible with either alcohol or water, and because both of these solvents normally appear on most restaurant menus, toxicity need not concern the flexo industry. It is true that most solvents used in flexography are less toxic than those commonly used in other printing processes but there are nonetheless a few basic facts that every flexographer should be aware of, regarding the potential toxicity of some of the solvents with which he may come in contact.

For instance, almost all so-called "alcohol-based" flexo inks contain at least 10% of solvents other than alcohol, and almost all "water-based" flexo inks contain similar amounts of solvents other than water. It is also true that even the "ethyl" alcohol used in flexo inks is normally a proprietary, commercially-denatured formula which itself contains about 5% of other solvents as denaturants. These typically include such solvents as ethyl acetate, gasoline and methanol, and most alcohol-based flexo inks contain upward of 10% of solvents such as n-propyl acetate, ethyl acetate, Cellosolve and alcohols other than ethyl. "Water-based" flexo inks usually contain some alcohols, and often some glycols and/or glycol-ethers. "Co-solvent" flexo inks may contain solvent mixtures of approximately equal parts of isopropyl alcohol and an aliphatic hydrocarbon solvent such as "V,M&P" naphtha, which usually contains at least traces of aromatic hydrocarbon solvents, such as toluol.

In addition to the solvents the flexo ink manufacturer uses in formulating the ink as it is received by the printer, the flexo pressman uses solvent mixtures to reduce the ink to running viscosity at the press and to maintain the viscosity and solvent composition of an ink throughout the run by replacing solvent lost by evaporation. Solvents are also used for wash-up purposes and different solvents are used for cleaning plate cylinders and printing plates before and after mounting them on printing cylinders and to activate adhesive backing or mounting materials. Toluol is commonly used for the latter purpose.

The most common route by which solvents enter the body, in flexography, is by inhalation. Other possible methods are by absorption through the skin and by ingestion through the mouth,

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MACHINE ENGRAVED AND ELECTROFORMED EMBOSsing ROLLS, EVENFLO APPLICATOR AND FLEXOGRAPHIC INK TRANSFER ROLLS
GRAVURE ENGRAVED PRINTING ROLLS, RUBBER COVERED ROLLS, ALL TYPES OF STEEL ROLLS AND FLEXOGRAPHIC PLATE CYLINDERS

but common sense should preclude either drinking flexo solvents or washing the skin with them, as serious toxic problems, so we will concern ourselves primarily with toxic risks resulting from breathing solvent vapors.

In evaluating the harmful effects of inhaling solvent vapors, several factors must be considered. These are: 1.) How toxic is the solvent? 2.) How volatile is the solvent? 3.) How long and how frequently will exposure occur?

The chart herewith lists the relative toxicity, in terms of maximum allowable concentration (M.A.C.) for repeated exposure without adverse affects on health, for some typical flexo solvents, and since these allowable concentrations may change from time to time, based on knowledge and experience, we are showing these numbers as adopted by the American Conference of Governmental Industrial Hygienists currently, and as of 20 years ago. They may be still different 20 years hence, so they should be used as guidelines and not as inflexible standards.

Solvents Commonly Used in Flexo Pressrooms

Solvent	Vapor Pressure (mm.Hg@25°C.)	M.A.C. in parts per million	
		1977	1957
Ethyl Alcohol	80	1000	1000
Methyl Alcohol	100	200	200
n-Propyl Alcohol	14.5 (@20°C.)	200	400
Isopropyl Alcohol (99%)	40	400	400
Ethyl Acetate	100	400	400
n-Propyl Acetate	40	200	200
Ethyl Cellosolve	3.8 (@20°C.)	200	200
Methyl Cellosolve	6.2 (@20°C.)	25	25
Benzol (Benzene)	100	1	25
Toluol (Toluene)	30	100	200
V.M.&P. Naptha	22 (@38°C.)	200	500

The volatility of a solvent, (ie: how fast does it evaporate?) is commonly indicated by vapor pressure, in terms of the number of millimeters of mercury the solvent's vapor will support, at a temperature of 25°C. Thus, the higher the vapor pressure of a given solvent, the faster a specific solvent vapor concentration will be reached, under standard conditions. Hence methanol, about 5 times as toxic as ethanol, would reach its maximum allowable concentration in less than 1/5th the time ethanol would require, because methanol has a 25% higher vapor pressure than ethanol. On the other hand, ethyl Cellosolve, with a toxicity rating comparable to that of methanol, but a vapor pressure only about 1/20th that of ethyl alcohol, would, under dead air conditions, take longer than either ethyl or methyl alcohol, to reach toxic concentration levels.

March, 1978

-3-

We have included both benzol and toluol solvents in this table even tho neither of them are flexo ink solvents. Toluol is widely used, in small quantities, to activate "sticky-back" flexo plate mounting materials. Occasionally, we have found benzol used for this purpose, and as the table shows, benzol is 8 times as toxic as toluol, in addition to which benzol's vapor pressure is 3-1/3 times greater than that of toluol. An even more important factor here, in our opinion, is that benzol causes a type of pernicious anemia for which there is no known cure, because it kills the body's red blood corpuscle replacement centers. Therefore, regardless of the numbers alone, in a chart such as this, the advice of a qualified physician or industrial hygienist should be sought and followed.

In any flexo pressroom, adequate ventilation, properly covered ink fountains and ink distribution systems and an awareness of the relative toxicity and volatility of all solvents used will constitute the best insurance against possible toxic effects of solvent vapor inhalation.

Sincerely,

PAMARCO, INCORPORATED



Douglas E. Tuttle
Vice President, Marketing

DET: rgh

Call. in line get analysis samples -

MeadContainers

2002 E. Pettigrew Street
P.O. Box 1851
Durham, North Carolina 27702

Telephone: 919-596-8231

June 6, 1978

Mr. D. C. Antel
N. C. Department of Human Resources
Division of Health Services
Bath Bldgs.
Raleigh, N. C. 27611



Dear Damon,

Enclosed are the test results on the Mead Syracuse, N. Y. plant that I said I would forward to you. This plant is very similar to Mead Durham.

The one major difference is that this is a report on all of the sewage from the plant including such things as:

Personal Waste
Flexo Inks
Lubricants
Corn Starch (glue)
Etc.

I sincerely hope you can read and understand it -- I certainly can't.

Hope this will be of some use to you. If you need anything more from me, please let me know.

Sincerely,
MEAD CONTAINERS
Durham District

Paul A. Lepene
Paul A. Lepene
District Manufacturing Manager

PAL:bv

encls: (6)

cc: A. J. Stiles, Jr.

115-277-517
1976 ONONDAGA COUNTY INDUSTRIAL WASTE MONITORING PROGRAM
C&S DATA

IND	SEWER	TYPE	SIC	ENCO	SAMPLE	DATE	TIME	FLOWRATE	MEAS	HOURS	HOURS	PH	BOD5	COD-M	TOC	TSS	VSS	TKN	TIP
63	1	1	202	4	6225	05/21/76	1505					8.0	1130.0			96.0			
63	1	1	202	4	10368	07/09/76	1500					7.8	1065.0			57.0			
63	1	1	330	4	889	04/26/76	1500					7.8	1325.0			102.0			
64	1	1	202	4	691	04/23/76	1500					7.9	37.5			16.0			
64	1	1	202	4	6005	03/22/76	1505					7.9	88.5			110.0			
64	2	1	202	4	690	04/23/76	1505					7.7	960.0			176.0			
64	2	1	202	4	692	04/07/76	1510					7.6	294.0			71.0			
64	2	1	202	4	6226	05/17/76	1450					7.6	154.3			56.0			
64	2	1	202	4	10369	07/29/76	1500					7.1	18.3			20.0			
84	1	1	205	4	693	04/22/76	1030					6.9	151.5			86.0			
84	1	1	205	4	2171	08/19/76	745					7.2	32.0			52.0			
84	1	1	205	4	6006	03/23/76	800					8.0	159.0			72.0			
84	1	1	205	4	10370	07/02/76	1030					6.7	57.3			40.0			
86	0	1	2086	4	2088	06/02/76	100					6.7	1210.0		700.	220.0			
86	1	1	2086	4	894	04/08/76	920					8.6	1260.0		500.	42.0			1.50
86	1	1	2086	4	2172	08/03/76	1150					6.9	745.0		252.0	144.0			
86	1	1	2086	4	5406	02/06/76	200					8.0	557.5		293.	123.0			2.20
86	1	1	2086	4	5407	02/26/76	45					7.7	256.0		143.	30.0			.20
86	1	1	2086	4	6007	03/19/76	625					7.4	1080.0		463.	80.0			.60
86	1	1	2086	4	10371	07/07/76	100					8.0	1105.0		454.	206.0			
89	1	1	209	4	6227	05/21/76	1500					7.4	1300.0			524.0			
90	1	1	2095	4	2089	06/16/76	1500					7.3	19.1			51.0			
90	1	1	2095	4	2173	08/24/76	300					7.3	34.0			242.0			
93	3	1	203	4	695	04/30/76	1500					7.6	240.0		125.	30.0			
93	3	1	203	4	2094	06/22/76	1500					7.2	116.3		124.	44.0			
93	3	1	203	4	5408	02/25/76	1500					7.9	21.5		13.	47.0			.70
93	3	1	203	4	10372	07/27/76	1505					7.4	12.6		22.	25.0			
99	1	1	26	4	6008	03/12/76	1500					8.3	103.0			76.0			5.80
99	1	1	26	4	6052	03/30/76	1515					7.3	148.5			48.0			5.50
99	1	1	26	4	6228	05/03/76	1500					7.8	173.0			100.0			
100	1	1	26	4	6261	03/22/76	1500					7.9	278.0		158.	42.0			
100	1	1	26	4	10373	07/30/76	1515					7.1	77.0		54.	13.0			
102	1	1	265	4	696	04/27/76	45					8.2	256.5		198.	230.0			
102	1	1	265	4	2123	06/09/76	200					6.9	164.6		170.	228.0			

MEAD CONTAINERS

115-277-517
1976 ONONDAGA COUNTY INDUSTRIAL WASTE MONITORING PROGRAM
C&S DATA

IND	SEWER	SAMPLE	P	CR	CR=HEX	CD	CU	FE	HG	NI	PB	ZN	CN	O&G	PHENOL	AL	CL	C&SNO
63	1	6225	4.2											26.				477.
63	1	10368	6.4											37.				640.
63	1	689	7.0											54.				350.
64	1	691																327.
64	1	6005																224.
64	2	690																328.
64	2	692																276.
64	2	6226																432.
64	2	10369																701.
84	1	693																321.
84	1	2171																773.
84	1	6006																225.
84	1	10370																623.
86	0	2088	.8					12.50										503.
86	1	694						6.86										287.
86	1	2172	1.04					8.9										716.
86	1	5406						9.20										82.
86	1	5407						10.12										134.
86	1	6007						9.70										216.
86	1	10371	.9					7.40										634.
89	1	6227	6.0											7.				476.
90	1	2089																560.
90	1	2173																780.
93	3	695	.3											7.				345.
93	3	2094	2.9											26.				577.
93	3	5408												63.				131.
93	3	10372	.4											19.				691.
99	1	6008										.52						198.
99	1	6052										.40		16.				253.
99	1	6228	2.8									.34						349.
100	1	6261																223.
100	1	10373																703.
102	1	696		.45	.03						72.66			301.				530.
102	1	2123		.78	.39						3.42			45.				

115-277-517

1976 ONONDAGA COUNTY INDUSTRIAL WASTE MONITORING PROGRAM
C&S DATA

HEAD CONTAINERS

IND	SEWER	TYPE	SIC	ENCO	SAMPLE	DATE	TIME	FLOWRATE	MEAS	HOURS	HOURS	PH	BOD5	COO-M	TOC	TSS	VSS	TKN	TIP
102	1	1	265	4	5409	02/23/76	0100					8.9	334.7		171.	191.0			
102	1	1	265	4	10374	07/19/76	2359					6.4	213.6		235.	292.0			
102	1	1	265	4		9/21/76	0100					6.5	163.5		100.0	208.0			
103	1	1	265	4	2124	06/03/76	300					7.7	201.6			218.0			
103	1	1	265	4	5410	02/26/76	145					8.3	103.0			47.0			
103	1	1	265	4	10375	07/16/76	30					6.8	98.0			49.0			
105	1	1	26	4	2125	06/25/76	1500					7.4	58.8			30.0			
105	1	1	26	4	5411	02/24/76	1500					7.7	297.0			21.0			43.00
108	1	1	26	4	2174	08/10/76	1500					6.5	178.3		88.0	47.0			
108	1	1	26	4	6009	03/22/76	1530					1.9	210.0		128.	124.0			
112	1	1	281	4	697	04/13/76	940					10.2	36.6			198.0			
114	1	1	281	4	698	04/20/76	100					7.9	9.5			5.0			
114	1	1	281	4	10376	07/27/76	1230					7.8	10.8			38.0			
115	1	1	283	4	2126	06/15/76	1500					7.5	474.0			272.0			
120	1	1	285	4	6022	03/23/76	1515					7.6	9.1		12.	13.0			.10
120	1	1	285	4	10377	07/21/76	1500					8.2	10.7		30.	38.0			
131	1	1	3079	4	6229	05/21/76	900					8.5	397.0			88.0			
132	2	1	3079	4	2127	06/15/76	830					8.3	254.0			246.0			
132	2	1	3079	4	2175	08/13/76	930					7.3	136.5			170.0			
144	2	1	32	4	6023	03/11/76	1500					11.5	6.7			344.0			
144	2	1	32	4	6230	05/21/76	1525					11.6	18.3			184.0			
151	1	0	32	4	2176	08/27/76	1000					7.1	6.7			100.0			
151	1	0	32	4	6024	03/05/76	1030					9.4	9.0			164.0			
151	1	0	32	4	6231	05/05/76	1400					8.0	7.5			330.0			
152	1	1	332	4	699	04/05/76	1450					8.1	53.7			420.0			
152	1	1	332	4	10378	07/21/76	1510					7.9	16.5			30.0			
160	1	1	3398	4	700	04/06/76	830					7.2	3.1			1.0			

To: MEAD CONTAINERS

Date: 12/12/77

File No.

Attention:

ANALYSIS REPORT

Parameter	Result	Location	No.	Sample Type	Date
pH	10.9	#1		COMPOSITE	1/6/77
BOD ₅	765 mg/l	}	}	GRAB	}
TSS	635				
P	2.1				
O&G	159				
Pb	1.2				
pH	7.6	#1		COMPOSITE	5/19/77
BOD ₅	327 mg/l	}	}	GRAB	}
TSS	144				
P	1.6				
O&G	19.0				
Pb	7.6				
pH	7.1	#1		COMPOSITE	8/5/77
BOD ₅	280 mg/l	}	}	GRAB	}
TSS	195				
P	1.5				
O&G	17.0				
Pb	2.1				
pH	8.2	#1		COMPOSITE	10/28/77
BOD ₅	247 mg/l	}	}	GRAB	}
TSS	94				
P	0.86				
O&G	4.8 5.2				
Pb	4.8				

To: MEAD CONTAINERS

Date: 12/12/77

File No.

Attention:

ANALYSIS REPORT

Parameter	Result	Location	No.	Sample Type	Date
0&G	57 mg/l	#1		GRAB	5/18/77
Pb	24.5 mg/l	#1		GRAB	10/26/77
Cr	5.7 mg/l	#1		GRAB	10/26/77

May 2, 1978

Mr. Edward A. Tyczkowski
President
Armageddon Chemical Company
431 Salem Street
Durham, North Carolina 27703

JTR
Dear Mr. Tyczkowski:

I have discussed the sludges that you brought to my office with Dr. R. J. Drye, Head, Environmental Sciences, Laboratory Section, Division of Health Services.

Sludge #62 residue from reclaiming polyester solvents is not suitable for landfilling. It should be incinerated.

Sludge #2 residue from reclaiming paint solvents is being tested in our laboratories and a decision will be made when the results are known.

Sludge #3 residue for reclaiming plastic solvents is not suitable for landfilling. It should be incinerated.

Sorry I could not be of more assistance.

Sincerely,

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

OWS/wss

cc: Mr. Terry F. Dover
Mr. Stewart Pickett, Jr.



✓
CITY OF DURHAM

NORTH CAROLINA *JJR*

February 3, 1978

DIRECTOR OF GENERAL SERVICES
101 City Hall Plaza



Mr. Terry F. Dover, District Sanitarian
Solid Waste & Vector Control Branch
South Central Regional Office
Wachovia Bank Building
Suite 506 - 225 Green Street
Fayetteville, North Carolina 28301

Dear Terry:

Thank you for your letter of January 30 regarding our need to finalize our landfill plans. We are including in our '78-79 Budget request funds for employing a consulting engineer for the purpose of preparing plans for the best utilization of our landfill properties. This would include the determination on the ultimate height for both phases of the landfill. If this item is included in the budget, those plans should be completed and ready to submit to your office for approval by November, 1978.

The City of Durham's Engineering Staff is in the process of running cross sections of the landfill property in preparation for the study. If this is not acceptable, please let me know.

Yours truly,

H. W. Pickett, Jr.
Director of General Services

HWPJr/ibn

cc: Mr. Robert L. Mitchell
✓ Mr. O. W. Strickland
Mr. Richard Stevens ---

NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

DIVISION OF HEALTH SERVICES
SOUTH CENTRAL REGIONAL OFFICE
225 GREEN STREET
WACHOVIA BUILDING — SUITE 506
FAYETTEVILLE, NORTH CAROLINA 28301



January 30, 1978

Mr. H. W. Pickett, Jr.
Director of General Services
City of Durham
Post Office Box 2251
Durham, North Carolina 27702

Dear Mr. Pickett: ^{EL HC}

As I am sure you are aware, the present elevation of the lower area at the Durham city landfill is some 12 feet below the proposed elevations on your landfill plans. As we have discussed before I think it is time for you to re-appraise your landfill plans. Can we, in fact, reach the proposed final elevations throughout the whole site? I think you are now in a much better position to determine the ratio of cover material to garbage. This issue should be settled as soon as possible as there are doubts in my mind on the workability of your plans.

On my last visit to Durham I was able to review the plans with Bob Mitchell and Talton Wood. It was determined that some of all four phases (sheet 3 of 6 of the plans) has been utilized. I would further suggest you consider expanding your operational plans to cover use for a minimum period of ten additional years.

Let me say at this time that it is always a pleasure to work with the City of Durham. You have, and I am sure will continue with a most successful landfill program. I will be most happy to meet with you at any time to discuss this matter.

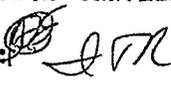
Sincerely,

Terry F. Dover
Terry F. Dover
District Sanitarian
Solid Waste & Vector Control Branch

TFD:jbr
cc: Mr. Robert L. Mitchell
Mr. O. W. Strickland

December 5, 1977

Mr. E. Wade Copeland, Director
General Services Department
414 East Main Street
Durham, North Carolina 27701

Dear Wade: 

Your letter of December 1, 1977, with reference to the Durham County Landfill has been received.

Mr. Terry Dover informs me that much progress has been made at the site.

Your request for a sixty-day extension for completion of the erosion control work is granted.

I would like to thank you for your cooperation in bringing the site into compliance.

Sincerely,

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

OWS/wss

cc: Mr. Terry F. Dover



County of Durham

Durham, North Carolina

December 1, 1977



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

Dear Mr. Strickland:

Mr. Terry Dover has completed his December 1st inspection and his report indicates that "Erosion Controlled" is not complete.

Mr. Dover suggested that I communicate to you, that additional time will be required to complete the major overhaul of the dike slopes which were started about the time I received your letter of November 7th. This work has entailed rebuilding the dikes to conform with standard erosion control slope and will require that several thousand yards of dirt be moved across the landfill top and pushed down the embankment.

This work began on November 1st and has continued as weather permitted using all of our available equipment and one (1) scraper and two (2) dump trucks of a private contractor. About one half of the work was completed during the month of November.

