

1989  
LEE CYCLE  
RECYCLING PROGRAM REPORT

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DEPT. OF  
NATURAL RESOURCES

**DATE STAMP**

## INTRODUCTION

This report is being issued at this time to provide supplemental information to the final project report compiled by Commission staff and its consultant, DPRA, Inc. That report was submitted to the Iowa Department of Natural Resources in September, 1989, and included data from December 1, 1988, to July 1, 1990.

This report includes the data for all of 1989.

This report is also being issued to furnish information to the Southeast Iowa Regional Planning Commission and their consultant, RIS/RCC for the development of a regional comprehensive solid waste management plan for Southeast Iowa/Hancock County, Illinois.

Chapter headings, tables and diagrams in this report are labeled the same as the September, 1989, DPRA report.

CHAPTER I

COLLECTION METHODS

COLLECTION METHODS

The recycling program consists of four elements:

1. Residential curbside collection
2. Drop-off
3. Commercial, and
4. Landfill

Another category will be added in 1990:

5. Transfer station

This facility opened in Keokuk, Iowa, on February 22, 1990, and some materials, primarily corrugated, is being separated on the transfer station floor.

Since the DPRA report, curbside collection began in the City of Keokuk on July 10, 1989.

COLLECTION METHOD SUMMARY

	<u>Dec 1988</u>	<u>Pounds Collected</u> <sup>(3)</sup> <u>1989</u>	<u>Total</u>	<u>%</u>
Residential Curbside	14,055	502,095	516,150	20.1
Drop-Off (1)	24,940	1,336,475	1,361,415	52.9
Commercial	23,570	577,800	601,370	23.4
Landfill	5,300	86,910	92,210	3.6
Total . . . . .	67,865	2,503,280	2,571,145	100%
	(33.93T)	(1251.64T)	(1285.57T)	
Wood Wastes	37.20T	304.13T	341.33T	
Total Tons . . . . .	71.13	1555.77	1626.90	

1) Includes yard wastes. Data on yard wastes began in July 1989, when a drop-off container was placed at the recycling center.

2) Wood wastes tonnages calculated from volume conversion of 300 pounds per cubic yard. All wood wastes will be weighed on landfill scales beginning February 1, 1990. Separation of pallets began in mid-summer at 1989.

3) Includes corrugated, newsprint, white paper, glass, tin cans, aluminum, appliances, other ferrous metals, plastics, waste oil, textiles, batteries, and yard wastes.

FORT MADISON CURBSIDE

The residential curbside collection began October 10, 1988, in Fort Madison serving a potential 4,146 households on four route days. LEE CYCLE picks up recyclables on the same day as regular garbage pickup. See table in Chapter 7 for a summary of collection stops.

NOTE: Fort Madison collects waste on Monday and Tuesday with one truck and on Thursday and Friday with two trucks. LEE CYCLE uses one truck on Mondays and Tuesdays and two curbside vehicles on Thursdays and Fridays. There has been some discussion with the City of Fort Madison officials about realigning the routes more evenly once participation rates and volumes increase to a point where the time and effort required by city collection crews can be reduced.

MONTROSE CURBSIDE

On January 4, 1989, Montrose and seven rural subdivisions were added to the curbside collection program. Interestingly, this route showed the highest average set-out rate for the year compared to the Fort Madison routes.

Montrose currently collects their solid waste with a one-ton truck on Tuesdays. The town is considering a three-bag limit per week with additional bags to cost more.

KEOKUK CURBSIDE

On July 10, 1989, the City of Keokuk was added to the program. Chapter 7 shows the number of stops in Keokuk. It should be noted that Keokuk's average set-out rate for the period exceeded the rate in Fort Madison and the Montrose route. This may be attributed to the publicity regarding the City of Keokuk joining the Commission in 1988, the closing of its landfill on July 29, 1989, and the subsequent siting and construction of a transfer station site in Keokuk.