In my opinion, considering the imminent bad weather, the erosion control work should be completed in about sixty (60) days.

Please discuss our problem with Mr. Dover and advise us if this plan is acceptable to your office.

Sincerely,

E. Wade Copeland
Director
General Services Department
414 East Main Street
Durham, North Carolina 27701

June 23, 1977

Mr. Everett W. Southwick
Senior Chemist
Liggett & Myers Tobacco Company, Inc.
West Main & Fuller Streets
Durham, North Carolina 27702

Dear Mr. Southwick:

Your letter of June 13, 1977 with reference to the disposal of waste solvents has been received.

I have discussed the waste composition with Dr. R. J. Drye, Environmental Sciences, Laboratory Section, Department of Human Resources, and it is our opinion that this waste is not suitable for landfilling.

We recommend that the solvent be recovered and incinerated.

Sincerely,

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

OWStg

CC: Mr. Terry F. Dover

Liggett
Group

Liggett & Myers Tobacco Company, Inc.

West Main & Fuller Streets Durham, N.C. 27702



June 13, 1977

Mr. O. W. Strickland
P. O. Box 2091
Raleigh, N. C. 27602

Dear Mr. Strickland:

As I mentioned in our telephone conversation of June 7, the waste material of concern to me is that which accumulates during the routine operation of the Research Center at Liggett & Myers. Typically this amounts to 15-20 gallons each month, depending on the work in progress.

Because of the nature of research it is not possible to state an exact composition of the waste solvents. Typically the solvents most often used are:

hexane
chloroform
methylene chloride
diethyl ether
acetone
methanol

In addition to waste solvents, we have small amounts of waste material that is organic in nature and free of metals. These materials are seldom more than 100 grams per month.

Since the solvents in particular are flammable, it is unreasonable to expect city personnel to handle these materials. Therefore, I would personally carry them to the appropriate location and dispose of them myself taking all prescribed precautions. It is my belief that disposal can be safely handled by pouring the waste out onto the ground and then covering it with dirt. This would permit a slow evaporation of the more volatile components such that flammable concentrations would not occur.

Mr. O. W. Strickland
Page 2
June 13, 1977



My understanding is that you will have to give explicit approval before any materials can be discarded at the Durham city dump. Since we do not have adequate facilities to store large quantities of waste safely, your prompt attention would be appreciated.

Yours very truly,

RESEARCH CENTER

Everett W. Southwick

Everett ~~W.~~ Southwick
Senior Chemist

EWS/jw

cc: Dr. J. D. Mold

June 27, 1977

Mr. Joseph B. Fogg
Golden Belt Manufacturing Co.
807 East Main Street
Post Office Drawer 2332
/ Durham, North Carolina 27702

Dear Mr. ^{JBF}Fogg:

Your letter of June 8, 1977 with reference to sludge disposal has been received.

The information presented is not adequate for a decision to be made with reference to landfilling of the waste.

If you will provide this office with a complete analysis of the waste including the P.H., moisture content and amount generated per day/month/year we will advise as to the waste being suitable for landfilling.

Sincerely,

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

OWS/tg

cc: Mr. Terry F. Dover



GOLDEN BELT MANUFACTURING COMPANY

Executive Offices: 807 East Main Street Post Office Drawer 2332
DURHAM, NORTH CAROLINA 27702
919-682-9394

June 8, 1977



Mr. O. W. Strickland
N.C. Department of Human Resources
Division of Health Services
Solid Waste and Vector Control Branch
Raleigh, N.C. 27602

Dear Sir:

It is urgent that I find a solution for the disposal of our chromium waste. I am submitting three samples, two of which are representative of different stages in the treatment of our bulk waste, along with a description of the contents of each. I would like to be able to dispose of the raw waste, A.

I am requesting permission to dispose of the waste in all three stages and also would like to know where the approved burial locations are.

Sincerely,

Joseph B. Fogg
Joseph B. Fogg

BBW



Sample A

This sample contains the following:

Water.

An alkaline electrocleaner from BASF Wyandotte Corp., and chromium and copper that has been stripped from printing cylinders.

Sample B

This is the same as Sample A plus the following:

Oakite Enprox 702

Oakite Dispoz Aid 1 - This changes hexavalent chromium to trivalent chromium.

Sample C

This is the same as Sample B plus the following:

Oakite Enprox 714

Oakite Dispoz Aid 2 - This precipitates trivalent chromium and other heavy metal that may be present.

The water has been decanted and disposed of.



OAKITE DISPOZ AID 1

CHEMICAL CHARACTERISTICS

chemical composition	inorganic reducing agent
physical form	as received: white powder as used: green solution
odor	pungent
specific gravity	not applicable
bulk density	10 lbs/gal (1200 g/l)
viscosity	not applicable
flash point	none
hygroscopic tendency	pronounced
foaming tendency	none
recommended diluent	spent chromate solutions
maximum solubility	over 20 oz/gal (150 g/l)
behavior in hard water	not applicable
rinsability	not applicable
biodegradable	not applicable (non-surfactant material)
phosphate-free	yes
normal working concentrations	2 lbs/each pound (2 kgs/each kilogram of chromic acid)
normal operating temperatures	room temperature to 120°F (49°C)
pH at working concentrations	4.2 at 1%
effect of working solutions on metals	not applicable

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES

County USA Oklahoma
SCH No. 77-1774
Date March 28, 1977
JR

CLEARINGHOUSE REVIEW AND COMMENT REQUEST

- TO:
- Sanitary Engineering Section
 - Personal Health Section
 - Dental Health Section
 - Epidemiology Section
 - Other _____

- Western Regional Office
- North Central Regional Office
- South Central Regional Office
- Eastern Regional Office

Attn: _____

FROM: Planning Officer

The Department of Human Resources has requested the Division of Health Services to review the "Notification to Clearinghouse of Intent to Apply for Assistance" as noted above, as to its agreement with the goals and objectives of our agency. In compliance with this request, we are referring a copy of this notification to you for:

REVIEW

INFORMATION

Your response must be received no later than April 11, if it is to be included in the Agency response.

REVIEWERS' COMMENTS: No Comment No Objection See attached

Carrie J. Stancu
REVIEWERS' SIGNATURE

IF YOU REQUIRE EITHER ADDITIONAL TIME OR THE COMPLETE PROJECT APPLICATION, CALL THE PLANNING BRANCH, (919) 829-3372, IMMEDIATELY.

REC

FEDERAL ASSISTANCE		2. APPLICANT'S APPLICATION	a. NUMBER	3. STATE APPLICATION IDENTIFIER	a. NUMBER																		
1. TYPE OF ACTION <input type="checkbox"/> PREAPPLICATION <input checked="" type="checkbox"/> APPLICATION <small>(Mark appropriate box)</small> <input type="checkbox"/> NOTIFICATION OF INTENT (Opt) <input type="checkbox"/> REPORT OF FEDERAL ACTION		b. DATE 1976/12/20 <small>Year month day</small>			b. DATE Year month day ASSIGNED 19																		
		<i>Leave Blank</i>																					
4. LEGAL APPLICANT/RECIPIENT				5. FEDERAL EMPLOYER IDENTIFICATION NO.																			
a. Applicant Name : Duke Environmental Center b. Organization Unit : Duke University c. Street/P.O. Box : d. City : Durham e. County : f. State : North Carolina g. ZIP Code : 27706 h. Contact Person (Name & telephone No.) : P.A. Vesilind (919)684-5756				6. PROGRAM (From Federal Catalog) a. NUMBER 1 3 • 5 2 2 b. TITLE General Project Environmental Education																			
7. TITLE AND DESCRIPTION OF APPLICANT'S PROJECT				8. TYPE OF APPLICANT/RECIPIENT																			
The Development of Self-Instructional Packages in THE RECOVERY OF RESOURCES FROM MUNICIPAL SOLID WASTE (Resource Materials Development)				A-State H-Community Action Agency B-Interstate I-Higher Educational Institution C-Substate District J-Indian Tribe D-County E-City K-Other (Specify): F-School District G-Special Purpose District Enter appropriate letter <input checked="" type="checkbox"/> I																			
10. AREA OF PROJECT IMPACT (Names of cities, counties, States, etc.) USA				11. ESTIMATED NUMBER OF PERSONS BENEFITING																			
13. PROPOSED FUNDING				12. TYPE OF APPLICATION																			
<table border="1"> <tr><td>a. FEDERAL</td><td>\$ 55,793</td><td>.00</td></tr> <tr><td>b. APPLICANT</td><td></td><td>.00</td></tr> <tr><td>c. STATE</td><td></td><td>.00</td></tr> <tr><td>d. LOCAL</td><td></td><td>.00</td></tr> <tr><td>e. OTHER</td><td>6,199</td><td>.00</td></tr> <tr><td>f. TOTAL</td><td>\$ 61,992</td><td>.00</td></tr> </table>				a. FEDERAL	\$ 55,793	.00	b. APPLICANT		.00	c. STATE		.00	d. LOCAL		.00	e. OTHER	6,199	.00	f. TOTAL	\$ 61,992	.00	A-New C-Revision E-Augmentation B-Renewal D-Continuation Enter appropriate letter <input checked="" type="checkbox"/> A	
a. FEDERAL	\$ 55,793	.00																					
b. APPLICANT		.00																					
c. STATE		.00																					
d. LOCAL		.00																					
e. OTHER	6,199	.00																					
f. TOTAL	\$ 61,992	.00																					
14. CONGRESSIONAL DISTRICTS OF:				15. TYPE OF CHANGE (For 1to or 1to)																			
<table border="1"> <tr><td>a. APPLICANT</td><td>N.C. #4</td></tr> <tr><td>b. PROJECT</td><td>N.C. #4</td></tr> </table>				a. APPLICANT	N.C. #4	b. PROJECT	N.C. #4	A-Increase Dollars F-Other (Specify): B-Decrease Dollars C-Increase Duration D-Decrease Duration E-Cancellation Enter appropriate letter(s) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>															
a. APPLICANT	N.C. #4																						
b. PROJECT	N.C. #4																						
<table border="1"> <tr><td>16. PROJECT START DATE</td><td>Year month day</td></tr> <tr><td>19</td><td>77/9/1</td></tr> <tr><td>17. PROJECT DURATION</td><td>12 Months</td></tr> <tr><td>18. ESTIMATED DATE TO BE SUBMITTED TO FEDERAL AGENCY</td><td>Year month day</td></tr> <tr><td>19</td><td>78/9/1</td></tr> </table>				16. PROJECT START DATE	Year month day	19	77/9/1	17. PROJECT DURATION	12 Months	18. ESTIMATED DATE TO BE SUBMITTED TO FEDERAL AGENCY	Year month day	19	78/9/1	19. EXISTING FEDERAL IDENTIFICATION NUMBER									
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19	78/9/1																						
20. FEDERAL AGENCY TO RECEIVE REQUEST (Name, City, State, ZIP code) U.S. Office of Education, Application Control Center, Washington, D.C. 20202				21. REMARKS ADDED <input type="checkbox"/> Yes <input type="checkbox"/> No																			
SECTION II - CERTIFICATION		22. THE APPLICANT CERTIFIES THAT																					
		a. To the best of my knowledge and belief, data in this preapplication/application are true and correct, the document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is approved. b. If required by OMB Circular A-95 this application was submitted, pursuant to instructions therein, to appropriate clearinghouses and all responses are attached: <input type="checkbox"/> spouse <input type="checkbox"/> response attached (1) None <input type="checkbox"/> (2) <input type="checkbox"/> (3) <input type="checkbox"/>																					
23. CERTIFYING REPRESENTATIVE		a. TYPED NAME AND TITLE		b. SIGNATURE																			
		Robert Hughes, Director Sponsored Programs																					
				c. DATE SIGNED Year month day 19 77 2 11																			
24. AGENCY NAME				25. APPLICATION RECEIVED Year month day 19																			
26. ORGANIZATIONAL UNIT				27. ADMINISTRATIVE OFFICE																			
29. ADDRESS				28. FEDERAL APPLICATION IDENTIFICATION																			
31. ACTION TAKEN				30. FEDERAL GRANT IDENTIFICATION																			
<input type="checkbox"/> e. AWARDED <input type="checkbox"/> b. REJECTED <input type="checkbox"/> c. RETURNED FOR AMENDMENT <input type="checkbox"/> d. DEFERRED <input type="checkbox"/> e. WITHDRAWN				32. FUNDING <table border="1"> <tr><td>a. FEDERAL</td><td>\$</td><td>.00</td></tr> <tr><td>b. APPLICANT</td><td></td><td>.00</td></tr> <tr><td>c. STATE</td><td></td><td>.00</td></tr> <tr><td>d. LOCAL</td><td></td><td>.00</td></tr> <tr><td>e. OTHER</td><td></td><td>.00</td></tr> <tr><td>f. TOTAL</td><td>\$</td><td>.00</td></tr> </table>		a. FEDERAL	\$.00	b. APPLICANT		.00	c. STATE		.00	d. LOCAL		.00	e. OTHER		.00	f. TOTAL	\$.00
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e. OTHER		.00																					
f. TOTAL	\$.00																					
				33. ACTION DATE Year month day 19																			
				34. STARTING DATE Year month day 19																			
				35. CONTACT FOR ADDITIONAL INFORMATION (Name and telephone number) MAR 29 1977																			
				36. ENDING DATE Year month day 19																			
				37. REMARKS ADDED <input type="checkbox"/> Yes <input type="checkbox"/> No																			
38. FEDERAL AGENCY A-95 ACTION		a. In taking above action, any comments received from clearinghouses were considered. If agency response is due under provisions of Part 1, OMB Circular A-95, it has been or is being made. b. FEDERAL AGENCY A-95 OFFICIAL (Name and telephone no.) SANITARY ENGINEERING SECTION																					

PART II
PROJECT APPROVAL INFORMATION

ITEM 1.

Does this assistance request require State, local, regional, or other priority rating?

Name of Governing Body _____
Priority Rating _____

Yes No

ITEM 2.

Does this assistance request require State, or local advisory, educational or health clearances?

Name of Agency or Board _____

Yes No (Attach Documentation)

ITEM 3.

Does this assistance request require clearinghouse review in accordance with OMB Circular A-95?

(Attach Comments)

Yes No

ITEM 4

Does this assistance request require State, local, regional, or other planning approval?

Name of Approving Agency _____
Date _____

Yes No

ITEM 5

Is the proposed project covered by an approved comprehensive plan?

Check one:

- State
- Local
- Regional

Yes No Location of Plan _____

ITEM 6

Will the assistance requested serve a Federal installation?

Name of Federal Installation EPA, HUD, ERDA
Federal Population benefiting from Project _____

Yes No

ITEM 7

Will the assistance requested be on Federal land or installation?

Name of Federal Installation _____
Location of Federal Land _____
Percent of Project _____

Yes No

ITEM 8

Will the assistance requested have an impact or effect on the environment?

See instructions for additional information to be provided.

Yes No

ITEM 9

Will the assistance requested cause the displacement of individuals, families, businesses, or farms?

Number of:

- Individuals _____
- Families _____
- Businesses _____
- Farms _____

Yes No

ITEM 10

Is there other related assistance on this project previous, pending, or anticipated?

See instructions for additional information to be provided.

Yes No

PART III - BUDGET INFORMATION

SECTION A - BUDGET SUMMARY

GRANT PROGRAM, FUNCTION OR ACTIVITY (a)	FEDERAL CATALOG NO. (b)	ESTIMATED UNOBLIGATED FUNDS		NEW OR REVISED BUDGET		
		FEDERAL (c)	NON-FEDERAL (d)	FEDERAL (e)	NON-FEDERAL (f)	TOTAL (g)
1. Resource Materials Development	13.522	\$	\$	\$ 55,793	\$ 6,199	\$ 61,992
2.						
3.						
4.						
5. TOTALS		\$	\$	\$ 55,793	\$ 6,199	\$ 61,992

SECTION B - BUDGET CATEGORIES

6. OBJECT CLASS CATEGORIES	GRANT PROGRAM, FUNCTION OR ACTIVITY				TOTAL (5)
	(1)	(2)	(3)	(4)	
a. PERSONNEL	\$ 28,200	\$	\$	\$	\$ 28,200
b. FRINGE BENEFITS	3,796				3,796
c. TRAVEL	1,000				1,000
d. EQUIPMENT	2,000				2,000
e. SUPPLIES	1,000				1,000
f. CONTRACTUAL	0				0
g. CONSTRUCTION	0				0
h. OTHER	4,000				4,000
i. TOTAL DIRECT CHARGES	39,996				39,996
j. INDIRECT CHARGES	21,996				21,996
k. TOTALS	\$ 61,992	\$	\$	\$	\$ 61,992
7. PROGRAM INCOME	\$	\$	\$	\$	\$ 0

SECTION C - NON-FEDERAL RESOURCES

(a) GRANT PROGRAM	(b) APPLICANT	(c) STATE	(d) OTHER SOURCES	(e) TOTALS
8. University	\$	\$	\$ 6,199	\$ 6,199
9.				
10.				
11.				
12. TOTALS	\$	\$	\$	\$ 6,199

SECTION D - FORECASTED CASH NEEDS

	TOTAL FOR 1ST YEAR	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
13. FEDERAL	\$ 55,793	\$ 12,500	\$ 12,000	\$ 16,000	\$ 15,293
14. NON-FEDERAL	6,199	1,450	1,375	1,800	1,574
15. TOTALS	\$ 61,992	\$ 13,950	\$ 13,375	\$ 17,800	\$ 16,867

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) GRANT PROGRAM	FUTURE FUNDING PERIODS (years)			
	(b) FIRST	(c) SECOND	(d) THIRD	(e) FOURTH
16. Environmental Education	\$ 55,793	\$	\$	\$
17.				
18.				
19.				
20. TOTALS	\$ 55,793	\$	\$	\$

SECTION F - OTHER BUDGET INFORMATION (attach additional sheets if necessary)

21. DIRECT CHARGES:

22. INDIRECT CHARGES:

23. REMARKS:

PART IV - PROGRAM NARRATIVE (attach per instructions)

DIS:

SUMMARY

Three courses in resource recovery from solid waste have recently been added to the curriculum offered by the Duke University School of Engineering. These courses were designed by an interdisciplinary team of professional engineers, planners and economists and are intended to provide students with a comprehensive education in this increasingly important discipline. Members of this team also have considerable experience in the art of self-instructional education and have authored a number of tape/workbook sets.

Using this background and experience to advantage, it is herein proposed that a series of tape/workbook/slide learning packages in the recovery of resources from municipal solid waste be developed. The need for such skills by urban managers is evident by the importance of the solid waste problem and the very recent development of the resource recovery technology and its attendant required managerial skills. As solid waste disposal options diminish and costs escalate, resource recovery is considered by many municipalities to be the only reasonable alternative. At this time (January 1977) over 500 municipalities have either contracted for or are considering resource recovery.

The self-instructional modules will be designed primarily for non-technically oriented urban managers and will acquaint them with the problems, methods and techniques of judging the feasibility of resource recovery for their municipality.

PART I - DESCRIPTION OF PROPOSAL

The Development of Self-Instructional Packages in THE RECOVERY OF RESOURCES FROM MUNICIPAL SOLID WASTE

Objective

It is proposed that a series of self-instructional packages be designed, constructed and tested in the area of resource recovery.

The objective is to provide a series of modules which can be used by a wide audience in the enhancement of skills and understanding of the technology as well as the administrative and legal ramifications of municipal resource recovery systems.

The Need

The packages will be developed by a task force which has been working on the design of a graduate engineering curriculum option in resource recovery. As part of this project, the members of the task force have traveled to most of the major recovery installations in the United States and have visited with many of the Federal, state and municipal resource recovery professionals. From these travels two significant facts have emerged:

- a) There is tremendous interest in resource recovery at the municipal and state level .
- b) Very few of the officials and professionals feel qualified to evaluate the various technologies, systems and methodologies associated with resource recovery.

The first conclusion is apparent when the present disposal schemes (mostly landfills) are evaluated in terms of future life. It is unusual to find a community which will not in all probability face a crisis in solid waste disposal within the next decade. With nearly \$5 billion spent annually on solid waste disposal, this is clearly a substantive problem for municipalities.

The second conclusion has become apparent by the number of requests our task force has received for advice, materials, and short courses. Several states are in fact prepared to send some of their personnel to our program in order to enroll in portions of the formal courses.

Description of Proposed Project

It is proposed to develop 10 self-contained packages which can be used by urban managers to become more familiar with the programs and problems of resource recovery. The material from these packages could, alternatively, be used for a 5-day short course. This would be designed primarily for non-technical urban managers, as in-service training, but would also be adaptable to university settings in urban management and engineering courses as supplemental "reading".

Specifically, the packages to be designed are the following:

1. Quantities, sources and composition of municipal refuse.

National averages and the problems of using average values, methods of measuring composition and quantities, estimation of materials and energy to be recovered.

2. Collection.

Methods of collection, source separation, purity and value of materials, effectiveness and efficiency, design of routes.

3. Markets for recovered materials.

Evaluation of markets, methods of establishing commitments, materials policies and future supplies.

4. Materials recovery systems.

Siting of plants, flowsheets of unit operations, economics and financing, environmental impact.

5. Energy recovery: Incineration.

Design of water wall and refractory incineration, front vs. back-end systems, economics, operational problems, existing installations.

6. Energy recovery: Pyrolysis.

Alternative pyrolysis systems, including Garrett, Monsanto, Union Carbide and others, economics, examples of installations.

7. Hardware.

Description of unit operations used in refuse processing.

8. Composting.

Use in the United States and lack of success, composting as a unit operation, composting leaves and municipal sludges.

9. European and Japanese practice.

Examples of installations, special problems,
financial and administrative arrangements.

10. Implementation of systems.

Legal problems, administrative alternatives,
financial arrangements, obtaining technical
assistance, writing requests for proposals.

Each module will be self-contained, in that a student may utilize a module independently without needing any of the other nine as prerequisites.

The modules will consist of the following:

- a) workbook
- b) cassette tape
- c) slides or pictures

The workbook/cassette/slides method of instruction has been previously used successfully by the project director for both university and in-service training. The concept of a workbook requiring active participation by the student has been found to be indispensable.

The transcripts from the tapes will also be made available to interested persons. These will be published as a compendium and could be used as a lecture guide in presenting the material as a week-long short course. Community colleges and technical schools will find this especially useful. The Environmental Protection Agency, especially the Office of Solid Waste Management Programs, should find these packages useful as training tools.

The packages will be constructed using the "instruction by objectives" approach (as defined by Mager (1), or promoted by the American Society for Engineering Education (2)). The text by Johnson and Johnson (3) will be used as a guide for attaining the proper approach.

The project director has utilized this approach in the past, in constructing packages for the EPA, classroom use and other agencies. Some of these packages were funded by outside sources.

It is expected that the in-service personnel who complete this instructional package will provide a new skill and understanding in resource recovery. They should be able to evaluate alternative systems of energy and materials recovery, and be able to act as project managers in implementing the programs.

The packages, once complete, will be tested by several practitioners in the local community. They have agreed to participate and evaluate the modules. The experience gleaned from such in-field testing will be used to refine and polish the modules. A pre- and post-test, administered as part of each of the modules will be indicative of our success in information transfer.

An on-site assessment team, composed of a noted educator, Dr. Sherwood Githens of Duke University, and an urban manager, Mr. Robert Morgan of the City of Durham, N.C., will serve on the team. Their skills will be utilized in the preparation and evaluation of the modules. These individuals, along with the five members of the Task Force, will participate in regular meetings for the conception, design and testing of the modules.

Literature and Bibliography

1. Mager, Robert F., Preparing Instructional Objectives, 2nd Edition, Fearon Publishers, 1975.
2. Engineering Education, various articles over the last ten years on personalized instruction.
3. Johnson, Rita B. and Johnson, Stuart R., Assuring Learning with Self-Instructional Packages, or Up the Up Staircase, Self-Instructional Packages, Inc., Chapel Hill, N.C., 1971.

PART II - ORGANIZATION AND BUDGET

Organization of Project

The proposal will be submitted by the Resource Conservation and Recovery Task Force of the Duke Environmental Center. The Center is an interdepartmental organization designed to provide a vehicle for research and education in multi-disciplinary environmental areas. The Task Force is composed of five professors with a common research interest in the recovery of materials and energy from solid waste, and an analysis of materials and energy use. The Task Force has created a curriculum option, consisting of three interrelated courses in resource recovery, including systems management, materials and processes. These courses have already been taught twice, to a total of about 95 students. Members of the Task Force have also participated in consulting projects on solid waste engineering and resource recovery, including a large project designed to establish an action plan for achieving a waste free society. In short, the Duke Environmental Center and the present participants in the resource recovery project will be the principals in the proposed program, with the Director of the Center acting as the project manager.

Needs

Members of the Task Force have also been active in the production of educational materials. Examples of the self-instructional packages

designed by the members of the Task Force include the following:

- Five modules (tape/workbook/slides) on Solid Waste Management for EPA.

- Seven modules (tape/workbook) on Environmental Planning, for EPA.

- Twelve modules (tape/workbook) on Air Pollution Control for Triangle Universities Consortium on Air Pollution.

In addition to these packages, members of the Task Force have written three textbooks, several laboratory manuals, and a variety of other education-oriented material.

The Task Force in short has two attributes:

1. It is a unique concentration of technical, economic and managerial expertise in the area of resource recovery.
2. It has considerable experience in the construction of self-instructional teaching material.

The members of the Task Force are:

P. Aarne Vesilind, Project Director
Associate Professor of Civil Engineering and
Environmental Sciences

George W. Pearsall
Professor of Mechanical Engineering and
Materials Science

Alan E. Rimer
Lecturer in Civil Engineering

Dennis Warner
Adjunct Professor of Civil Engineering

Frank Convery
Associate Professor of Forest Economics

Their resumes are attached.

The two members of the on-site assessment team include:

Sherwood Githens
Professor of Education
Duke University

Robert Morgan
Urban Manager
City of Durham
Durham, N.C.

Budget

	<u>Federal</u>	<u>Non-Federal</u>
Salaries		
Professional, 10 man months @ \$2000	\$20,000	
Fringe Benefits, 16.5%	3,300	
Secretarial, 4 man months @ \$800	3,200	
Fringe Benefits, 15.5%	496	
Graduate Assistants, 1 for nine months	5,000	
Consultants	2,000	
Office Supplies and Materials	1,000	
Travel	1,000	
Equipment and Supplies (tapes, notebooks, playback units, etc.)	2,000	
Publication and Reproduction	2,000	
Overhead (78% of all salaries)	<u>15,797</u>	<u>6,199</u>
TOTAL REQUESTED	\$55,793	\$6,199

BIOGRAPHICAL SKETCH

P. AARNE VESILIND

Associate Professor, Department of
Civil Engineering
Duke University
Durham, N.C. 27706
(919) 684-2434



Director, Duke Environmental Center
Duke University
Durham, N.C. 27706
(919) 684-5756

Born: June 13, 1939 Tallinn, Estonia Citizenship: USA

Marital Status: Married, Gail W. Vesilind, 3 children

Education:

B.S.C.E. Lehigh University, Bethlehem, Pa., 1962
M.S.C.E. Lehigh University, Bethlehem, Pa., 1964
M.S.S.E. University of North Carolina, Chapel Hill, 1965
Ph.D. University of North Carolina, Chapel Hill, 1968

Professional Experience:

A. Teaching and Research

Graduate Assistant, Lehigh University, Department of Civil Engineering, Academic years 1962 to 1964.

Research Associate, University of North Carolina, Chapel Hill, North Carolina, summer 1968.

Research Fellow, Norwegian Institute for Water Research, Oslo, Norway, August 1968 to September 1969.

Associate Professor of Civil Engineering, Duke University, Durham, North Carolina, September 1970 to present.

Visiting Lecturer, Danish Technological University, Lyngby, Denmark, summer 1974.

B. Design and Consulting

Field Engineer, Dravo Corp., Pittsburgh, Pa., summer 1961.

Junior Engineer, California State Department of Water Resources, Sacramento, California, summer 1962.

Sanitary Engineer, U.S. Public Health Service, Philadelphia, Pa., summer 1963.

Design Engineer, Gannett, Fleming, Corrdry and Carpenter, Inc., Harrisburg, Pa., summer 1964.

Research and Development Engineer, Bird Machine Company, South Walpole, Mass., September, 1969 to September 1970.

Senior Associate, Wiggins-Rimer & Associates, Consulting Engineers, Durham, N.C., 1974 to present.

Profession Registration

North Carolina, Professional Engineering Registration No. 5348

Professional Societies

American Society of Civil Engineers
Water Pollution Control Federation
American Water Works Association
Air Pollution Control Association
American Society of Engineering Education
Association of Environmental Engineering Professors

Honors and Awards

Chi Epsilon, Civil Engineering Honorary (Lehigh University)
Delta Omega, Public Health Honorary (University of N.C.)
Sigma Xi, Scientific Research Honorary (University of N.C.)
George C. Bunker Award, Sanitary Engineering (University of N.C.)
Collingwood Prize, American Society of Civil Engineers, 1971
Duke University Outstanding Professor Award, 1971
Fulbright-Hayes Lectureship, University of Waikato, New Zealand, 1976

Community Service

Orange County Sediment and Erosion Control Committee
Member, Durham Symphony Orchestra
Manager, Village Band, Chapel Hill, N.C.
Chapel Hill Recycling Implementation Committee
Coach, Rainbow Soccer League

Academic Service

Member, Academic Council, Duke University, 1974-1976
Member, Engineering Faculty Council, Duke University, 1973-1975
Vice-Chairman, Triangle Universities Consortium on Air Pollution, 1973-present

National Service

Referee, International Association of Water Pollution Research technical publications, 1976 to present
Chairman, Instructional Methodology Committee, Association of Environmental Engineering Professors, 1976
Chairman, conference on "Teaching Solid Waste Engineering", Duke University, 1976

Publications

A. Journal Articles, Pamphlets, and Professional Papers

"History of Environmental Sciences and Engineering", edited from a seminar series, School of Public Health, Department of Environmental Sciences and Engineering Publications, UNC, Chapel Hill, N.C., 1967.

"Attributes of a Thesis Advisor", Journal of Engineering Education, American Society for Engineering Education, Vol. 58, No. 2, 1967.

"Elbow Meter Measures Flow", Public Works, Vol. 98, No. 12, 1967.

Discussion of "Evaluation of Activated Sludge Thickening Theories", by R. I. Dick and B. B. Ewing, Journal, Sanitary Engineering Division, American Society of Civil Engineers, SA1, 1968.

"Design of Thickeners from Batch Settling Tests: Theoretical Consideration", Water and Sewage Works, July, 1968.

"Design of Thickeners from Batch Settling Tests: Practical Consideration", Water and Sewage Works, September, 1968.

"Practical Hydraulics for the Public Works Engineer", with F. E. McJunkin, Public Works, Parts 1, 2 and 3, September, October and November, 1968.

"Use and Misuse of the Sludge Volume Index", Vann, Vol. 4, No. 1, 1969 (Norwegian).

Discussion of "Thickening Characteristics of Activated Sludge", by R. I. Dick, Proceedings, 4th Conference of International Association of Water Pollution Research, Prague, 1969.

"Initial Depth as a Variable in Activated Sludge Settling Tests", with R. I. Dick, Effluent and Water Treatment Journal, May, 1969 (British).

"Quiescent Batch Thickening of Activated Sludge in Small Cylinders", Vatten, Dec. 1969 (Swedish).

"The Sludge Volume Index - What Is It?", with R. I. Dick, Journal, Water Pollution Control Federation, July, 1969.

"Estimation of Sludge Centrifuge Performance", Journal, Sanitary Engineering Division, American Society of Civil Engineers, SA3, June, 1970. (Winner of Collingwood Prize for best paper by younger member, 1971).

"En Vurdering av Slamsentrifugens Ytelse", Vann, Vol. 5, No. 1, 1970 (In Norwegian).

"Polymers Gaining in Sludge Centrifugation", Water and Wastes Engineering, April, 1971.

"State-of-the-Art in Sludge Dewatering", Proceedings, 40th Annual Conference, Georgia Water Pollution Control Association, Augusta, September, 1971.

Discussion of "Shearing Effects on Settling of Activated Sludge", by R. A. Bradley and Ray B. Krone, Journal, Sanitary Engineering Division, American Society of Civil Engineers, SA4, August, 1971.

"Can We Predict Solids in Sludge Centrifugation?", Proceedings, 20th Southern Water Resources and Pollution Control Conference, Chapel Hill, N.C., April, 1971.

"Environmental Engineering Courses for Non-Engineers", with P. Singer and W. McLellon, Proceedings, 8th Annual Workshop, Association of Environmental Engineering Professors, Toronto, Ontario, August, 1972.

"Environmental Forum", a weekly column appearing in 24 newspapers in North Carolina, 1971 to 1974.

"A Laboratory Exercise in Composting", Compost Science, September-October, Vol. 14, Sept.-Oct. 1973.

Discussion of "Economic Aspects of Sludge Dewatering and Disposal", by E. R. Bennett, D. A. Rein, and K. D. Linstedt, Journal, Environmental Engineering Division, American Society for Civil Engineers, 99, EE5, October, 1973.

"Biological Sludge Preservation", with J. A. Nissen, Water and Sewage Works, July, 1974.

"Scale-up of Solid Bowl Centrifuge Performance", Journal, Environmental Engineering Division, American Society for Civil Engineers, Vol. 100, EE2, April, 1974.

"Determining Centrifuge Capacity", Chemical Engineering, April 1, 1974.

"Proceedings of an Educational Conference on Minimum Deposit Legislation", Ed. with E. Sedman, Duke Environmental Center, 1975.

"Classical Approach to Environmental Engineering Education", Proc., Workshop on Linkages in Environmental Engineering Education, Association of Environmental Engineering Professors, Charleston, S.C.

"A Dialogue with Galileo", with R. P. Lalor, Duke Engineer, April, 1975.

"Settling of Metal Hydroxide Slurries", with P. Hayward, Proceedings of the Annual Meeting, American Chemical Society, Chicago, 1975.

"Measuring the Effectiveness of Solid Waste Collection", with J.S. Dajani and G. Hartman, Duke Environmental Center Publication, Duke University, 1976.

"Rural Wastewater Disposal in Orange County, N.C." with W. A. Chantry, Duke Environmental Center Publication, Duke University, 1976.

"Measuring Roadside Litter", Duke Environmental Center Publication, Duke University, 1976.

"Performance Guarantees for Centrifugal Sludge Dewatering", submitted for publication.

"Generating Data for Regional Solid Waste Allocation Models" with J.A. Nissen and F. McAlister, submitted for publication.

Discussion of "Anaerobic Production of Methane from Solid Waste", J. Kumar and N. Kumar Proceedings, Waste Processing and Energy Recovery Conference, ASME, Boston, Mass., 1976.

"Coliphages as Indicators of Viral Water Pollution", with J.B. Hanson, submitted for publication.

B. Textbooks and Learning Packages

"Environmental Pollution and Control", Ann Arbor Science Publishers, Ann Arbor, Michigan, 1975.

"Treatment and Disposal of Wastewater Sludge", Ann Arbor Science Publishers, Ann Arbor, Michigan, August, 1974.

"Solid Waste Engineering", with J. S. Dajani. Six tape/slide/workbook self-instructional modules, for the U.S. Environmental Protection Agency, 1973.

"Environmental Pollution". Seven tape/slide/workbook self-instructional modules, for the U.S. Environmental Protection Agency.

Contributor, various sections, "Environmental Engineers Handbook", B. G. Liptak, Ed. Chilton Book Co., Radnor, Pa., 1974.

"Solid Waste Engineering", Laboratory Manual, Environmental Systems Engineering Publication, Duke University, 1974.

"Ultimate Disposal of Wastewaters and Their Residuals", Ed. with F. E. McJunkin, N.C. Water Resources Research Institute, Raleigh, N.C., 1973.

Contributor, chapters on "Introduction to Solid Waste Engineering" and "Resource Recovery" in Pollution Control Engineering, L. Wang and N. Pereira, Ed. Marcel Dekker, Inc. (in press).

Contributor, chapter on "Pollution", in Social Consequences of Engineering, H. Kardestuncer, Ed. McGraw-Hill Inc. (in preparation).

Contributor, chapter on "Sludge Disposal" in Biological Removal of Phosphorus from Wastewater, G. Levin, Ed. CRC Press (in press).

"Unit Operations in Resource Recovery", with A. E. Rimer and G.W. Pearsall, in preparation.

"Instructional Materials for Teaching Resource Recovery Engineering" Editor, with four participants. Final report of a National Science Foundation project, 1976.

PROFESSIONAL BIOGRAPHY

GEORGE W. PEARSALL

Professor of Mechanical Engineering and Materials Science

Born: July 13, 1933; Brentwood, New York

Education:

B.Met.E. Rensselaer Polytechnic Institute, June 1955
Sc.D. Metallurgy, Massachusetts Institute of Technology,
January 1961

Scholarships and Fellowships:

Rensselaer Polytechnic Institute Prudential Scholarship,
1951 to 1952
New York State Scholarship, 1954 to 1955
American Society for Metals Fellowship, 1957 to 1959

Employment:

Duke University, School of Engineering, Acting Dean, August 1, 1969
to January 31, 1971; Dean, February 1, 1971 to August 31, 1974
Duke University, School of Engineering, Durham, N.C., Associate
Professor, July 1, 1964 to June 30, 1966; Professor July 1, 1966
to present.
Massachusetts Institute of Technology, Cambridge, Mass., Research
Assistant, September 16, 1959 to June 30, 1960; Assistant
Professor, July 1, 1960 to June 30, 1964
Dow Chemical Company, Midland, Michigan, Research Engineer,
July 1955 to August 1957
Rensselaer Polytechnic Institute, Troy, New York, part-time
laboratory assistant, January 1953 to January 1955

Awards and Listings:

Phi Lambda Upsilon
Society of the Sigma Xi
Tau Beta Pi
Associated Students of Duke University Outstanding Professor
Award in 1969
American Men and Women of Science: Physical and Biological Sciences,
12th Edition
Dictionary of International Biography, Volume 9
Engineers of Distinction, 2nd Edition
Who's Who in America, 38th Edition
Who's Who in the South and Southwest, 11th and 12th Editions
Who's Who Among Students in American Universities and Colleges,
1954-55 Edition

Professional Society Affiliations:

American Association for the Advancement of Science
American Institute of Mining, Metallurgical and Petroleum Engineers
American Physical Society
American Society for Mechanical Engineers
American Society for Metals
Durham Engineers' Club (Finance Committee)
Polymer Group of the American Chemical Society
Society of the Sigma Xi (National Committee on Lectureships)
World Society for Ekistics

Selected Publications:

- "Creep Behavior of Magnesium Alloys," with C.S. Roberts, U.S. Office of Technical Services, PB121977 (December 1956).
- "Determination of Orientation in Magnesium by Polarized Light Examination," with S.L. Couling, Trans. AIME 209 (1957), p. 939.
- "Frictional Boundary Conditions in Plastic Compression," with W.A. Bachofen, Trans. ASME, B. Jn'l Eng. Ind. 85 (February 1963), p. 68.
- "Moduledra Crystal Models, a Teaching and Research Aid in Solid State Physics," with A.L. Loeb, Am. Jn'l Physics 31 (March 1963), p. 190.
- "Superconductivity of Two-phase Nb-Nb₂Sn₃ Sintered Compacts," with R.E. Enstrom and J. Wulff, Applied Physics Letters, 3 (September 1, 1963), p. 81.
- "Size and Speed Effects from Lubricant Breakdown in Plastic Compression," with W.A. Backofen, Trans. ASME, B. Jn'l Eng. Ind. 85 (November 1963), p. 329.
- "Current and Field Dependence of Superconductivity on Microstructure in the Niobium-Tin System," with R. Enstrom, T. Courtney, and J. Wulff, Metallurgy of Advanced Electronic Materials, Interscience Publishers (1963), p. 121.
- "Specific Heat Measurement and Proximity Effects in Tin-Lead Eutectic Alloys," with C.A. Shiffman, J.F. Cochran and M. Garber, Reviews of Modern Physics 36 (January 1964), p. 127.
- THE STRUCTURE AND PROPERTIES OF MATERIALS, Volume I, STRUCTURE, with W.G. Moffatt and J. Wulff, John Wiley and Sons, Inc., New York, New York (1964).
- "The Influence of Point Defects on Some Superconducting Properties of Nb₃Sn (Cb₃Sn)," with T.H. Courtney and J. Wulff, Trans. Met. Soc. of AIME 233 (January 1965), p. 212.
- "Effect of Processing History on the Superconducting Properties and Long-Range Order of Ta₃Sn," with T.H. Courtney and

J. Wulff, Jnl Applied Physics 36 (October 1965), p. 3256.

"Thermoplastic Shear and Fracture of Steel During High-Velocity Sliding," with F.P. Gerstle, Jr., P.S. Follansbee, and M.L. Shepard, accepted for publication in WEAR, 1973.