The total number of households now served by LEE CYCLE residential curbside collection program is as follows:

Fort Madison	4,146
Montrose & Subdivisions	495
Keokuk	<u>4,280</u>
Total . . . . .	8,921

EXPANSION OF CURBSIDE PROGRAM

During November and December, the Commission and the cities of West Point and Donnellson reached an agreement to provide curbside collection in those communities beginning January, 1990. During 1989, these communities were serviced with drop-off bins. Figure I and II are copies of press releases for those programs. The decision was made to distribute household containers, brochures, and pick-up schedules to every household in these communities. It is expected that a participation rate exceeding 50% will be achieved. The participation rates will be monitored closely in these two communities during the next few months, and it is anticipated that this method will be used to increase the participation rates on the other routes.

Three hundred-forty containers were distributed in Donnellson on December 20, and 364 containers were distributed in West Point on December 29.

With these additional households, LEE CYCLE will begin 1990 providing residential households service as follows:

Fort Madison	4,146
Montrose	495
Keokuk	4,280
West Point	364
Donnellson	340
Total Households Served . . .	<u>9,625</u>

In addition, an estimated 250 households in rural subdivisions near Keokuk will likely be added in 1990. Apartment complexes are also expected to be added in 1990 that will bring the total number of living units served by curbside to just over 10,000 by the end of 1990.

## DROP-OFF RECYCLING

As shown on Page 1, 52.9 percent of all materials is collected via drop-off. Even when projected 60-80% participation rates in residential curbside occur, it is expected that the drop-off percentage will remain high and may even increase. There are several reasons for this.

- 1) An estimated 70% of Lee County's waste stream is from business and industry. Likewise, more than 50% of the recyclables are from those sectors that may not have the collection services.
- 2) Yard wastes, tires, appliances, and pallets are not collected curbside because of their bulk, so they must be dropped off.
- 3) Yard waste quantities will increase dramatically in 1990 with the new laws. The drop-off quantities will increase accordingly.

Chapter 7 tables break down the quantities delivered to the various drop-off locations operated by the Commission. These locations also include out-of-county sites, such as, Fairfield and Farmington.

The Commission is cooperating with both of these communities to assist them in the development of recycling programs. In Fairfield, residents bring materials to a site every third Saturday for pick up by LEE CYCLE. Farmington residents bring material to a site once per month.

In Lee County, LEE CYCLE refurbished some used dumpsters for recycling containers at a site in Mt. Hamill to complement a set of dumpsters for rural solid waste collection. 3.68 tons were collected at this site with virtually no publicity.

The Commission also services a set of drop bins that rotated every third week between West Point, Donnellson and Denmark. A total of 33.73 tons were collected from these drop sites that were started in January, 1989. As previously mentioned, Donnellson and West Point will be switched to curbside collection in 1990 to increase the participation rate.

Carthage, Illinois, population of 3,000, began a drop-off program in August and brings materials to the recycling center once a week.

During early 1990, LEE CYCLE will expand the drop-off program to include the rest of the rural communities in Lee County. Seven permanent sites will be established as follows:

Wever	Franklin
Denmark	Primrose
St. Paul-Pilot Grove	Argyle
Mt. Hamill-Houghton	

The drop-off units will consist of ten bins mounted on a roll-off frame. The units will be serviced by one of LEE CYCLE'S recycling trucks equipped with a hydraulic hook lift hoist unit. The cost of each unit is \$4,050, and is being manufactured locally by Gregory Equipment.

### COMMERICAL

For this reporting period, the volume of materials collected in this category exceeded the amount collected via residential curbside. In addition, a majority of the materials that were collected via drop-off were from commercial, as well as, the materials separated at the landfill. This also reflects the makeup of commercial waste, for the most part, in the landfill estimated at 60-70%.

For the most, the tonnages collected were from Fort Madison businesses and industries. Commercial collection, as yet, has not been promoted in Keokuk until the opening of the transfer and recycling station in January, 1990.

Figure III lists the businesses and industries that are involved with the LEE CYCLE program.

CHAPTER IV

SECONDARY MATERIAL MARKETS

During 1989, the Commission was able to successfully secure markets for all of the materials, except for tires, wood wastes, and yard wastes.