"The Stress Response of an Elastic Surface to a High-Velocity, Unlubricated Punch," with F.P. Gerstle, Jr., Trans. ASME, Journal of Applied Mechanics 41 (1974), p. 1036.

"What a Manager Must Know about Materials, or Materials in Design: Engineering Properties, Economics, and Environmental Impact", ASME Paper No. 75-DE-56, Design Engineering Conference, New York (1975).

"Rotating-Mandrel Extrusion", with H.G. Clark and G. Shepard, accepted for publication, Transactions of the Society for Plastics Engineers.

Publications in Preparation:

INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING, under contract to John Wiley and Sons, New York. "In Vitro Mechanical Properties of Uterine Wall Muscle," with V.L. Roberts.

"An Elastic Potential Solution for a Rigid Block Sliding on an Elastic Half-Space," with F.P. Gerstle.

"A Microstructural Model for the Mechanical Behavior of Semi-crystalline Polymer Fibers," with R.N. Armstrong.

Papers Presented:

"Boundary Conditions at the Roll-Material Interface," Metals Show, Philadelphia, Pennsylvania (October 20, 1960). Invited paper.

"Specific Heats of Tin-Lead Alloys," with C.A. Shiffman, M. Garber, J.F. Cochran and E. Maxwell, Bull. APS 8 (January 23, 1963), p. 66.

"Complex AC Susceptibility of Impure Superconductors," with E. Maxwell and M. Strongin, Bull. APS 8 (January 23, 1963), p. 78.

"Niobium-tin Phase Diagram," with R.E. Enstrom and J. Wulff, AIME Meeting, New York, New York (February 18, 1964).

"Should We Have a Common Introductory Materials Subject for All Engineers and, If So, What Should It Contain?" ASEE Meeting (July 1964). Invited paper.

"The Future World and Education", keynote address to the 14th Annual Convention of the National Association of State Boards of Education, Minneapolis, Minnesota, October 9, 1976.

"The Future World and Education in Florida", keynote address to the Annual Convention of the Florida School Boards Association, Jacksonville, Florida, December 2, 1976.

BIOGRAPHICAL SKETCH

ALAN E. RIMER

Lecturer

Department of Civil Engineering
Duke University
Durham, N.C. 27706
(919) 684-2434

Faculty

Duke Environmental Center
Duke University
Durham, N.C. 27706
(919) 684-5756

Born: August 11, 1942 Pittsburgh, Pennsylvania

Marital Status: Married, Marilyn H. Rimer, 2 children

Education:

B.S.C.E., Duke University, Durham, N.C., 1964
M.S.S.E., University of North Carolina, Chapel Hill, N.C., 1966
Ph.D., Work at University of North Carolina and Duke University
to be completed in 1977

Professional Experience:

A. Teaching and Research

Lecturer, Duke University, Durham, N.C., January 1973 to present

Lecturer, Massachusetts Institute of Technology, Cambridge, Mass.,
Academic years 1968 to 1971.

Graduate Assistant, University of North Carolina, Academic years
1964 to 1966.

B. Design and Consulting

Vice President, Wiggins-Rimer & Associates
Consulting Engineers, Durham, N.C., 1972-present

Project Manager, Camp, Dresser & McKee
Consulting Engineers, Boston, Mass., 1966-1972

Engineer, W.M. Piatt Company
Consulting Engineers, Durham, N.C., summer 1964, 1965

Professional Registration

Engineer:

North Carolina, New York, New Hampshire, Vermont

Surveyor:

North Carolina

Professional Societies

Member, American Society of Civil Engineers
Member, Water Pollution Control Federation
Member, North Carolina Water Pollution Control Association
Member, American Water Works Association
Member, Boston Society of Civil Engineers
Member, Society of Chi Epsilon
Associate Member, Society of Sigma Xi

Honors and Awards

Diplomate - American Academy of Environmental Engineers
Chi Epsilon - Civil Engineering Honorary (Duke University)
George C. Bunker Award, Sanitary Engineering (University of
North Carolina)
Sigma Xi - Scientific Research Honorary (University of
North Carolina)
Tau Beta Pi - Academic Honorary (Duke University)

Technical Publications

Authored - "Microstraining Paper Mill Wastewater" for Journal
Water Pollution Control Federation, July 1971.

Co-authored - "Second Stage Design for Biological Nitrification
Systems" for Session 13 - 44th Annual Conference - WPCF,
October 1971.

Co-authored - "Activated Carbon System for Treatment of Combined
Municipal and Paper Mill Waste Waters in Fitchburg, Mass." for
the Journal of the Technical Association of the Pulp and Paper
Industry, Vol. 54, No. 9, September 1971.

Authored - "Filtration Through a Trimedia Filter" - for the
Journal of the Sanitary Engineering Division - ASCE, June 1968.

Co-authored - "Two Staged Activated Sludge Pilot-Plant Operators
at Fitchburg, Mass." - for the Journal Water Pollution Control
Federation, January 1972.

Co-authored - "Salem-Beverly's Plan for a Secondary Century of
Water Service" - Public Works, April 1971.

Authored - "Paper Mill Wastewater - A Prototype Study of Microstraining"
for the Journal Water Pollution Control Federation, July 1974.

Authored - "Environmental Forum" - contributing editor to a weekly
column published in 24 newspapers in North Carolina.

Authored - "A Look at Detergents" - Duke Engineer, December 1963.

Co-authored - "Legislative Impacts on the Resource Recovery Program
for Hawaii" - Presented at WWEMA Technical Conference, March 1976.

Co-authored - "Characterization and Impact of Stormwater Runoff from
Various Land Cover Types" - Water Pollution Control Federation
Conference, October 1976.

Co-authored - "Experiences in Planning for Areawide Waste Treatment
Management Under Section 208 - A Pilot Project" - Water Pollution
Control Federation Conference, October 1976.

RESUME

Name: Dennis B. Warner
Birth Date: 8 February 1938
Citizenship: USA
Marital Status: Married, three children
Address: 1123 Woodburn Road
Durham, North Carolina 27705
USA
Telephone: Home - (919) 489-1044
Office - (919) 684-2434
(919) 489-6286

Education:

B.A. Liberal Arts and Sciences (history), University of Illinois, 1963
B.Sc. Civil Engineering, University of Illinois, 1963
M.Sc. Civil Engineering (hydraulics, hydrology, soil mechanics), University of Illinois, 1966
Engineer Civil Engineering (engineering-economic planning), Stanford University, 1968
Ph.D. Civil Engineering (engineering-economic planning), Stanford University, 1974

Professional Development Awards:

1966-68 Fellowship to study at Stanford University, Study Fellowships for International Development.
1970-71 Graduate Grant, Stanford University, School of Engineering.
1974 Faculty Fellow, NASA-ASEE Summer Faculty Fellowship Program in Engineering Systems Design, Langley Research Center, Hampton, Virginia.
1975-76 Faculty Fellow, Chautauqua Program on Social Impact Assessment, Duke University

Employment:

1975 - present Research Associate, Duke Environmental Center, Duke University; Durham, North Carolina.
Principal on a curriculum development research project involving the establishment of three new graduate-level courses in the area of resource recovery from solid wastes. Responsibilities include development and teaching of a course on resource recovery systems management and editor of resource recovery newsletter.

1974 - present President, Public Systems Associates, Inc.; Durham, North Carolina.
Direct a consulting firm which provides multidisciplinary planning and evaluation expertise to federal, state, and local governments in the areas of water supply, wastewater disposal, solid waste management, transportation, and urban development. Responsibilities include overall corporate management, preparation of research proposals, contract negotiations, and supervision of water supply and wastewater studies.

1973 - present Assistant Professor, Department of Civil Engineering, Duke University; Durham, North Carolina.
Teach graduate and undergraduate courses in public works planning and evaluation, water resources engineering, resource recovery systems management, and technology in international development. Conduct sponsored research on river basin planning, air transportation applications, and solid waste management.

1971 - 1973

Sanitary Engineer, World Health Organization; Entebbe, Uganda.
 Adviser to the Ministry of Health in Uganda on environmental health aspects of water supply, wastewater treatment, solid wastes disposal, housing, drainage, and training of environmental sanitation personnel. Also Honorary Lecturer in public health engineering in Department of Civil Engineering at Makerere University.

1968 - 1970

Research Fellow, Economic Research Bureau, University of Dar es Salaam; Dar es Salaam, Tanzania.

Conducted field research investigations into the developmental impact of improved rural water supplies for the Government of Tanzania. Secretary and organizer of Workshop on Rural Water Supply, held December 1969 in Dar es Salaam. Chairman, Sub-Committee on Water and Power, National Research Plan, Government of Tanzania.

1967

Administrative Assistant to the Director of the Idaho Water Resources Board, State of Idaho; Boise, Idaho.

Prepared background information on water resource project proposals for the Director of the Idaho Water Resources Board.

1964 - 1966

Engineering Hydrologist (U.S. Peace Corps), Water Development and Irrigation Division, Ministry of Lands, Settlement and Water Development, Government of Tanzania; Dar es Salaam, Tanzania.

Designed and constructed hydrological stream gauging stations. Analyzed hydrologic data: rating curves, unit hydrographs, flood probabilities. Started electronic computer processing of hydrologic data within the ministry. Trained hydrologic field staff. Designed village water supply systems. Part-time mathematics instructor at Dar es Salaam Technical College.

1963 - 1964

Graduate Research Assistant, University of Illinois, Department of Civil Engineering; Urbana, Illinois.

Assisted Profs. Ven Te Chow and others with laboratory experiments of overland flow runoff from variable rainfall intensities on impervious surfaces.

Consulting:

1976 - present

Research Consultant, Institute of Policy Sciences and Public Affairs, Duke University; Durham, North Carolina.

Participating in a research study of the effects of a major capital investment upon minority land ownership and business formation in the Sea Islands near Charleston, South Carolina.

1975 - present

Evaluation Consultant, Asian Development Bank; Manila Philippines.

Participating in a multi-disciplinary ex-post evaluation of the overall impacts of a 1968 capital development loan for the improvement of the Penang (Malaysia) water supply system.

1974 - 1975

Planning Consultant, Agency for International Development, U.S. Department of State; Washington, D.C.

Participated in the preparation of a longitudinal-type socio-economic impact study of four new urban water supply systems in the Philippines.

1974 - 1975

Research Consultant, Conset, Inc.; Washington, D.C.

Directed a study of the community development impacts of improved water and sewer facilities in rural areas of the United States as part of the program of the National Demonstration Water Project.

1970 - 1971

Engineering Consultant, Stanford Research Institute; Menlo Park, California.

Participated in the preparation of an environmental impact analysis of proposed changes in the structure and operation of Bonneville Dam on the Columbia River.

1967 Training Consultant, University of California at San Diego, Division of Extension; San Diego, California.
 Conducted training sessions on water supply design for Peace Corps Volunteers.

Professional Memberships:

American Society of Civil Engineers
 Sigma Xi, Society for the Encouragement of Scientific Research
 International Water Resources Association

Professional Committee Participation:

1975 - present Member, Public Works Committee, Urban Planning and Development Division, American Society of Civil Engineers.
 1970 Chairman, Sub-Committee on Water and Power, National Research Plan, Government of Tanzania.

General Professional Interests:

Public systems analysis, planning, evaluation, and impact assessment, with emphasis in the areas of water resources, urban services, and environmental impacts.

Infrastructure planning and the formulation of technical assistance programs in developing countries.

Water resources engineering, planning, and policy analysis.

Development of innovative planning and evaluation methods for public services which incorporate technological, economic, social, environmental, and policy considerations.

PUBLICATIONS

1. Books

- (1) The Impact of Water and Sewer Development in Rural America: A Study of Community Impacts, with Jarir S. Dajani. Lexington, Massachusetts: D. C. Heath and Company, 1975, 128 pp.

2. Published Articles

- (1) Discussion of "Spatially Varied Flow From Controlled Rainfall", with R. L. Kuhlemeyer. Proceedings, American Society of Civil Engineers, HY4, Paper 3580, July 1963, pp. 233-240.
- (2) "Formulating Guidelines for Rural Water Investment: The Case of Tanzania", East African Journal of Rural Development, Vol. 3, No. 1, 1970, pp. 69-91.
- (3) "A Preliminary Assessment of the Impact of Rural Water Supply Upon Households and Villages", EKistics, Vol. 31, No. 187, June 1971, pp. 452-458.
- (4) "The Challenge to Civil Engineering", Civil Engineering - ASCE, July 1972, pp. 66-67.
- (5) "Evaluation of the Development of Rural Water Supply Projects in East African Villages", Journal, American Water Works Association, June 1975, pp. 318-321.

3. Published Reports

- (1) Evaluation Criteria for Village-Level Water Projects in Developing Countries, Report EEP-30, Stanford University, Project on Engineering-Economic Planning, September 1968, 132 pp.
- (2) Regional Planning in Tanzania: An Economic View from the Field, with P.R. Lawrence, P.R. Raikes, and R.G. Saylor. Economic Research Bureau (Restricted), Paper 68.4, University College, Dar es Salaam, 1968.
- (3) Planning and Evaluation of Rural Water Supply Programs, Economic Research Bureau (Procedural) Paper 68.3, University College, Dar es Salaam, 1968, 9 pp.
- (4) Rural Water Supply and Development: A Comparison of Nine Villages in Tanzania, Economic Research Bureau Paper 69.17, University College, Dar es Salaam, 1969, 16 pp.
- (5) Project Planning for Rural Development: A Case Study of the Manonga Plains Water Supply Schemes, Economic Research Bureau (Restricted) Paper 69.5, University College, Dar es Salaam, 1969, 39 pp.
- (6) editor, Rural Water Supply in East Africa, BRALUP Research Paper 11, University College, Dar es Salaam, May 1970, 189 pp.
- (7) "A Summary of the Tanzania Rural Water Supply Impact Study", in BRALUP Research Paper 11, University College, Dar es Salaam, May 1970, pp. 37-55.
- (8) "Polythene Pipe Chart for Rural Water Supply", in BRALUP Research Paper 11, University College, Dar es Salaam, May 1970, pp. 137-141.
- (9) The Economics of Rural Water Supply in Tanzania, Economic Research Bureau Paper 70.8, University College, Dar es Salaam, 1970, 64 pp.
- (10) Design Criteria for Water Supply Systems in East Africa, BRALUP Research Paper 20, University of Dar es Salaam, October 1973, 40 pp.
- (11) Evaluation of the Development Impact of Rural Water Supply Projects in East African Villages, Report EEP-50, Stanford University, Program on Engineering-Economic Planning, December 1973, 427 pp.

- (12) Urban Transportation: Perspectives on Mobility and Choice, co-author with others. NASA-ASEE and Old Dominion University Research Foundation, Norfolk, Virginia, 1974, 210 pp.
- (13) The Role of the Helicopter in Transportation, with Jarir S. Dajani, David Epstein, and Jeremy O'Brien. Department of Civil Engineering, Duke University, January 1976, 69 pp.

4. Unpublished Papers and Reports

- (1) Field Tests to Reduce Evaporation from Small Bodies of Water, August-September, 1965, prepared for the Ministry of Lands, Settlement and Water Development, Government of Tanzania, Dar es Salaam, Tanzania, February 1965, 14 pp.
- (2) Overland Flow Relationships from Constant and Variable Rainfall Intensities, M.Sc. Thesis, University of Illinois, Department of Civil Engineering, Urbana, 1966, 107 pp.
- (3) "Programmes for Rural Water Supply Development in Tanzania", presented at the annual conference of the Christian Rural Fellowship of East Africa, Moshi, Tanzania, September 1967, 8 pp.
- (4) Contract Services for Water Resource Projects, Idaho Water Resource Board, Boise, November 1967, 6 pp.
- (5) "Research Report: Findings and Recommendations of the Sub-Committee on Water and Power", National Research Plan, prepared for the Government of Tanzania, Dar es Salaam, Tanzania, April 1970, 43 pp.
- (6) Proposal for the Establishment of a Sanitary Engineering Unit Within the Ministry of Health, prepared for the Ministry of Health, Government of Uganda, April 1972, 10 pp.
- (7) Recommendations for a UNICEF-Assisted Demonstration Programme of Piped Water Supply Projects in the Rural Areas of Uganda, prepared for UNICEF, Kampala, Uganda, May 1972, 22 pp.
- (8) "Environmental Health in Uganda: Present Activities, Future Plans, and Critical Needs", prepared as background information for the twenty-second session of the Regional Committee of the World Health Organization held in Conakry, Republic of Guinea, September 1972, 6 pp.
- (9) "Engineering Aspects of Public Health Activities and Needs in Uganda", presented at the annual conference of the Public Health Inspectors' Association (Uganda), December 1972, 10 pp.
- (10) "Environmental Sanitation", presented at the Senior Staff Conference, Ministry of Health, Government of Uganda, Entebbe, Uganda, December 1972, 7 pp.
- (11) The Role of External Aid in the Water Supply Sector of Uganda, prepared for the World Health Organization and the International Bank for Reconstruction and Development, Brazzaville, Republic of the Congo, February 1973, 3 pp.
- (12) Public Health Aspects in the Engineering Curricula of the Faculty of Technology, Makerere University, prepared for the World Health Organization, Brazzaville, Republic of the Congo, March 1973, 8 pp.
- (13) "Evaluation of the Development Impact of Rural Water Supply Projects in Tanzanian Villages: Final Results and Conclusions", presented at the annual conference of the East African Agricultural Economics Society, Dar es Salaam, Tanzania, June 1973, 46 pp.
- (14) Proposals for an Impact Study of the Philippines Provincial Cities Water Supply Project, prepared for the U. S. Agency for International Development, Office of Capital Development, February 1975, 90 pp.

- (15) Recommendations for a Study of Water and Land Use Impacts Upon the Sarah P. Duke Gardens, prepared for Office of the Vice-President, Duke University, October 1975, 9 pp.
- (16) "The Establishment of a Rural Observatory: A Proposal for Federal-State-University Cooperation in Rural Research Studies", with Jarir S. Dajani. Presented at the Eastern Regional Hearings on Rural Water-Sewer Problems, Commission on Rural Water, Columbia, South Carolina, May 1976, 6 pp.