Tires are being shredded on site and stock piled for possible use on site or transportation to another market. A mobile tire shredder shreds passenger tires for 50¢, and slits truck tires for 75¢. Large equipment tires cannot be processed with the mobile shredder. The mobile tire shredder is owned by Iowa Tire Supply of Carlyle. The Commission charges 50¢ per tire.

Wood wastes have been segregated at the landfill since July 1, 1988. The wood waste stock pile was shredded in September, 1989, by Zein Excavating of La Porte City, Iowa, using a Waste Recycler. This is the same machine that was demonstrated in Carroll, Iowa, at the GRCDA/ISOSWO Conference.

In November, the Commission purchased a Fuel Harvestors tub grinder that will be utilized to process both wood waste and yard waste. Samples of the ground wood and yard waste compost have been obtained by a potential market.

The following table is a list of secondary material markets that the Commission has been in contact with. Organizations with a single asterisk are being utilized as current markets. Organizations with a double asterisk indicate they have been used in the past.

In addition to the markets listed, additional markets are being investigated, such as, shredded newsprint for animal bedding and dry cell batteries.

SECONDARY MATERIAL MARKETS

<u>MATERIAL TYPE</u>	<u>NAME OF ORGANIZATION</u>	<u>CONTACT PERSON</u>	<u>TELEPHONE NUMBER</u>
Corrugated	**City Carton Co. 3 E. Benton Street Iowa City, IA 52440	Andy Ockenfels	800-272-6112
Corrugated	**Consolidated Packaging 1510 18th Street Fort Madison, IA 52627	John Huprich	319-372-3152
Corrugated	*Jefferson Smurfit Container Corp. of America 450 E. North Avenue Carol Stream, IL 60188	Phil Oust	312-260-3600
Corrugated	Stone Container Corp. 2150 Parlane Drive Atlanta, GA 30345	J. M. Clayton	404-621-6700
Corrugated	Quincy Recycle, Inc. 526 S. 6th Street Quincy, IL 62301	Keith Stokes	217-224-2754
Newsprint	Quincy Recycle, Inc. 526 S. 6th Street Quincy, IL 62301	Keith Stokes	217-224-2754
Newsprint	**City Carton Co. 3 E. Benton Street Iowa City, IA 52240	Andy Ockenfels	800-272-6112
Newsprint	*U. S. Gypsum Sperry, IA		
Aluminum	*Tri-Fort Services Jefferson Industrial Park Fort Madison, IA 52627	Marty Peterman	319-372-3023
Aluminum	*Feinbergs 1311 18th Street Fort Madison, IA 52627	Aaron Feinberg	319-372-1634
Batteries	*Feinbergs 1311 18th Street Fort Madison, IA 52627	Aaron Feinberg	319-372-1634

SECONDARY MATERIAL MARKETS-CONT.

Tin Cans	*AMG Resources 459 N. Cline Avenue Gary, IN	H. Allen Pederson	219-949-8150
Tin Cans	*North Star Steel Hwy. 38 & Greens Road Wilton, IA 52778	Dennis Battrum	612-731-5628
Ferrous Scrap	*Alter Metal 2333 Rockingham Road P. O. Box 3068 Davenport, IA 52808	John Gentzkow	319-323-4567
Ferrous Scrap	IBS Peoria, IL		
Palstics	**Polymer Products Box 182, R. R. 3 Iowa Falls, IA 50126	Mark Nesbitt	515-648-5073
Plastics	*Jefferson Smurfit Container Corp. of America 450 E. North Avenue Carol Stream, IL 60188	Phil Oust	312-260-3600
Plastics	Eaglebrook Plastics 2600 W. Roosevelt Road Chicago, IL 60608	Andy Stephens	312-638-0006
Plastics	Midwest Plastics 811 Collins Road Stoughton, WI 52589	David Kowitz	608-873-5402
Plastics	Wellman P. O. Box 188 Johnsonville, SC 29555	Clifton W. Cox	803-386-2011
White Paper/ Computer Paper	Jefferson Smurfit Container Corp. of America 450 E. North Avenue Carol Stream, IL 60188	Phil Oust	312-260-3600
White Paper/ Computer Paper	*City Carton Co. 3. E. Benton Street Iowa City, IA 52240	Andy Ockenfels	800-272-6112

SECONDARY MATERIAL MARKETS-CONT.

<u>MATERIAL TYPE</u>	<u>NAME OF ORGANIZATION</u>	<u>CONTACT PERSON</u>	<u>TELEPHONE NUMBER</u>
Glass	Owens Brockway Streator, IL	Dave Drapp	815-672-3140
Glass	*Quincy Recycle, Inc. 526 S. 6th Street Quincy, IL 62301	Keith Stokes	217-224-2754
Textiles	*Peerless Wiping Cloth 501 Pacific Omaha, NE 68108	Barry Clark	800-222-RAGS
Textiles	*Peerless Wiping Cloth Central States Plant 420 DeSoto St. Louis, MO	Tom Clark	314-421-4487
Textiles	Harry Kaufmann Co. 1544 Iron Street N. Kansas City, MO 64116	Harry Kaufmann	816-421-8244
Tires	Maust & Sons Fibre Fuels Preston, MN	Bob Maust	507-765-2188
Waste Oil	*River City Metal Products 319 S. 14th Street Keokuk, IA 52632	Dan Mahair	319-524-7871
Waste Oil	*Safety-Kleen 1800 78th Ave. W. Rock Island, IL 61201	Davina DelVichio	309-787-2621

MARKET PRICE RANGE

The following prices show the range since materials have been marketed from LEE CYCLE. No distinction is being made whether FOB.

Corrugated	\$30- 55 Ton
Newsprint	\$ 5- 30 Ton
Office Paper	\$ 5-200 Ton
Glass	\$40- 55 Ton
Plastics-	
Pet	.06-.10¢ Pound
HDPE	.08-.14¢ Pound
LDPE	.03-.04¢ Pound
Tin Cans	\$27.50-55 Ton
Waste Oil	(15¢) -0 Gallon..
Tires	(\$55) Ton
Ferrous Scrap	\$40-50 Ton
Aluminum	.42-.82¢ Pound
Batteries	.03-.05¢ Pound
Textiles	.0475-.075¢ Pound.
Wood Pallets	.00-.10¢ Pallet
Wood Chips	\$ 0- 5 Ton

**CHAPTER V**

**PROGRAM COSTS**

PROGRAM COSTS

Table V-I from the DPRA report is the capital costs associated with developing the program in 1988. A \$200,800 grant was received from the Iowa Department of Natural Resources to help finance the project.

In October, 1989, the Lee County Solid Waste Commission issued \$1,500,000 in G. O. Bonds to finance solid waste disposal projects including an expansion of the recycling program estimated at nearly \$415,000. The recycling program expenditures are estimated as follows:

Bale Storage Building & Dock	\$ 50,000
Tub Grinder	\$151,500
Recycling Center Extension	\$ 7,500
Rural Recycling Program	\$ 32,500
Additional Curbside Vehicle	\$ 31,500
Additional Containers	\$ 25,000
Facility Expansion	\$ 63,000
Loan Repayment	<u>\$ 54,000</u>
Total . . . . .	\$415,000

The remainder of the bond issue was to finance a transfer station at Keokuk and landfill improvements at Fort Madison. Although the transfer station at Keokuk is equipped with drop-off recycling facilities and areas for yard waste composting and wood processing, no attempt is being made to assign a portion of these capital costs to the overall costs.

The average annual debt service cost for \$415,000 of the total bond issue is estimated at \$45,725 annually for 15 years. About half of this money was expended in late 1989 with completion of the expansion to occur in late 1990. For this reason, the operating and maintenance costs are being shown with and without debt service.

Table V-1  
Recycling Program Capital Costs.