5. Reports in Preparation

- (1) "Solid Waste Systems Planning", with Jarir S. Dajani. Chapter in Environmental Engineering Processes for Pollution Control, New York: Marcel Dekker, Inc. (September 1976).
- (2) An Assessment of the Planning Methodologies Used in the New Hope Dam Project, final report of a research study for the Duke University Research Council, Durham, North Carolina (June 1976).
- (3) Post Evaluation of the Penang Water Supply Project, with John D. Montgomery and Martin Katzman. Final report of an evaluation study for the Asian Development Bank (June 1976).
- (4) Effects of the Kiawah Island Development Upon Minority Land Ownership and Business Formation in the Sea Islands of South Carolina, with Lester M. Salamon. Final report of a research study for the U. S. Department of Commerce (August 1976).
- (5) Curriculum Development in Resource Recovery, with Jarir S. Dajani. Final report of a research study for the National Science Foundation (August 1976).
- (6) Public Systems Planning. with Jarir S. Dajani. Textbook on planning and evaluation methods applicable to public works investments. (est. date 1978).

Teaching Responsibilities:

- 1965 - 1966 Dar es Salaam Technical College (Tanzania)
Pure and Applied Mathematics, "A" Level
- 1972 - 1973 Makerere University (Uganda)
Public Health Engineering
- 1973 - 1976 Duke University
- CE 123: Water Resources Engineering
 - CE 141: Special Projects: Comprehensive Analysis of the New Hope Dam
 - CE 218: Engineering-Economic Analysis
 - CE 219: Engineering-Economic Planning
 - CE 225: Engineering Hydrology
 - CE 249: Resource Recovery Systems Management
 - CE 365: Seminar on the Role of Technology in the Development of the Third World
 - EGR 11: Engineering Graphics

Other University Responsibilities:

Duke University

Service on departmental committees

Thesis advisor to M.Sc. candidates in Civil Engineering

Faculty Advisor, student chapter American Society of Civil Engineers

RESUME

FRANK CONVERY

Home Address:
2315 Wilson St.
Durham, North Carolina 27705
Telephone: (919) 286-1623

Office:
School of Forestry & Environmental Studies
Duke University
Durham, North Carolina 27706
Telephone: (919) 684-2421

PERSONAL INFORMATION

Born: 10 February 1944
Marital Status: Married
Health Status: Excellent
Citizenship: Irish
Visa Type: Permanent U. S. Resident

ACADEMIC QUALIFICATIONS

Ph.D. in Forestry Economics, College of Environmental Science and Forestry, State University of New York at Syracuse, completed in June 1971.

Doctoral studies included work in four areas:

- (1) Forestry Economics, emphasizing problem analysis and decision theory applied at the level of the firm and the forest economy at large.
- (2) Micro and Macro-Economic Theory.
- (3) Quantitative Methods, including statistics, operations research, computer programming and econometrics.
- (4) Development Economics, including economic development of underdeveloped countries, regional science, urban and regional economic analysis, forestry and economic development.

Dissertation

Title: "Rural Land Uses Compared: An Irish Case Study"

M.S. in Forestry Economics, College of Environmental Science and Forestry, State University of New York at Syracuse, completed in June 1969.

Study areas as in the doctoral program, with the emphasis on quantitative methods.

Thesis: "Techniques of Regional Economic Planning."

M.Agr.Sc.(Forestry), Forestry Department, University College Dublin, completed in September 1967.

Academic emphasis on the theory of the firm and industrial organization.

Thesis: "An Economic Analysis of the Wood-Processing Industries in Ireland."

B.Agr.Sc. (Forestry), Forestry Department, University College Dublin, completed in September 1966: First Class Honors.

Content: Fundamentals on the physical, biological and social sciences applied to forestry.

ACADEMIC EMPLOYMENT

September 1971 - June 1976 Assistant Professor of Natural Resource Economics, School of Forestry and Environmental Studies, Duke University

July 1976 - Present Associate Professor of Natural Resource Economics, School of Forestry and Environmental Studies, Duke University

Program Direction: Director of the Environmental Management Program. This is a two year graduate level program, designed to train practicing professional environmental planners and managers. Emphasis is placed on developing and applying the ecological, socio-economic and philosophical skills and outlooks basic to maintaining a high quality human environment. There are approximately 40 individuals enrolled.

Teaching: Teach graduate courses in natural resource economics, advanced forestry economics, environmental economics, organize a resource economics seminar, an environmental policy seminar, and joint teach an undergraduate course in conservation.

Program Development: Have been involved in the development of the Environmental Management degree program, with special emphasis on the application of the social, policy and management sciences to environmental management. Have developed concurrent masters level degree programs between forestry (M.F.) or environmental management (M.E.M.) and the Graduate School of Business Administration (M.F./M.E.M. - M.B.A.) and the Policy Sciences Institute (M.F./M.E.M. - M.A. in Policy Sciences) at Duke. Have also developed a program at Duke for the training of U. S. Forest Service planners, to begin in Spring 1976.

Administrative: Member of the Academic Council (Faculty Governing Body), Duke University. Member of the Traffic Commission, and chairman of a sub-committee developing long range parking-transportation alternatives for the campus. Member of Development Committee, Publications Committee and Financial Awards Committee, School of Forestry and Environmental Studies.

Student Supervision: Have supervised, to completion, 3 Ph.D. candidates in Forestry Economics and 24 Masters candidates in Forestry and Environmental Management. Presently (Fall 1976) directing the work of three Ph.D. and 15 Masters candidates.

Academic Meetings: A session organizer (energy and environmental resources) for the annual meeting of the Eastern Economic Association. Organized a Symposium at Duke on Forestry and Long Range Planning.

September 1967 - September 1971

Graduate Assistant, Department of Forestry Economics, College of Environmental Science & Forestry, State University of New York at Syracuse..

Teaching: Assisted in the teaching of two semesters of macro-economics and one semester of forestry economics. Duties included leading weekly discussion sessions and preparing and grading exams.

Research: Assisted in the New York Appalachian Resource Study.

September 1966 - September 1967

Graduate Assistant, Department of Forestry, University College, Dublin.

Teaching: One year as an instructor in forestry economics, with emphasis on marketing and international trade.

Summer 1963

Eidgenossische Technische Hochschule, Zurich, Switzerland.

Research: Assisted in the preparation of programs of research in silviculture and recreation.

OTHER EMPLOYMENT

Summer 1973

U. S. Forest Service,
Forest Sciences Lab.,
Missoula, Montana

Visiting Scientist:
Research into problems
of forest planning and
land use

Summer 1962

German Forest Service

Logging, silvicultural work

Sept. 1963 -
June 1964

Irish Forest Service

Forest surveying, thinning,
tree pruning studies

Summer 1964

French Forest Service

Logging and silvicultural
work

RESEARCH

The focus throughout has been on applying economics to decisions regarding the use of public forest lands.

Doctoral Research

Compared the economic efficiency, employment, payroll and balance of payments implications of transferring land from agriculture to forestry in a county in Ireland.

Dissertation: "Rural Land Uses Compared: An Irish Case Study", State University of New York College of Environmental Science and Forestry, completed June 1971. 154 p.

Related Publications: "Forestry and Irish Economic and Social Development." Irish Forestry 27(2), 1970, pp. 52-67.

"Rural Land Use and the Balance of Payments", Irish Forestry 30(1), pp.4-15.

"Rural Land Use: A Review" Irish Journal of Agricultural Economics and Rural Sociology 4(1), 1973, pp. 89-99.

"Some Regional Impacts of Alternative Rural Land Uses" Irish Journal of Agricultural Economics and Rural Sociology, 4(2), 1973, pp. 29-49.

Forest Planning - General

The adaptation and application of economic theory to decision-making on federal lands.

- (a) The development of models for tracing the local and regional income, employment and tax implications of alternative use mixes on federal forest lands.

Funded by the Programs and Planning Division, U. S. Forest Service, Atlanta, Ga.

Results: The algorithms developed have been automated by the systems analysis group at the University of Georgia; their application has been made a required component of the forest planning process in the Southern Region, U. S. Forest Service.

Related Publications: "Unit Planning and Local Economic Impacts of Alternative Forest Management Practices." Technical Paper Number One, School of Forestry, Duke University, 27 p.

"Estimating Local Impacts in Land Use Planning" (with Richard C. Field) Journal of Forestry, 74(3), 1976.

Papers Presented: "Unit Planning and Regional Economic Impacts of Alternative Forest Management Practices", presented at the Southern Economics Association Annual Meeting, Washington, D. C., November 1972.

"Studies in Forestry", presented at the Society of American Foresters Workshop on Analysis of Forest-Related Sectors in Regional and Local Economies, Keystone, Colorado, September 1976.

"Aspects of Economics in Decision Analysis" presented at the Southeastern Section Forest Products Association Meeting, Athens, Ga., Fall 1976.

The discussant of "The Fiscal Impact of National Forest Land on Local Government Finances" presented at the Southern Economics Association Meeting, Atlanta, November 1976.

- (b) The application of benefit-cost analysis to federal forest planning.

Funded by the Programs and Planning Division, U. S. Forest Service, Atlanta, Ga.

Results: The procedures developed have been made a mandatory requirement in the regional forest planning process.

Related Publications: Integrating Economic Analysis into the Unit Planning Process, U. S. Forest Service, Atlanta, Ga., 1975, 134 p. Although published, this document is still technically in draft form and is presently being revised for full review and publication.

"Benefit-Cost Analysis and Forest Planning" in Forestry and Long Range Planning (in Press).

Paper Presented: "The Application of Economics in National Forest Planning: Problems and Prospects" presented at the Southern Forest Economics Workshop, Savannah, Ga. May, 1976.

"Forestry and Long Range Planning", Long Range Planning 6(2), June 1973, pp. 27-28.

Review: "Forestry in Great Britain: An Interdepartmental Review", Irish Forestry 30(1), 1973, pp. 48-53.

- (c) Economics applied to river basin planning.

Funded by the Economic Research Service, U. S. Dept. of Agriculture. The application of regression analysis and linear programming to river basin planning. Work thus far has largely involved supervising graduate students and administering the grant.

- (d) Theoretical issues involved in the application of economics in public resource decisionmaking.

Funded by the Policy Analysis Group, U. S. Forest Service, Washington, D. C. Undertaken with Daniel A. Graham, Dept. of Economics, Duke University.

Recreation

The evaluation of outdoor recreation experiences. Funded by the Inter-mountain Forest and Range Experiment Station, U. S. Forest Service.

Related Publications: "The Economics of Outdoor Recreation and the Forest Planner" (with Chandler C. Smith). Proceedings of the National Symposium on the Economics of Outdoor Recreation, U. S. Forest Service, Washington, D. C. (in press).

"Economics Applied to Outdoor Recreation: An Evaluation." Proceedings of the Southern States Recreation Research Applications Workshop, U. S. Forest Service. General Technical Report SE-9, June 1976, pp. 108-119.

Water

Evaluation of the social implications of providing water of varying quantity and quality from forested watersheds. Funded by the Watershed and Minerals Division, U. S. Forest Service, Atlanta, Ga.

Results: Work completed in July 1976.

Related Publication: "The Valuation of Water Flowing from Federal Forest Watersheds in the South: An Inquiry", (with Charles W. Rader). Mimeo, 90 p.

Resource and Environmental Policy

Analysis of desirable characteristics of resource and environmental policy.

Related Publications: "Concepts for Environmental Policy", Administration 22(4), Winter 1974, pp. 351-366.

"Diversity and Irish Forest Policy", Irish Forestry, 30(1) 1973 pp. 16-24.

Review: The Economics of Natural Environments by John V. Krutilla and Anthony C. Fisher, forthcoming in Forest Science.

RESEARCH RELATED ACTIVITY

Long Range Planning Symposium

A three-day symposium concerned with "Forestry and Long Range Planning" was held at Duke in the Spring of 1974. Eight of the papers presented, together with a further five invited papers have been edited (with C. W. Ralston) and are being published as a book titled Forestry and Long Range Planning (in press).

Duke Forest

(a) Initiator and Director of a project undertaken to develop an information system which would allow ready access of information for planning purposes and for the preparation of environmental impact statements. A survey of recreation users was conducted, and past and ongoing research uses were surveyed. A computer mapping (SYMAP) program was adapted for use at the forest level, and information on 19 pertinent biological and physical variables has been stored and can now be accessed on a one acre grid system. Funded by a supplementary appropriation to the Duke Forest Budget by the Chancellor's Office, Duke University.

Results: The computer information system is now fully operational on the Durham and Korstian Divisions of the Forest. The recreation user survey has been completed and written up. The survey of forest related research still requires additional work. It is intended to publish the entire collection as a School Bulletin. Much of this work has been done by graduate students.

(b) Duke Forest Booklet

Initiator and Director of a project to develop a booklet for the interested citizen outlining the history and roles of the Duke Forest, and including forest maps with trails and points of interest indicated. A brief discussion of the dynamics of forest vegetation has also been included.

Funded and published by the Duke Power Corp.

Referee for:

Forest Science
Journal of Leisure Research
Southern Journal of Applied Forestry
Canadian Journal of Forest Research

PAID CONSULTING

- (a) Pre-publication reviewer of books in environmental economics for Prentice-Hall, Inc. and Houghton Mifflin.
- (b) Consultant to the Parks Division, North Carolina Dept. of Natural and Economic Resources, regarding pricing policy for admission to state-owned outdoor recreation facilities.
- (c) Consultant to U. S. Forest Service, visiting National Forests to demonstrate the uses of economics in forest planning.
- (d) Consultant to Research Triangle Institute.

FELLOWSHIPS AND AWARDS

- 1970 Doctoral Dissertation Fellowship in Natural Resources, awarded by Resources for the Future, Washington, D. C.
- 1967-69 Graduate Assistantship, State University of New York
- 1966-67 Graduate Fellowship, University College Dublin
- 1963-66 First place in class each year, with prizes

MEMBERSHIPS IN ORGANIZATIONS

- American Economic Association
- Eastern Economic Association
- Economic and Social Institute
- Society of American Foresters
- Society of Irish Foresters



Durham
JHK

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

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

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

P. O. Box 2091

Raleigh 27602

January 28, 1977

Armageddon Chemical Company
431 Salem Street
Durham, N. C. 27703

Dear Sir:

The management of residual industrial wastes which may be hazardous, potentially hazardous, or hard to handle, such as sludges, semi-solids, liquids, etc., has become a major problem in North Carolina.

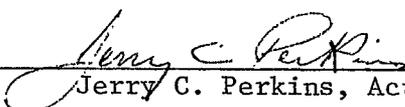
Your assistance is needed to provide the Solid Waste & Vector Control Branch, Division of Health Services, with information on the present status of the management, volume, and composition of these type wastes in North Carolina. This information is needed to develop an orderly and reasonable implementation schedule for Public Law 94-580. The 94th Congress enacted Public Law 94-580 on October 21, 1976. Subtitle C of this Public Law is related to the management of hazardous wastes.

In cooperation with the Environmental Protection Agency, this agency is making a statistical survey of industries in North Carolina to obtain the necessary data for program planning and management of these wastes. A copy of the data collection form is enclosed. It is requested that someone familiar with industrial wastes generated by your facility review the form. The Solid Waste & Vector Control Branch representative that serves your area will contact your company by telephone in the near future to schedule an appointment with your representative so that the data forms may be completed.

If there are questions with reference to this survey, your calls or correspondence should be addressed to:

O. W. Strickland, Program Supervisor
Solid Waste & Vector Control Branch
Division of Health Services
P. O. Box 2091
Raleigh, North Carolina 27602
Telephone: (919)733-2178

Your cooperation is appreciated.


Jerry C. Perkins, Acting Head

Enclosures

cc: Mr. Terry F. Dover



Durham
L & R

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

JAMES B. HUNT, JR.
GOVERNOR

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

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

P. O. Box 2091

Raleigh 27602

January 28, 1977

Durham Paint Company
P. O. Box 987
Durham, N. C. 27702

Dear Sir:

The management of residual industrial wastes which may be hazardous, potentially hazardous, or hard to handle, such as sludges, semi-solids, liquids, etc., has become a major problem in North Carolina.

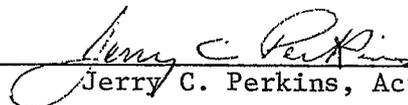
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O. W. Strickland, Program Supervisor
Solid Waste & Vector Control Branch
Division of Health Services
P. O. Box 2091
Raleigh, North Carolina 27602
Telephone: (919) 733-2178

Your cooperation is appreciated.


Jerry C. Perkins, Acting Head

Enclosures

cc: Mr. Terry F. Dover



STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES

JAMES E. HOLSHOUSER, JR.
GOVERNOR

DAVID T. FLAHERTY
SECRETARY

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

Division of Health Services

P. O. Box 2091

Raleigh 27602

February 3, 1976

Mr. Floyd Morgan
Nello Teer Company
Post Office Box 1131
Durham, NC 27702

JAK
Dear Mr. Morgan:

I would like to provide you with the status of the "Rules and Regulations Providing Qualification Standards for Special Tax Treatment of Recycling and Resource Recovery Equipment and Facilities" since you have requested information regarding the effect these regulations might have on your particular facility. Due to the complexities of the statute that established the special tax treatment, there has been a delay in the development of these rules and regulations. I wish to inform you that they are now in draft form and as soon as they are completed and adopted by the Department of Human Resources I plan to provide you with a copy and to have a member of my staff visit your facility to assist you in the development of your request for special consideration.

If in the meantime I can provide you with additional assistance or information in regard to this matter, I shall appreciate hearing from you.

Very truly yours,

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

SHU:bm

TO: USNY

DATE 8-7-75 TIME 12:30 a.m.

While You Were 

Mr. Floyd Morgan
of Nello Tech Co.
P.O. Box 1151 Durham, N.C. 27702

Phone No. 682-6191

Telephoned Will call again

Returned your call Please phone

Came to see you

MESSAGE Requesting information
on tax incentive credit on re-
covery equipment when
established

DHS Form 1162 (Rev. 2-74) Tranda
Taken by

September 11, 1974

Ms. Sonna Loewenthal
Planner II
City of Durham JMR
Department of Administration
Planning Division
Post Office Box 2251
Durham, North Carolina 27702

Dear Ms. Loewenthal:

Your request for information and literature regarding new ideas on solid waste management has been discussed with the members of my staff. New ideas for facilities have been discussed in many trade journals but the establishment of firm and effective facilities or methods of disposal are primarily still in the experimental stage. The sanitary landfill still seems to be a most economical method of disposal since the cost of incineration has increased so rapidly in the past several years that this is rather out of the question for most areas.

I realize that there is much discussion regarding the subject of resource recovery and I agree that all proposals for new ideas in this field should be thoroughly explored to determine its economic feasibility. There are several demonstration areas that are now in operation that are utilizing new ideas for resource recovery either for salvage purposes or for the generation of supplemental heat or power from the materials in the solid waste stream. These experimental units have proven very expensive and all studies have indicated that there is still much research to be done in order to make a complete resource recovery system economically feasible.

There is considerable interest in the recovery of paper from the solid waste stream and at the present time this seems to be the most favorable and economical approach. There are facilities being developed within this State that will be able to adequately handle the recovery of waste paper. It must be recognized that resource recovery facilities will be dependent upon the collection of large volumes of materials in order to make the system economically feasible since the establishment of rather complicated and expensive facilities cannot be done on a small scale basis.

I think the best information that you might obtain in regard to resource recovery systems will be found in the trade journals in the local libraries or the libraries of the university systems. There is at the present time a Legislative Study Commission investigating the problem of resource recovery for North Carolina

Ms. Sonna Loewenthal
Page 2
September 11, 1974

and this Commission will report back to the 1975 General Assembly with its recommendations for the establishment of a program or facility for this purpose. I regret that I am unable to provide you with documentary material but the amount that is being prepared is rather limited. If I can provide you additional information, I shall appreciate hearing from you.

Very truly yours,

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

SHU:bm



CITY OF DURHAM

NORTH CAROLINA

September 4, 1974



Director
Office of Solid Waste and Vector Control
Division of Human Services
Raleigh, North Carolina 27611

CITY OF DURHAM
DEPARTMENT OF ADMINISTRATION
PLANNING DIVISION
P. O. BOX 2251
DURHAM, NORTH CAROLINA
27702

Gentleperson:

In beginning my preparation of a report on community facilities, I am trying to survey the latest trends in many fields of municipal services. In this connection, I would be most appreciative if you could send me what literature you have on new ideas in solid waste management. I am particularly interested in the economics of recycling, in reuses of completed landfills, and in alternatives to sanitary landfills.