<u>Capital Costs</u>	<u>Without Grant Dollars (\$)</u>	<u>With Grant Dollars (\$)</u>
Land <sup>(1)</sup>	-0-	-0-
Processing Building <sup>(2)</sup>	111,283.98	47,283.98
Equipment <sup>(3)</sup>	<u>127,817.01</u>	<u>18,017.01</u>
Subtotal	239,100.99	65,300.99
 Indirect Costs		
Engineering	23,700.00	2,700.00
Public Education	<u>5,800.48</u>	<u>4,758.34</u>
Subtotal	29,500.48	7,458.34
 Total (1988 dollars)	 268,601.47	 72,759.33

(1) 2.3 acres donated by the Iowa Department of Corrections

(2) 6,400 square feet. Twenty percent local matching share provided by the Commission

(3) Ten percent local matching share provided by the Commission.

1989  
RECYCLING PROGRAM O & M COSTS

	<u>O &amp; M COSTS</u>	<u>WITHOUT DEBT SERVICE</u>	<u>COST PER TON</u>	<u>WITH DEBT SERVICE</u>	<u>COST PER TON</u>
COLLECTION LABOR (1) (2)		47,797.48	30.72	47,797.48	30.72
PROCESSING LABOR (2)		53,761.34	34.56	53,761.34	34.56
OPERATING COSTS (3)		27,192.43	17.48	27,192.43	17.48
DEBT SERVICE		.00	.00	45,725.00	29.39
GROSS COSTS		128,751.25	82.76	174,476.25	112.15
LESS REVENUES (4)		43,101.49	27.70	43,101.49	27.70
NET COST		<u>85,649.76</u>	<u>55.06</u>	<u>131,374.76</u>	<u>84.45</u>
NET COST/CAPITA (5)		2.14		3.28	
NET COST/HOUSEHOLD (6)		6.85		10.51	
NET COST/HH/MO.		0.57		0.88	

(1) COLLECTION LABOR IS ESTIMATED AT 50-50 FOR RESIDENTIAL CURBSIDE AND COMMERCIAL.

(2) INCLUDES OVERTIME AND FRINGE BENEFITS

(3) FUELS, UTILITIES, PARTS, REPAIRS AND HAULING COSTS.

(4) RECOVERS 33.5% AND 24.7% OF OPERATING COSTS.

(5) ESTIMATED 40,000 POPULATION

(6) 12,500 ESTIMATED HOUSEHOLDS. ANNUAL COST.

RECYCLING COSTS AS PART OF OVERALL BUDGET

Total 1989 Expenditures	\$700,455.00
Recycling Operating Costs	\$128,751.25
% Recycling Costs	18.4%
1989 Recycling Tonnage	1,555.77
1989 Solid Waste Landfilled	<u>33,355</u>
1989 Total Tonnage	34,911
Total Expenditures/Ton	\$21.00
Total Recycling Expenditures/Ton	\$ 3.89

**CHAPTER VII**  
**PROGRAM RESULTS**

PERCENT BY WEIGHT FOR ALL MATERIALS

	<u>Pounds</u>	<u>Ton</u>	<u>%</u>
Corrugated	576,010	288	18.5
Newsprint	534,460	267	17.2
Office Paper	23,470	12	0.8
Mixed (Al., Tin, Plastics)	176,705	88	5.7
Glass	334,855	167	10.7
Textiles	214,105	107	6.9
Batteries	7,765	4	0.3
Waste Oil	29,700	15	1.0
Ferrous Metals	342,110	171	11.0
Tires	58,190	29	1.9
Yard Wastes	205,910	103	6.6
Wood Wastes	608,250	<u>304</u>	<u>19.4</u>
TOTAL . . . . .		1,555T	100.0%

ESTIMATED WASTE DIVERSION RATES

<u>MONTH</u>	<u>RECYCLING TONNAGE</u>	<u>LANDFILL TONNAGE</u>	<u>DIVERSION RATE</u>
Jan.	81	1,529	5.0
Feb.	44	1,363	3.1
Mar.	80	1,587	4.8
Apr.	90	1,504	5.6
May	154	1,733	8.2
June	141	1,882	7.0
July	132	2,011	6.2
Aug.	139	4,882	2.8
Sept.	153	4,290	3.4
Oct.	198	4,821	3.9
Nov.	215	4,153	4.9
Dec.	<u>128</u>	<u>3,600</u>	<u>3.4</u>
TOTALS	1,555	33,355	4.5%