Thank you for your assistance.

Sincerely,

Sonna Loewenthal
Planner II

SL:dw



CITY OF DURHAM

NORTH CAROLINA

JHR

September 5, 1974



DEPARTMENT OF SANITATION

Mr. Sidney Usry, Head
Solid Waste And Vector Control Branch
Sanitary Engineering Section
Division Of Health Services
Department Of Human Resources
P. O. Box 2091
Raleigh, North Carolina

Dear Sid:

I thought you might be interested in knowing how we are shaping up on our new landfill.

First, our equipment needs appear to be taken care of. We have just recently gotten back one of the 250's front end loader which had an overhaul, and we are planning on putting a new paint job on it in a few days. Our other 250 front end loader and the Rex Compactor are still in operation each day.

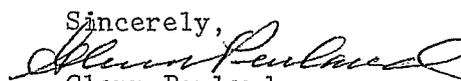
Secondly, we have purchased, and are now operating a new TD 20 Bulldozer. Our old TD 15 Bulldozer is now being overhauled and should be like new within another two to three weeks. We have bought a new eleven yard scraper-pan and it is in Raleigh waiting to have another set of tires put on it.

So, I believe you will agree that from the equipment standpoint, we are in pretty good shape since we now have a Rex Compactor, two 250 front end loaders, one TD 15 Bulldozer, one TD 20 Bulldozer, an eleven yard scraper-pan, and are having a lube service truck equipped now.

The contractor is now working on the road going to the new landfill area. Barring unforeseen problems, the road should be ready by, or maybe sooner, than the October 15 th deadline.

I thought I should apprise you of our progress. I hope that we will not run into any situations that will detain our October 15 th deadline.

I am most appreciative of your time extension on our landfill, and I assure you we will continue to try to meet the deadline.

Sincerely,

Glenn Penland
Supt. San. Dept.

GP/bt

June 25, 1974

Mr. E. Wade Copeland
Durham County Health Department
Durham, N. C. 209

Dear Mr. Copeland:

Your letter of June 10, 1974, in reference to the Durham County
Landfill has been received.

The request for an extension of time until September 30, 1974,
for the site to be in full compliance or closed is granted.

This office will expect the daily operation of the site to be
as near in compliance with the Division of Health Services
Rules and Regulations as possible during this extended period.

Let us congratulate the City and County for considering the
possibility of merging their operations as this is in our
opinion the most feasible approach.

If we can be of assistance, 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. E. S. Swindall
Dr. O. L. Adair
Mr. Tommy Dover

DURHAM COUNTY BOARD OF HEALTH

A. H. London, Jr., M.D. Chairman
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Guy R. Willis, D.D.S.



O. L. ADER, M.D., M.P.H.
DIRECTOR

DURHAM COUNTY HEALTH DEPARTMENT

300 EAST MAIN STREET

DURHAM, N. C. 27701

June 19, 1974



Mr. O. W. Strickland, Supervisor
Solid Waste Management Unit
Solid Waste & Vector Control Branch
Sanitary Engineering Section
N. C. State Department of Human Resources
Post Office Box 2091
Raleigh, North Carolina 27602

Dear Mr. Strickland:

Reference is made to your letter of May 17, 1974 to Mr. E. S. Swindell, Jr., which was referred to me. I am happy to report that progress is being made toward assembling all the data required by your office to approve the Durham County Landfill. The application should be in your hands by June 26, 1974, except for the soil information.

The County has engaged the services of W. M. Pratt Company, Consulting Engineers, to assist in the preparation of data. To date they have drawn plot maps, established grades and elevations, and mapped the new and old areas.

The reasons the soil data will not be available is because we have asked Pittsburg Testing Laboratory not to proceed with drill tests even though a Work Order was issued on June 3rd. There have been some recent developments which could save the County \$475.00 for drilling costs.

A meeting was held on June 12th in the office of Mr. E. S. Swindell, Durham County Manager, with Mr. H. W. Pickett, Director of Public Works and Mr. W. M. Wisnant, Finance Officer, of the City of Durham, Dr. O. L. Ader, County Health Director, and myself being present. We met to discuss the possibility of merging the city and county landfill operations into a single project. The proposal was well received and the discussions were encouraging. Another meeting is planned in the near future with the Durham City-County Committee, composed of members of the council and county commissioners attending.

As a result of this new development we would like to ask your office

Mr. O. W. Strickland

Page 2

June 19, 1974

to extend the June 30th deadline until September 30th. Since a great deal of money is involved and the success or failure of the project depends upon careful planning, we hope that you will look with favor upon this request.

If it appears the merger cannot be negotiated we will notify Pittsburg Testing Laboratory to proceed with obtaining the missing data. The local manager says they can complete their work within one week after being notified.

Efforts are being made to "clean up" the present operation. I hope to see a great deal of improvement within the next two weeks.

Thank you for your consideration, I am,

Sincerely yours,



E. Wade Copeland, Supervisor
Solid Waste Manager, Vector and
Pollution Control Program.

cc: Mr. E. S. Swindell
Dr. O. L. Ader
Mr. Terry Dover

April 18, 1974

Mr. P. F. Collins, Chairman
Laboratory Safety Committee
Liggett & Myers, Inc.
Post Office Box 1572
✓ Durham, North Carolina 27702

JH
Dear Mr. Collins:

Reference is made to your letter of April 2, 1974, regarding the disposal of certain chemicals that would probably be classified as hazardous materials under our solid waste regulations. I have discussed this matter with Dr. R. J. Drye, Head, Environmental Sciences Branch, Laboratory Section, Division of Health Services, and he has agreed that if you will deliver these materials to his office in the Bath Building that he will properly dispose of them.

This in no way is intended to indicate that this agency will continue to handle certain hazardous wastes in this manner but until standards and regulations have been established, it is possible for us to probably handle small quantities in this manner. The Solid Waste and Vector Control Branch is at the present in the process of establishing standards and regulations that will be applicable to the disposal of all hazardous waste and it is hoped that these will be ready for publication in the very near future.

Very truly yours,

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

SHU:bm

cc: Dr. R. J. Drye

LIGGETT & MYERS INCORPORATED

DURHAM, N. C. 27702

April 2, 1974

Dr. J. D. Mold
LIGGETT & MYERS INCORPORATED

POST OFFICE BOX 1572
DURHAM, N. C. 27702



Mr. Sidney Usry, Head
Solid Waste + Vector Control
Division of Health Services
Department of Human Resources
P. O. Box 2091
Raleigh, N. C. 27602

Dear Mr. Usry:

As discussed with you in a recent telephone conversation by our librarian, Mrs. Anne Carmichael, we request your recommendations as to proper procedures for disposal of the following materials:

Benzidine, 30 grams. Solid, slightly soluble in water.

α -Naphthylamine, 100 grams. Solid, slightly soluble in water.

β -Naphthylamine, 300 grams. Solid, slightly soluble in water.

β -Propiolactone, 250 grams. Liquid, b.p. = 162°C, very soluble in water.

Chloromethyl Methyl Ether, 200 grams. Liquid, b.p. = 59°C, decomposes in water.

We will appreciate receiving your recommendations for the disposal of these materials.

Yours very truly,

RESEARCH DEPARTMENT

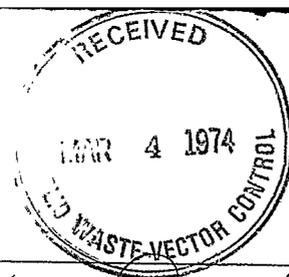
P. F. Collins

P. F. Collins, Chairman
Laboratory Safety Committee

PFC:mdn

cc: Dr. J. D. Mold

Files



SD:

Durham
SD

ANNIE CARMICHAEL IS THE LIBRARIAN AT L & M.
SOME Ph.D. GOT HER TO CALL SO THEY WOULD NOT HAVE
TO REVEAL THE NAMES TO ME, SINCE WE MAKE OSHA
INVESTIGATIONS -

MY GUESS IS THAT THEY HAVE LABORATORY QUANTITIES
OF SOME OF THESE:

- 4- NITROBIPHENYL
- ALPHA-NAPHTHALAMINE
- 4,4'- METHYLENE BIS (2-CHLOROANILINE)
- METHYL CHLOROMETHYL ETHER
- 3,3' DICHLORO BENZIDINE
- BIS- CHLOROMETHYL ETHER
- BETA- NAPHTHALAMINE
- BENZIDINE
- 4- AMINODIPHENYL
- ETHYLENEIMINE
- BPA- PROPIOLACTONE
- 2- ACETYLAMINOFLUORENE
- 4- DIMETHYLAMINO AZOBENZENE
- N- NITROSODIMETHYLAMINE

WHEN/

JOHN L.

DEPARTMENT OF HUMAN RESOURCES

STATE BOARD OF HEALTH

RALEIGH

March 1, 1974

Ms. Anne Carmichael
Information Services
Research Department
Liggett & Myers, Inc.
Box 1572
Durham, North Carolina 27702

Dear Ms. Carmichael:

In answer to your inquiry concerning the disposal of carcinogens. I suggest that you contact Mr. Sidney Usry, Head, Solid Waste & Vector Control Branch, Division of Health Services, Box 2091, Raleigh, North Carolina 27602.

Mr. Usry informs me that he will be able to advise you on land-fill disposal or other suitable procedures if you will tell him the chemicals involved, quantities, and any information on water solubility that you may have.

Sincerely,

John C. Lumsden, Head
Occupational Health Branch

JCL:nhm

CC: Mr. Sid Usry

February 8, 1974

Mr. E. S. Swindell, Jr.
County Manager
County of Durham
Durham, N. C. *JTK*

Dear Mr. Swindell:

After our conference in your office with reference to the Durham County landfill, I returned to my office and reviewed the developments since the landfill was opened in December 1969. The first progress report was made on July 24, 1970, in a letter to Mr. Tucker D. Daniels, Sanitarian, Durham County Health Department, with a copy to you and Dr. O. L. Ader. Since that time reports have been mailed to you on April 20, 1972, December 11, 1972, and September 11, 1973. The site was inspected and inspection reports made on September 5 and October 17, 1973.

In each of the reports it was stated that the site was not being operated as a sanitary landfill but as an open dump.

Representatives of this office have spent considerable time on the site instructing the operator on landfill operating procedures but the recommendations have not been followed.

On my inspection of February 4, 1974, I found the site in deplorable condition. Solid Waste is piled almost the entire length of the access road. Large areas of uncovered waste, as well as an open face, exist almost all around the site. An area of the site was burning.

This office requests your immediate cooperation in bringing the site into full compliance including program plans.

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

Sincerely,

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

OWS/ct

February 8, 1974

Mr. E. S. Swindell, Jr.
County Manager
County of ~~Durham~~
Durham, N. C. *JSK*

Dear Mr. Swindell:

I would like to thank you for going to the landfill site on Monday, Feb. 4, 1974, to observe the condition that existed. Your telephone call concerning the visit was appreciated.

Let me again recommend that the County of Durham and the City of Durham investigate the possibility of operating one sanitary landfill for the total population of your county.

The only county in N. C. that in any way represents the population distribution that you have in Durham County is Pasquotank County. Elizabeth City has about two thirds of the total county population. In this county the City of Elizabeth City operates a landfill for the total county population.

The City of Albemarle operates a sanitary landfill for all of Stanly County.

There are very few counties where the cities are providing disposal services. There are some sixty counties where there is one sanitary landfill operated by the county, providing disposal services for the total population of the county.

I trust this is the type of information you were seeking. If I can be of additional assistance, including meeting with your Board in a combined board meeting, please let me know.

Sincerely,

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

GWS/et

cc: Mr. Julian Foscue III
Dr. O. L. Ador
Mr. Phillip Edwards

April 17, 1973

Mr. Peter A. Bozick
1106 Burch Avenue
Durham, North Carolina 27705

JH
Dear Mr. Bozick:

In reply to your request for plans for Guilford and Durham Counties, I regret that such plans as I discussed with you have not been developed for these two counties. The plans that were developed by this office were primarily for the rural counties that had little or no contract collectors operating within the area.

If I can provide you other information, I shall appreciate hearing from you.

Very truly yours,

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

SHU:bm

DURHAM COUNTY BOARD OF HEALTH

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O. L. ADER, M.D., M.P.H.
DIRECTOR

DURHAM COUNTY HEALTH DEPARTMENT

300 EAST MAIN STREET
DURHAM, N. C. 27701

January 9, 1973

RECEIVED

JAN 11 1973

SANITARY ENGINEERING
DIVISION

Mr. Julian Foscue, III
District Sanitarian
North Carolina State Board of Health,
Regional Office
Asheboro, North Carolina

Dear Mr. Foscue:

This is to inform you of the progress made on the Durham County Landfill plans since we last talked.

Mr. Bob Tinnant, Soil Conservationist for Durham County, has made available, information concerning water tables, topography at 20 feet intervals, aerial photos and information about the soil as it relates to landfill use. He is also advising us as to fertilizer and seeding requirements for the final cover.

Because of very bad weather little progress has been made in the "dressing up" of the fill area itself. An after hours trench has been opened outside the gate to receive waste which would have been dumped on the entrance road when the gate is closed.

A new written contract is now being prepared for the purpose of requesting bids. This contract is expected to contain items which will greatly increase the efficiency of operation and should include the entire operation from the cleaning up of the road to the seeding of the final fill.

Very truly yours,

P. S. Edwards
Sanitarian I
Environmental Health Section

PSE:sa

cc: O. W. Strickland
E. S. Swindell

December 12, 1972

Mr. H. W. Pickett, Jr.
Director of Public Works
City of Durham
Post Office Box 2251
Durham, North Carolina 27702

JR
Dear Mr. Pickett:

Re: City of Durham's Land Disposal Site

The site now used for solid waste disposal by the City of Durham cannot be approved as a sanitary landfill site because the water table is too near the surface and a leaching problem that has been caused by poor planning and operations.

The area that is now being filled can be used for an interim period while a new site is secured.

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

Sincerely,

O. W. Strickland, Program Chief
Solid Waste Management Program
Solid Waste & Vector Control Section
Sanitary Engineering Division

OWS:bm

cc: Mr. I. Harding Hughes, Jr.
Durham County Health Department
Mr. Julian M. Foscoe, III

December 11, 1972

Mr. Frank Barr, R.S.
Durham County Health Department
300 East Main Street
Durham, North Carolina 27701

Dear Mr. Barr:

I am in receipt of an inspection report on the Durham County solid waste disposal area which I am enclosing.

Reviewing past reports, the site has not been operated as a sanitary landfill. This office requests that you give immediate attention to bringing this site into compliance.

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

Sincerely yours,

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

OWS:clf

cc: Mr. Julian M. Foscoe, III

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF Solid Waste Disposal Area

Place visited Durham County Landfill Date November 27 19 72

Address Durham, N. C. Time spent 2 hours
Mr. Phillip Edwards, Sanitarian, Durham County Health Department

By whom Mr. Julian M. Foscoe, III, District Sanitarian, State Board of Health

Persons contacted Mr. E. S. Swindell, Jr., Durham County Manager
(Owner, agent, tenant, manager, other)

Reason for visit Routine

Copies to: Mr. Frank Barr, R. S., Durham County Health Department
Mr. Phillip Edwards, Sanitarian, Durham County Health Department
Mr. E. S. Swindell, Jr., Durham County Manager, Durham, N. C.

REPORT:

On November 27, 1972, Mr. Phillip Edwards, Sanitarian, Durham County Health Department, and I made an inspection of the Durham County landfill. The following deficiencies should be corrected:

1. Litter along the approach road should be collected and placed in the landfill.
2. Dumping of solid waste should be restricted to as small an area as practical.
3. Solid waste should be compacted as densely as practical into cells and covered daily with six inches of compacted earth.
4. Surface water should be diverted from the area of landfill operations.
5. An attendant should be on duty at all times when the site is open for public use.
6. Finished portions of the landfill should be covered with two feet of compacted earth adequately sloped to allow surface water runoff. This area should be seeded soon as conditions are favorable.

After observing conditions at the disposal site, Mr. Edwards and I discussed the operation with Mr. E. S. Swindell, Durham County Manager. Our conversation with Mr. Swindell revealed the following:

1. Mr. Frank O. Gunter, Landfill Operator, is responsible for proper operation of the landfill under the supervision of the Durham County Health Department, Mr. Phillip Edwards, Sanitarian. Problems in securing correction of operational deficiencies are to be reported to the County Manager by Mr. Edwards.
2. Mr. Edwards is to secure required plans and have the completed portion of the landfill seeded soon as conditions are favorable.
3. Mr. Swindell indicated he would give consideration to the entrance road litter problem.

JMF:bm

Durham
MD

December 19, 1972

Mr. V. Lee Bounds, Commissioner
Social Rehabilitation and Control
State of North Carolina
601 West Morgan Street
Raleigh, North Carolina

Dear Mr. Bounds:

Please be advised that on October 31, 1972, an inspection of your Durham Subsidiary No. 4015 Landfill was made by the writer and Mr. James H. Sloan from the Solid Waste and Vector Control Section, Sanitary Engineering Division, N.C. State Board of Health, accompanied by Mr. R. W. Tingen of your office, and some members of the Highway Division, Durham District.

This site is being operated as an open dump and found in a deplorable condition, which is in violation of the N.C. State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal," a copy for your information is enclosed.

It is requested that this site be brought into full compliance by February 1, 1973, or closed in accordance with Section XIII-C, paragraphs 1, 2, 3, and 4.

If this office can be of any further assistance, please advise.

Sincerely,

C. W. Strickland, Program Chief
Solid Waste Management Program
Solid Waste & Vector Control Section
Sanitary Engineering Division

JLS:elf

cc: Mr. Ralph D. Edwards
Mr. George S. Willoughby, Jr.
Mr. George A. Brinkley
Mr. Robert A. Smith
Mr. E. J. Kevonian
Mr. R. W. Tingen



CITY OF DURHAM

NORTH CAROLINA

November 15, 1972 *lrc*

DIRECTOR OF PUBLIC WORKS

P. O. Box 2251
Durham, N.C. 27702

Mr. Sidney Usrey, Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division'
N.C. State Board of Health
Post Office Box 2091
Raleigh, North Carolina 27602

Dear Mr. Usrey:

On a recent visit to the Sanitation Division Office in Greensboro, I came across a booklet entitled "Sanitary Landfill: Design & Operation". It is my understanding that this booklet is issued through your office. I would appreciate it very much if you would forward three copies of that publication to the Public Works Department in Durham. We feel that it could prove to be helpful to us in our landfill operations.

Yours truly,

H. W. Pickett, Jr.
Director of Public Works

Sent 11-17-72

HWPJr/DOP/ibn

RECEIVED

NOV 17 1972

SANITARY ENGINEERING
DIVISION

Durham
LRR

November 13, 1972

Mrs. L. J. Borstelmann
2506 Francis Street
Durham, North Carolina 27707

Dear Mrs. Borstelmann:

In reply to your letter of November 9, 1972, I regret that I do not have the information you requested regarding cost for shipment of junked automobiles and rubber tires. I suggest that you contact United Salvage Corporation, Kernersville, North Carolina, since they are in this business and can probably provide you with the information.

Very truly yours,

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

SHU:bm

BORSTELMANN
2506 FRANCIS STREET
DURHAM, N. C. 27707

9 Nov 72

Dear Sir:

Do you have any information on the transportation costs of junk automobiles and rubber tires?

I assume scrap dealers throughout the state ship by rail for recycling. To what destination? At how much cost? How much is moved?

I will be obliged for informa-

tion.
RECEIVED

Sincerely,

Mrs. L. J. Borstelmann

NOV 10 1972

LABORATORY ENGINEERING
DIVISION

November 9, 1972

Mrs. David Herr
3112 Camelot Court
Durham, North Carolina 27705

DM
Dear Mrs. Herr:

I am enclosing a copy of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal" as requested in our telephone conversation yesterday. These rules and regulations have been in effect since March, 1971, and as you read through them, you can see that there are specific dates regarding compliance. We are having great success in the program that has been planned for the State as many counties are developing the solid waste management programs that will serve the entire county.