CURBSIDE COLLECTION SUMMARY

	<u>Dec. 1988</u>	<u>1989</u>
Total Number of Stops	835	29,740
Total Pounds Collected	14,055	502,095
Total Tons Collected	7.03	251.05
Average Pounds Per Set-Out	16.8	16.9

Estimated Percent Citizen Participation  
 Rate at End of 1989 . . . . . 30%

Total Number of Curbside Stops in Communities:

	<u>Dec. 1988</u>	<u>1989</u>
Fort Madison	835	15,178
Keokuk	-0-	12,448 (6 Mo.)
Montrose	-0-	1,174
Subdivisions	-0-	940

Pounds of Material Collected by Community:

	<u>Dec. 1988</u>	<u>1989</u>	<u>Pounds Per Stop 1989</u>
Fort Madison	14,055	278,045	18.3
Keokuk	-0-	180,990	14.5
Montrose	-0-	22,586	19.2
Subdivisions	-0-	20,474	21.8

DAILY ROUTE PARTICIPATION

CITY OF FORT MADISON

	<u>MON</u>	<u>TUES</u>	<u>THURS</u>	<u>FRI</u>	<u>TOTALS</u>
<u>WEEK OF</u>	<u>605 HH</u>	<u>680 HH</u>	<u>1,373 HH</u>	<u>1,488 HH</u>	<u>4,146 HH</u>
Jan. 2	60	85	97	132	374
Jan. 16	53	86	91	161	391
Jan. 30	60	92	112	126	390
Feb. 13	45	65	71	150	331
Feb. 27	61	90	99	159	409
Mar. 13	81	97	131	202	511
Mar. 27	84	94	105	163	446
April 10	55	96	135	255	541
April 24	82	122	130	171	505
May 8	75	110	162	275	622
May 22	77	132	145	227	581
June 5	98	128	203	286	715
June 19	95	141	205	273	714
July 3	77	105	183	301	666
July 17	92	119	173	302	686
July 31	96	149	195	305	745
Aug. 14	90	115	157	272	634
Aug. 28	91	121	163	274	649
Sept. 11	99	125	151	274	649
Sept. 25	90	143	181	317	731
Oct. 9	83	119	169	296	667
Oct. 23	92	157	166	325	740
Nov. 6	102	130	166	201	599
Nov. 20	94	132	135	312	673
Dec. 4	91	146	161	274	672
Dec. 18	82	118	111	205	516

TOTAL STOPS	2,105	3,017	3,797	6,238	15,178
NO. OF DAYS	26	26	26	26	26
AVG STOPS/DAY	81.0	116.0	146.0	239.9	583.0
% SET-OUT	13.4	17.1	10.6	16.1	14.1
(1)% PARTICIP.	17.8	22.7	14.2	21.5	18.7

(1) SET-OUT RATE x 33%

DAILY ROUTE PARTICIPATION

CITY OF KEOKUK

Est Part. Set-Outs x 1.333	WEEK OF	% SET-OUT	MON 894 HH	TUES 921 HH	WED 796 HH	THURS 802 HH	FRI 867 HH	TOTAL 4280 HH
	July 10	19.5	132	169	99	177	256	833
	July 24	21.2	164	174	136	174	260	908
	Aug. 7	22.8	173	169	147	202	286	977
	Aug. 21	21.5	192	185	113	209	222	921
	Sept 4	23.3	Coll	Tues 374	128	205	292	999
32.6%	Sept 18	24.5	177	173	155	231	313	1049
33.8%	Oct. 2	25.3	201	177	172	226	308	1084
30.9%	Oct. 16	23.1	185	164	149	221	272	991
31.2%	Oct. 30	23.4	179	170	158	191	303	1001
31.5%	Nov. 13	23.6	205	178	141	198	290	1012
30.7%	Nov. 27	23.0	191	155	150	217	272	985
26.4%	Dec. 11	19.8	171	155	122	171	227	846
26.7%	Dec. 25	19.7	Coll	Tues 260	125	201	256	842
TOTAL STOPS			1,970	2,503	1,795	2,623	3,557	12,448
NO. OF DAYS			12	13	13	13	13	13
AVG STOPS PER DAY			164.2	192.5	138.1	201.8	273.6	957.5
% AVG SET-OUT RATE			18.4	20.9	17.3	25.2	31.6	22.4
1)% AVG PARTICIPATION			24.5	27.9	23.1	33.5	42.1	29.8