The State Board of Health established a plan in 1968 that would ultimately lead to an effective solid waste management plan for North Carolina. It was decided that the use of a sanitary landfill would provide the easiest and most economical system. It is anticipated that as other types of disposal become available that the emphasis will probably be shifted into some of these facilities that will increase the possibility of recycling of those materials that are economically feasible for reclamation. The solid waste management program that has been developed will eventually eliminate the use of the open dump and the equipment that is purchased to establish this program can be used with the development of other programs.

If I can provide you additional information regarding this program, I shall appreciate hearing from you.

Very truly yours,

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

SHU:bm
Enclosure



CITY OF DURHAM
NORTH CAROLINA

November 1, 1972

DIRECTOR OF PUBLIC WORKS

RECEIVED

NOV 7 1972

SANITARY ENGINEERING
DIVISION

Mr. Jerry C. Perkins, Deputy Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division
State Board of Health
Post Office Box 2091
Raleigh, North Carolina 27602

Dear Mr. Perkins:

The City Manager, Mr. I. Harding Hughes, Jr., has forwarded your letter of October 13, regarding plans for operation of the City of Durham's disposal site.

In accordance with my telephone conversation with you this afternoon, we are in the process of working on the plan and we appreciate Mr. Strickland agreeing to come over tomorrow to clarify several points which we have regarding the preparation of the plan.

We appreciate the courtesies which have been extended to us by the Sanitary Engineering Division.

We are making every effort to provide the plan at an early date.

Yours truly,

H. W. Pickett, Jr.
Director of Public Works

HWPJr/ibn

cc: Mr. I. Harding Hughes, Jr.
Mr. Sidney Usrey
Mr. Glenn Penland

Dw
CCH

October 20, 1972

RECEIVED

OCT 21 1972

Ms. Louise MacComb
1611 Duke University Road
Paula Apartments # 12B
Durham, North Carolina 27701

SANITARY ENGINEERING
DIVISION

Dear Ms. MacComb:

Enclosed you will find several publications with regard to solid waste management.

Our office does not have the type of information you are requesting. Our role with the states is more of a source of information on new methods of improving solid waste management as developed by our research and demonstration grants. We also provide grants to states for planning solid waste programs as well as to local and regional agencies.

The State of North Carolina has the Authority for setting standards on solid waste management for which the city of Durham must comply.

I suggest that you contact Mr. Usry for information concerning the city of Durham's solid waste disposal system.

Mr. Sidney H. Usry
Chief
Solid Waste and Vector Control Section
Division of Sanitary Engineering
North Carolina State Board of Health
P. O. Box 2091
Raleigh, North Carolina 27602

A copy of your letter and our response will be forwarded to Mr. Usry.

If we can be of further assistance, please do not hesitate to contact us.

Sincerely,
Ronald L. Ellis
Ronald L. Ellis
Staff Engineer
Technical Assistance Section

cc: Mr. Sidney Usry

October 2, 1972

Dear Sirs:

I understand that your agency is designated as the single agency for the states for purposes of implementing the Federal Solid Waste Disposal Act.

I need to obtain some information governing the effectiveness of the solid waste disposal in the City of Durham as to refuse disposal. Does Durham comply with the health and safety laws set up by your agency? What about NEPA guidelines? What do you consider the biggest problem in waste disposal in Durham? Would this problem be solvable with a greater allotment of money for such a purpose? What is being done about the problem now?

I am doing a project for a civil engineering course at Duke University and would appreciate any assistance which you could offer. Your Research Triangle office in North Carolina had no specific information on refuse disposal. They suggested that I write to you.

Sincerely,

Louise MacComb

My address is: Ms. Louise MacComb
1511 Duke University Road
Paula Apartments # 12B
Durham, North Carolina 27701

Durham
doc

October 13, 1972

Mr. I. Harding Hughes, Jr.
City Manager
Durham, North Carolina 27523

Dear Mr. Hughes:

A review of the records concerning solid waste disposal facilities show that the City of Durham has not submitted plans in accordance with Section IX of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal."

It is requested that this office be advised of the status of proposed plans for the current site now in use and/or proposed plans for a new disposal site.

If this office can be of assistance in the development of plans for compliance, do not hesitate to call.

Yours truly,

Jerry C. Perkins, Deputy Chief
Solid Waste & Vector Control Section
Sanitary Engineering Division

JCP:cif

cc: Mr. Julian M. Foscoe, III
Mr. Frank H. Barr, R.S.

August 10, 1972

Mr. B. B. Olive
Patent Attorney
Post Office Box 1755
Durham, North Carolina 27702

SHU
Dear Mr. Olive:

I am attaching a copy of the map that you requested that indicates the extent of county solid waste management programs in North Carolina. The counties shown in yellow indicate that these counties are in the process of implementation of county-wide plans that will provide adequate facilities for solid waste disposal in that county. While some have actually become operational, many of these have either purchased land or provided appropriations that will be adequate to establish an effective program.

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

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF Solid Waste Disposal Site

Place visited ✓ Durham County Landfill Date April 20 19 72

Address Durham, N. C. Time spent 2 Hours

By whom Tucker Daniel, Sanitarian, Durham County Health Department; and Julian M. Foscue, III, District Sanitarian, N. C. State Board of Health

Persons contacted Mr. Tucker Daniel, Sanitarian, Durham County Health Department
(Owner, agent, tenant, manager, other)

Reason for visit Routine

Copies to: Dr. O. L. Ader, Health Director, Durham County Health Department
Mr. Tucker Daniel, R.S., Durham County Health Department

REPORT:

On April 20, 1972, Mr. Tucker Daniel and I made an inspection of the Durham County landfill. While inspecting the site, Mr. Daniel explained to me that the operation has greatly improved since its beginning.

The following recommendations should be implemented to further improve the operation of the Durham County landfill:

1. Solid waste should be confined to a small area, thoroughly compacted on a load-by-load basis, and covered after each day's operation with six inches of compacted earth. (Proper compaction will insure more efficient use of available land.)
2. Proper grade should be maintained as the face of the landfill is advanced.
3. The completed portion of the landfill should be covered with two feet of compacted earth and seeded as some erosion was observed.
4. A considerable amount of solid waste was observed along the approach road to the disposal site. This waste should be removed and placed in the landfill.

JMF:bm

February 10, 1972

Mrs. M. L. Dillon
1005 Lincolnton Avenue
Durham, North Carolina 27701

JR
Dear Mrs. Dillon:

Your call to Pollution Help Line has been referred to this office for reply as solid waste disposal is a responsibility of this agency.

I am sending a copy of this letter to Mr. O. W. Strickland, Supervisor, Solid Waste Management, with the request that he investigate the problem of trash and debris being deposited in the creek along Duke and Grayson Street.

I hope that we can be of some assistance in alleviating this problem.

Very truly yours,

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

SHU:bm

cc: Mr. O. W. Strickland
Mrs. Jackie Wall

POLLUTION HELP LINE REPORT

DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES

DATE: 2-7- 19 72

TIME: _____ AM
PM

NAME OF CALLER: Mrs. M. L. Dillon

ADDRESS: 1005 Minerrow Ave.
Street P. O. Box

Durham, N.C. 27701
City Zip

TELEPHONE NUMBER: 682-4119

RECEIVED

SANITARY ENGINEERING
DIVISION

POINT OF POLLUTION: _____

SOURCE OF POLLUTION: _____

1. NATURE OF CALL: Durham Hight School emitting black smoke from smoke stacks.

Mr. Stewart
2. A creek running between Duke & Oregon St., starting at 500 block of Oregon and running past the YMCA, is polluted from trash and debris which causes an offensive odor.

3. What restrictions have been placed on Duke Power Company regarding fumes from buses?

REPORT REFERRED TO: (1) Air Quality Div., (2) Sanitary Engineering Div., State Board of Health

IMMEDIATE ACTION TAKEN: _____

SIGNED Jessie Stall

B. B. OLIVE
PATENT ATTORNEY
SUITE 514 TRUST BUILDING
POST OFFICE BOX 2049
DURHAM, NORTH CAROLINA 27702

PATENT, TRADEMARK, COPYRIGHT PRACTICE

TELEPHONE (919) 682-4025
688-8734

JHR
November 15, 1971

Mr. Sidney H. Usry
Chief, Solid Waste & Vector Control Section
Sanitary Engineering Division
North Carolina State Board of Health
P. O. Box 2091
Raleigh, North Carolina 27602

RECEIVED

NOV 16 1971

SANITARY ENGINEERING
DIVISION

Dear Mr. Usry:

I appreciated very much your letter of November 11th,
and I hope we can exchange information in the future on the
solid waste problem.

Yours very truly,

B. B. Olive
(anm)

B. B. Olive

BBO:anm

November 11, 1971

Mr. B. B. Olive
Patent Attorney
Suite 514 Trust Building
Post Office Box 2049
Durham, North Carolina 27702

JPK
Dear Mr. Olive:

In reply to your letter of November 5, 1971, it is the responsibility of this agency to acquire and record data concerning future solid waste volumes. We are at the present time planning to make additional studies to update the data that we now have regarding the amount of solid waste and types that are being generated that will require methods of disposal.

In our opinion, it will be necessary that new methods for recycling of those materials that can be used will be a necessity in order to adequately handle the ever-increasing volume of waste. We are cognizant of several new processes that are now in the pilot stage and intend to make in-depth studies to determine the feasibility of these processes for use in North Carolina. Our planning will very definitely include the installation of applicable processes that we may have the benefits of recycling along with proper disposal of waste so as to improve our environment.

It is the responsibility of this agency to prepare long range planning so as to adequately handle the solid waste problem. The plans that are being developed at the present time are intended for only a short period of time as we realize that new and innovative ideas will be necessary within a very short period of time. We feel very strongly that appropriate facilities will be absolutely necessary for the reclamation of many of the disposal items that are now generated throughout the State.

I appreciate your interest in this problem and I shall be glad to keep you informed of the development of new systems and new programs. 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

B. B. OLIVE
PATENT ATTORNEY
SUITE 514 TRUST BUILDING
POST OFFICE BOX 2049
DURHAM, NORTH CAROLINA 27702

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TELEPHONE (919) 682-4025
688-8734

November 5, 1971

North Carolina State Board of Health
Solid Waste & Vector Control Section
Sanitary Engineering Division
P. O. Box 2091
Raleigh, North Carolina 27602

Attention: Mr. Sidney H. Usry

Dear Mr. Usry:

I appreciate your letter and the interesting and helpful information.

What really concerns me is what we are doing on a State level concerning estimating future solid wastes volume, type, weight, etc., and how we are going to handle it. We are pretty well convinced here that between 7 years, as a minimum, and 20 years, as a maximum, the conventional land fill idea simply will not work for Durham County.

Is there a long range planning group operating on the State level? Is anyone at the State level keeping absolutely up-to-date on a state, national and international basis concerning new methods and new machines for handling solid waste? This is what I would really like to know.

Sincerely yours,


B. B. Olive

BBO:anm

RECEIVED

NOV 8 1971

SANITARY ENGINEERING
DIVISION

Durham
JHR

November 4, 1971

Mr. B. B. Olive
Patent Attorney
Post Office Box 2049
Durham, North Carolina 27702

Dear Mr. Olive:

Your letter to Mr. Roy G. Sowers, Jr. has been referred to this office for reply.

The 1969 General Assembly enacted legislation that established the North Carolina State Board of Health as the agency responsible for the disposal of solid waste. In accordance with the authority granted in this legislation, the North Carolina State Board of Health adopted "Rules and Regulations Providing Standards for Solid Waste Disposal" (copy attached).

The Solid Waste and Vector Control Section of the Sanitary Engineering Division has for many years provided technical assistance to municipal and county governments in the planning and establishing of solid waste collection and disposal programs. Within the past year, this agency has provided assistance to 82 counties in preparing actual plans of operation that will provide adequate collection and disposal facilities on a county-wide basis. This program will be continued until such time as the entire state will have adequate plans to handle the ever increasing problem of solid waste.

This agency is also in the process of preparing a State Solid Waste Disposal Plan in accordance with the requirements of the Office of Solid Waste Management to qualify for grants that might be available from Federal sources to provide assistance to communities. Unfortunately, Federal assistance has been rather limited except in the matter of funding new and innovative ideas or demonstration projects.

The personnel of this section have provided assistance to both the City and County of Durham upon request and has been limited primarily to the operation of disposal sites. If requested, a complete county program will be prepared and recommended that would provide for the collection and disposal of solid waste.

Mr. B. B. Olive
Page 2
November 4, 1971

I appreciate your interest in this problem and assure you that we will be glad to provide you assistance in any way possible.

Very truly yours,

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

SHU:bm
Enclosure
cc: Mr. Roy G. Sowers, Jr.



State of North Carolina
Department of
Natural and Economic Resources

Raleigh 27611

ROBERT W. SCOTT
GOVERNOR

ROY G. SOWERS, JR.
SECRETARY
TELEPHONE
AREA CODE 919-829-4177

October 29, 1971

RECEIVED

NOV 1 1971

Mr. B. B. Olive
Patent Attorney
Post Office Box 2049
Durham, North Carolina 27702

SANITARY ENGINEERING
DIVISION

Dear Mr. Olive:

Thank you for your letter. I am taking the liberty of sharing it with Mr. Sidney Usry, Chief of the Solid Waste and Vector Control Section in the State Board of Health and asking him by copy of this letter to bring you up to date on the solid waste disposal problem in North Carolina.

The State Board of Health, under present State law, has jurisdiction in this area. I agree with you that it is one of the serious problems in North Carolina.

My best wishes.

Cordially,

Roy Sowers
Roy G. Sowers, Jr.

RGSjr:ng

cc: Mr. Sidney Usry ✓

Mr. Usry:

I would appreciate getting copies of the information that you send to Mr. Olive.

Roy G. Sowers, Jr.

*1 cp
Arms*

B. B. OLIVE
PATENT ATTORNEY
SUITE 514 TRUST BUILDING
POST OFFICE BOX 2049
DURHAM, NORTH CAROLINA 27702

PATENT, TRADEMARK, COPYRIGHT PRACTICE

TELEPHONE (919) 682-4025
688-8734

October 19, 1971

Mr. Roy L. Sowers
North Carolina Department
of Conservation and Development
Raleigh, North Carolina

Dear Mr. Sowers:

I will catch up with your new title and office in due course.

My purpose in writing is to inquire as to whether or not you have knowledge of any department, or other group, in State government looking at the solid waste disposal problem from a State viewpoint.

We have a small group in our local Chamber of Commerce looking into the problem only as it affects the City and County of Durham. Our very preliminary findings are startling and the deeper we study the problem the more we realize that this is a State problem. Therefore, I would be much interested to know what is going on or what is planned at the State level.

Yours very truly,

Bill Olive
B. B. Olive

BBO:arm



CITY OF DURHAM
NORTH CAROLINA *ETK*

August 19, 1971

DIRECTOR OF PUBLIC WORKS

RECEIVED

AUG 20 1971

N. C. State Board of Health
Sanitary Engineering Division
Raleigh, North Carolina

SANITARY ENGINEERING
DIVISION

Gentlemen:

Sent 8-23-71

Please send us two copies of your green booklet entitled
"Rules and Regulations providing Standards for Solid
Waste Disposal". Thank you very much.

Yours truly,

Edison H. Johnson

Edison H. Johnson
Director of Public Works

EHJ/ibn

July 14, 1971

Dr. O. L. Ador
Health Director
Durham County Health Department
300 East Main Street
Durham, North Carolina 27701

SLH
Dear Dr. Ador:

I am attaching a report prepared by Mr. O. W. Strickland regarding the solid waste disposal site in Durham County, Durham, North Carolina.

If we 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

bm

Attachments

cc: Mr. Ed Swindoll, Jr.
Durham County Manager

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF Solid Waste Disposal Site

Place visited Durham County Date June 18 1971

Address Durham, N. C. Time spent 3 hours

By whom O.W. Strickland, Program Coordinator, Solid Waste & Vector Control Section, N.C.
State Board of Health

Persons contacted Mr. Tucker Daniel, Sanitarian, Durham County Health Department
(Owner, agent, tenant, manager, other)

Reason for visit Routine

Copies to: Dr. O. L. Ader, Health Director, Durham County Health Department
Mr. Ed Swindell, Jr., Durham County Manager

REPORT:

The overall operation of the disposal site has improved. The following improvements should be made to bring the operation up to standard.

1. Solid waste should be placed in as small an area as possible, compacted, and covered each day.
2. The cover material at the foot of the face should be removed and used for final cover. This will provide an area for more waste.
3. Blowing paper should be controlled.
4. Surface water should be diverted from the working area.
5. The lower area at each end of the dike should be used during the dry season.
6. The operational plan presented to the county on December 2, 1969, should be followed.
7. Contact the United Auto Disposal Company, Drawer G, Kernersville, North Carolina 27284, concerning auto disposal.

DURHAM COUNTY BOARD OF HEALTH

A. H. London, Jr., M.D. Chairman
Ralph P. Rogers, Jr. Vice-Chairman
Charles H. Chawning, Sr. R. Wensell Grabarek
W. H. Murdock Dewey S. Scarboro
Guy R. Willis, D.D.S.



Duckham
O. L. ADER, M.D., M.P.H.
DIRECTOR

DURHAM COUNTY HEALTH DEPARTMENT

300 EAST MAIN STREET

DURHAM, N. C. 27701

October 12, 1970

RECEIVED

OCT 13 1970

SANITARY ENGINEERING
DIVISION

Mr. Frank Gunter
101 May Road
Durham, North Carolina 27703

Dear Mr. Gunter:

Reference is made to the Durham County Sanitary Landfill. The operation is much improved since the last progress report. As mentioned before, one of the disadvantages of a landfill is that it can easily become an open dump if not operated properly. Mr. John Davis, disposal site attendant, has shown a cooperative attitude and has done a good job to bring the site into conforming standards.

There are some items which warrant consideration and attention:

1. The wet weather trench should be prepared for use as inclement weather is inevitable in the coming months. Perhaps you could arrange posts and a chain to prevent dumping in the trench when the main ramp area is accessible.
2. Signs should be posted at the entrance gate giving hours of operation and legal holidays. Obviously, this would prevent a misunderstanding as to when the site is open or closed.

I am confident that you will continue to perform a satisfactory service - even an outstanding service.

As always, if there is further help or clarification which you need, please feel free to call my office.

Sincerely,

Tucker D. Daniel

Tucker D. Daniel, R. S.

TDD:pc

cc: Mr. E. S. Swindell, Jr.
Mr. O. W. Strickland ✓
Dr. O. L. Ader

August 5, 1970

Mrs. Jeannette G. Lucas
Durham ECOS
Box 4782
Duke Station
Durham, North Carolina

JHR
Dear Mrs. Lucas:

Your letter to Elmer G. Cleveland has been referred to this office for reply.

While this office realizes that the recycling of certain wastes is both practical and feasible, I regret that at the present time that such a program has not been fully developed within North Carolina. In other areas of the nation, some corporations have erected pilot plants to receive some of the products that you list for the purpose of reprocessing and recycling. This is specifically true in the aluminum cans and non-returnable glass bottles. At the present time these facilities are not available for this area.

From a study that is being conducted by a member of my staff, there is an interest by the scrape paper dealers in establishing an economical and feasible means for the reclamation of paper. However, this program will require considerable reorganizing and planning that will involve not only the paper dealers but the other producers of waste paper. Following this study, I may be able to provide you with more positive information as to sources that will be available for the reclamation of paper.

The problem of junk automobiles is of national concern. Studies are being made as to the most feasible means of removing these items from the streets and neighborhoods. The removal of junked automobiles will require additional legislation in order to provide a legal means for the removal of these items as the titles and ownership must be established and cleared. The economics involved also has created somewhat of a deterrent in the handling of these items. I am sure you are familiar with the new facility that is now being conducted at Kearnerville for the express purpose of disposing of junked automobiles. I understand that the capacity of this plant will be large enough that much of the area will receive the benefits from this operation.

I appreciate your interest in this matter and if I can provide you with additional assistance or information, I shall appreciate hearing from you.

Very truly yours,

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



PUBLIC HEALTH SERVICE

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGIONAL OFFICE

Environmental Health Service
Environmental Control Administration
Room 404 - 50 Seventh Street, N.E.
Atlanta, Georgia 30323

July 20, 1970

Mrs. Jeannette C. Lucas
Durham ECOS
Box 4782
Duke Station
Durham, North Carolina

RECEIVED

JUL 26 1970

ENGINEERING
DIVISION

Dear Mrs. Lucas:

Due to a recent reorganization of the Department of Health, Education, and Welfare Regional offices, North Carolina was transferred into Region IV which has its headquarters in Atlanta, Georgia. Although this transfer became effective on July 1, 1970, I have yet to become cognizant of the full realm of solid waste activities in your State.

Therefore, I am forwarding your letter to Mr. Sidney Usry, Program Director, Solid Waste Program, North Carolina State Board of Health, 225 North McDowell, Raleigh, North Carolina 27602, for appropriate action. I feel sure Mr. Usry will be able to provide you with the information you desire.

I am enclosing information which you may find helpful. If I may be of further assistance, please contact me.

Sincerely yours,

Elmer G. Cleveland
Solid Waste Management Representative
Region IV

Enclosures

cc: Mr. Sidney Usry

① STOLL
Durham ECOS
Box 4782
Duke Station
Durham, North Carolina

Regional Assistant Administrators
Environmental Health Service Regional Office
Region III
220-7th Street, NE
Charlottesville, Virginia 22901

Dear Sirs:

As co-ordinator of the American Friends Service Committee grant for a summer ecology project in Durham, I am writing for any assistance you might provide in our efforts to broaden the general concern for local environmental conditions and their improvement. We are working with the local OEO groups of ACT and UOCI and their neighborhood groups to encourage neighborhood action and individual participation. Through the Bureau of Solid Waste Management, we hope that you can provide us with information or resource sources possible recycling channels in the North Carolina area for such solid wastes as non-returnable glass, paper products, and most important junked automobiles. We need specific methods for recycling in this particular area; names of recycling plants nearby, etc. With your help, we hope to launch more than just clean-up campaigns; we want recycling channels for the material accumulated and a solution for our most pressing problem of dumped automobiles. Any assistance you can provide will be greatly appreciated.

Sincerely,

Jeannette C. Lucas

Jeannette C. Lucas
Durham ECOS Board of Directors

RECEIVED

JUL 6 1970

E.C.A.

DURHAM COUNTY BOARD OF HEALTH

A. H. London, Jr., M.D. Chairman
Ralph P. Rogers, Jr. Vice-Chairman
Charles H. Chewning, Sr. R. Wensell Grabarek
W. H. Murdock Dewey S. Scarborough
Guy R. Willis, D.D.S.



O. L. ADER, M.D., M.P.H.
DIRECTOR

DURHAM COUNTY HEALTH DEPARTMENT

300 EAST MAIN STREET
DURHAM, N. C. 27701

July 28, 1970

RECEIVED

JUL 29 1970

SANITARY ENGINEERING
DIVISION

Mr. E. S. Swindell, Jr.
County Manager
Durham County Office Building
Durham, North Carolina 27701

Dear Mr. Swindell:

Reference is made to the progress report submitted to us by Mr. O. W. Strickland, R.S., State Board of Health. Unfortunately the report is accurate. The Solid Waste & Vector Control Section has given us an excellent set of guide lines for the operation of our landfill. These regulations have been discussed at length with Mr. Gunter by Mr. Strickland and myself. However, we have apparently failed to communicate with our operator.

For the month of June and for the month of July, I have not given Mr. Gunter a statement of approval for the operation of our disposal site. The statement was not given because the operation was unsatisfactory. Hopefully this situation can be rectified in the near future.

If I can be of further assistance, please do not hesitate to call my office.

Respectfully,

Tucker D. Daniel, R.S.
Sanitarian II

TDD:lf

cc: Mr. O. W. Strickland
Mr. Ben Shaw
Mr. Frank Gunter

July 24, 1970

Mr. Tucker D. Daniel, R. S.
Sanitarian II
Durham County Health Department
300 East Main Street
Durham, North Carolina 27701
JAR

Dear Mr. Daniel:

This is a progress report made on the Durham County land disposal site, operated by Mr. Frank Gunter. The site is not being operated according to recommendations made by the Solid Waste & Vector Control Section of the North Carolina State Board of Health. These recommendations were made by letter dated December 2, 1969. Since these recommendations were made they have been explained on the site to Mr. Gunter and Mr. Daniel. Adequate equipment and an excellent site are available, but the present operation is little more than a dump. I see no reason why this site should not be operated as a model sanitary landfill.

If we can be of any help in getting this operation back on the plan, please feel free to call on us.

Sincerely,

O. W. Strickland, R. S.
Program Coordinator
Solid Waste & Vector Control Section
Sanitary Engineering Division

OWS:bm

cc: Dr. O. L. Ader
Mr. Ed Swindell, Jr.

5-18-70

Mr. Harty,

This is the first we have heard from
-this area in many moons. Mr Lindstrom
moved from D. several months ago.

Mr. Belemann is over here now. We would
like for you to give some thought
to the request to give me a call later.

Would a visit by you or someone else
or both from the State H Dept be in order?
Incidentally, the builder had all the
dirt removed from the front wall & it lay
open for weeks

O. L. Adler

Durham
LSR

4104 Deepwood Circle
Durham, N.C. 27707
15 May 1970

Mr. Daryl Bateman
County Planning Director
County Office Building
Durham, N.C.

RECEIVED

MAY 19 1970

SANITARY ENGINEERING
DIVISION

Dear Mr. Bateman:

You have already seen the evidence that the garbage dump on the lot adjacent to my property is in an active state of decomposition. The presence of a house in this dump creates a condition conducive to anaerobic decomposition creating quantities of methane gas. This gas can get into the confines of the house, and the presence of an open flame (water heater or furnace pilot, cigarette, etc.) can cause a fatal explosion. That this can happen is a scientific fact, and the proof exists that such a possibility is present at this house. More simply, the house is a death trap.

Biochemical Oxygen Demand tests just made on contaminated water surfacing at the foundation wall confirm my alarm. This condition endangers the lives of my family as well as those of a family who might unknowingly purchase the house.

I therefore request that Durham County condemn the property between mine and that of Mr. and Mrs. C.A. Lindstrom as unsafe for human occupancy. It is your moral responsibility to prevent the possibility of another landfill tragedy.

The house has salvage value. Human lives do not.

I ask for your immediate action on this request. Thank you.

Discussed with Dr. Ader
via tel. on May 27, 1970

Sincerely,

SLK

Sidney L. Kauffman, Jr.

cc: O.L. Ader
E.S. Swindell
N.C. Dept. of Ins.
A. Colaruso

NORTH CAROLINA
STATE BOARD OF HEALTH
RALEIGH

December 2, 1969.

Mr. Ed Swindell, Jr.
Durham County Manager
Durham, North Carolina

Dear Mr. Swindell:

Please find enclosed the report and recommendations in regard to the proposed sanitary landfill site near Redwood.

If members of our staff can be of further assistance, do not hesitate to call on us. Your selected site has the potentiality of being a model sanitary landfill for the State of North Carolina, if operated properly.

Sincerely,

Jerry C. Perkins, Sanitary Engineer
Insect and Rodent Control Section
Sanitary Engineering Division

JP/mg

cc: Mr. Ben Shaw
Mr. Tucker Daniel
Mr. O. W. Strickland

STATE BOARD OF HEALTH
SANITARY ENGINEERING DIVISION
RALEIGH, NORTH CAROLINA

REPORT OF INVESTIGATION OR INSPECTION OF Proposed Sanitary Landfill

Place visited Durham County, North Carolina Date November 10 & 25, 1969
Address Durham County Time spent 1 day
By whom O. W. Strickland, District Sanitarian; Jerry C. Perkins, Sanitary Engineer
Persons contacted See Report
(Owner, agent, tenant, manager, other)
Reason for visit To provide plans and recommendations for the proposed Durham County sanitary landfill.

Copies to:

Mr. Ed Swindell, Jr.
Mr. Ben Shaw
Mr. Tucker Daniel
Mr. O. W. Strickland

REPORT:

The following persons were contacted by Mr. Strickland and Mr. Perkins during the assemblage of information required for the site planning for the proposed sanitary landfill near Redwood: Mr. Ed Swindell, Jr., Durham County Manager; Mr. Ben Shaw, Assistant to the Durham County Manager; Mr. Tucker Daniel, Sanitarian, Durham County Health Department; and Mr. Frank Gunter, a contractor who has the solid waste disposal contract with Durham County. The initial contact was made on 10 November 1969 and a subsequent contact was made on 25 November 1969 at which time Mr. Perkins discussed the planning operations aspect further with Mr. Shaw and Mr. Tucker.

The tract investigated lies northeast of the City of Durham and is approximately 76 acres and is located just off the Redwood Road. Boundaries for the property are identified on the J. Watts Copley, Land Surveyor Drawing, Register Number L-415.

A southern portion of the tract is traversed by the Seaboard Air Line Railway and is not included in the discussion for development for landfill purposes because of accessibility problems and that upon completion of the Falls of the Neuse Project this portion of the tract will lie in the floodplain and would definitely not be recommended for landfill operations.

A cemetery located on the property has sufficient elevation not to cause any

problems as long as its natural drainage towards the major drainageway is not blocked and the area in its immediate vicinity is not disturbed. The cemetery area will not be affected by the initial operations as it is located on a ridge opposite to the planned one.

The tract is traversed by two drainageways which are an asset to the sanitary landfill development. A gas line cuts the property on the western side. The overall tract is sloped and has a white clayey soil. The terrain lends itself to the area-ramp method of disposal by sanitary landfill.

Present information available indicated that a population of 36,136 with an equivalent population of 10,000 in industrial and Research Triangle waste is to be served by the site.

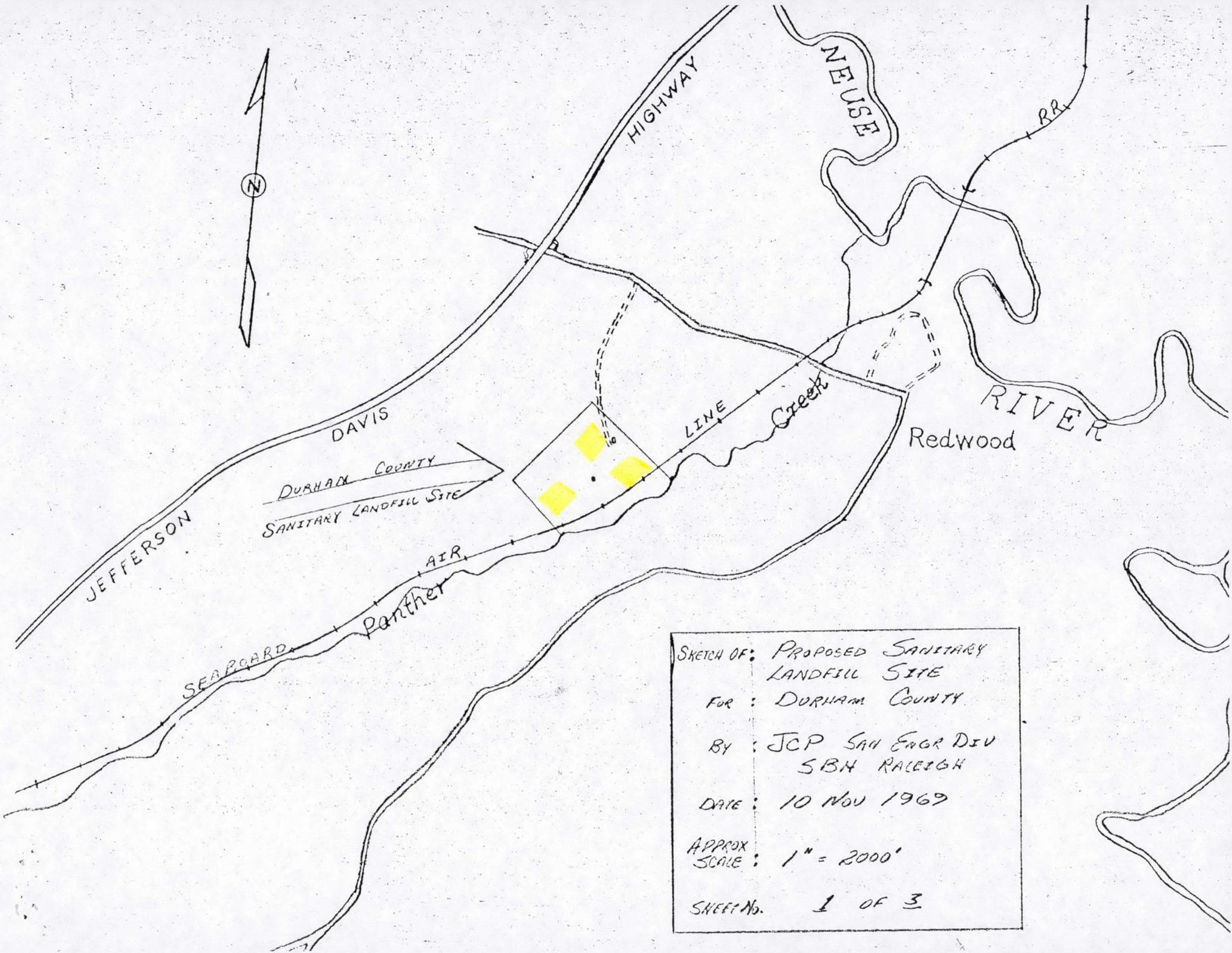
Recommendations:

1. Operate a sanitary landfill. Open, burning dumps are obsolete. Air pollution standards and regulations require that sanitary landfills be maintained properly and not as open dumps.
2. Utilize the area-ramp method of disposal. Drawings accompanying this report will provide amplifying information on the recommended development of the sanitary landfill operation.
3. Maintain a working face width of 30 feet. Increase this only when the volume of refuse received at the site dictates it.
4. Refuse disposal for the served population would require the approximate handling of 450 cu. yds. of refuse uncompacted (112.5 compacted) and the handling of 9.2 cu. yds. of earth material required for the 6" cover on a daily basis. Equipment needed for this requirement would be a minimum of 11-G loader or equivalent with cleats on a full-time basis with an additional tractor to aid with compaction during times of increased landfill loads. A pan will be required periodically to aid with the construction of the dyked area, to place the final 2' cover on the completed sections, and to create cavities for refuse deposit as the

landfill progresses uphill.

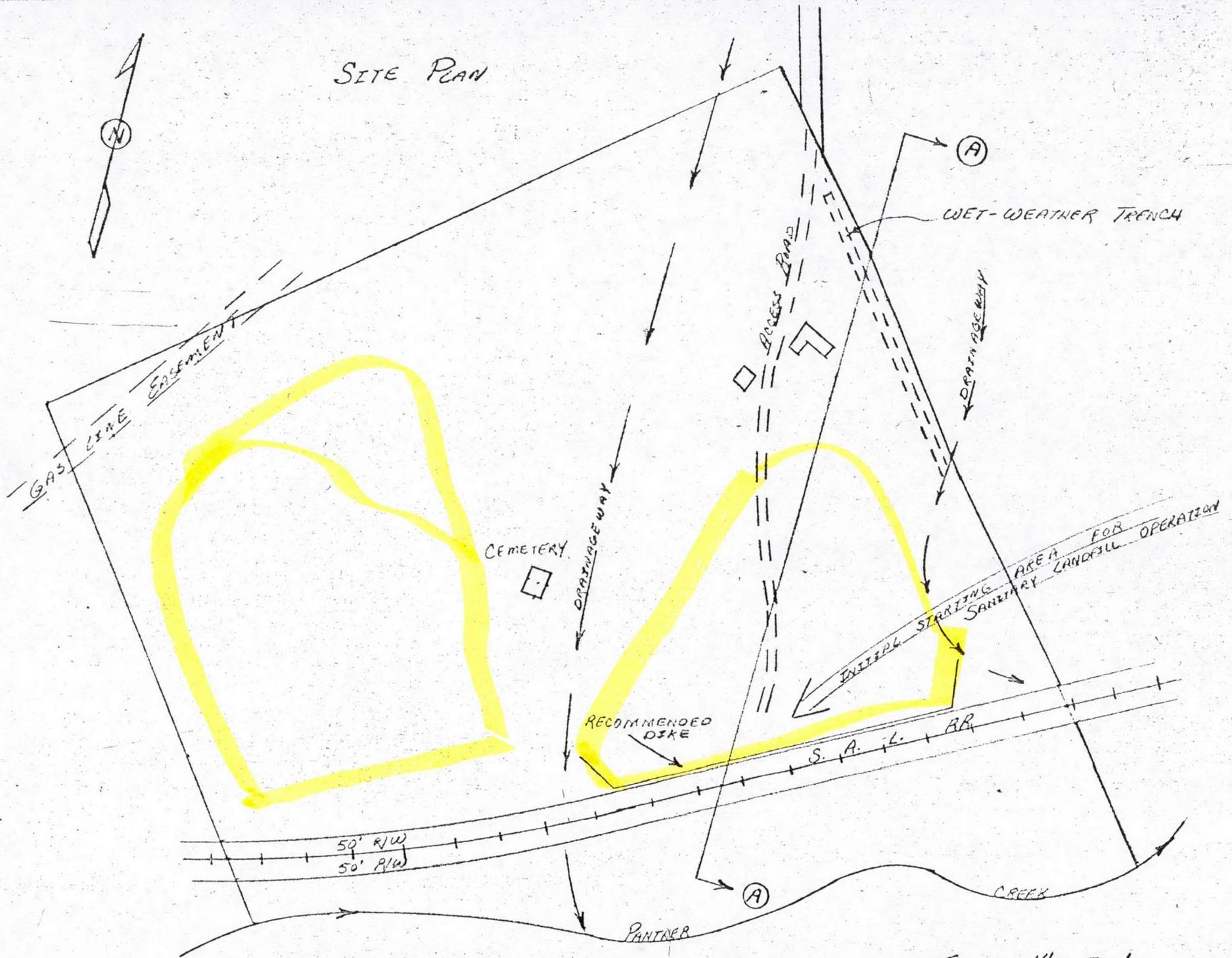
5. Utilize the natural ridge which now has an access road to provide entrance to the disposal area.
6. Thoroughly compact all refuse before covering.
7. Designate a separate area for the disposal of tree limbs, stumps, demolition wastes, etc.
8. No ^{OPEN} burning is to be allowed.
9. Provide an attendant to direct placement of refuse.
10. Provide a gate and provide signs with exact procedures at the site, directing users of the sanitary landfill and providing hours of operation.
11. Provide an equipment shed for storage and maintenance.
12. The area containing the gas line should not be disturbed in any manner.
13. A wet-weather trench should be provided on the upper side of the property near the access road and should be used only when access to the lower property is prohibited.

Note: If industry or other organizations utilize the site and deliver waste material in a condition hard to manage, agreements should be worked out to deliver the waste material in a condition that will not impede or cause hazardous working conditions for the landfill site or its operations. (Some industries are resorting to on-site incineration (meeting air pollution standards) where long haul distances are involved.)



SKETCH OF: PROPOSED SANITARY
LANDFILL SITE
FOR: DURHAM COUNTY
BY: JCP SAN ENGR DIV
SBH RALEIGH
DATE: 10 NOV 1969
APPROX
SCALE: 1" = 2000'
SHEET No. 1 OF 3

SITE PLAN



SCALE: 1" = 300'

SHEET NO. 2 OF 3