(1) SET-OUT RATE x 33%

DROP-OFF COLLECTION SUMMARY - 1989

<u>LOCATION</u>	<u>POUNDS</u>	<u>TONS</u>
Donnellson Drop-Off	34,820	17.41
Denmark Drop-Off	21,665	10.83
West Point Drop-Off	17,425	8.71
Fairfield Drop-Off Project	32,965	16.48
Farmington Drop-Off Project	15,155	7.58
Mt. Hamill Drop-Off	7,360	3.68
Recycling Center Drop-Off	1,207,085	603.54
** (Carthage, IL Drop-Off)	<u>(41,310)</u>	<u>(20.7)</u>
TOTAL	1,336,475	668.24

\*\*Drop-off at recycling center

NEWS RELEASE

The City of West Point and the Lee County Recycling Center (LEE CYCLE) announce the start of recycling in West Point with a curbside collection of recyclables for single and multiple residences beginning Wednesday, January 3, 1990. LEE CYCLE is a program of the Lee County Solid Waste Management Commission of which the City of West Point has agreements for solid waste disposal.

LEE CYCLE'S curbside collection vehicle will pick up newspaper, corrugated cardboard, white paper, glass, plastic, aluminum, tin cans, waste oil, batteries and textiles. Pick up will be bi-weekly (Every other week) according to the schedule shown below. Materials should be prepared according to the instructions in the LEE CYCLE brochure.

LEE CYCLE personnel will distribute containers and brochures to every household in West Point on Thursday, December 21. The program is voluntary so residents who are unable to participate may leave the empty containers out for pickup on Wednesday, January 3.

The Iowa Legislature recently passed laws that will require reduction of solid waste volumes destined for landfills by 25% by 1994 and 50% by the year 2000. With the curbside collection program already operating in Fort Madison, Keokuk and Montrose and a planned expansion of drop-off facilities, Lee County is on its way to achieving these goals.

Fold here and hang near a calendar

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LEE CYCLE 1990 COLLECTION SCHEDULE IN WEST POINT

January	3, 17, 31	July	3*, 18	*Holiday
February	14, 28	August	1, 15, 29	
March	14, 28	September	12, 26	
April	11, 25	October	10, 24	
May	9, 23	November	7, 21	
June	6, 20	December	5, 19	

Recyclables should be set out at the curb by 7:00 A.M. Recyclables are collected by LEE CYCLE crews and are not on any routes or schedules followed by the waste haulers operating in West Point.

In the event of Holidays or bad weather, watch for announcements in the paper or on the radio for rescheduling of pickup days.

LEE CYCLE COLLECTION CREWS -- Tom Fisher and Denise Puckett.  
Questions -- Call LEE CYCLE -- 372-6140 or in West Point call Jim Bethurem, City Administrator -- 837-6313.

NEWS RELEASE

The City of Donnellson and the Lee County Recycling Center (LEE CYCLE) announce the start of recycling in Donnellson with a curbside collection of recyclables for single and multiple residences beginning Tuesday, January 2, 1990. LEE CYCLE is a program of the Lee County Solid Waste Management Commission of which the City of Donnellson has agreements for solid waste disposal.

LEE CYCLE'S curbside collection vehicle will pick up newsprint, corrugated cardboard, white paper, glass, plastic, aluminum, tin cans, waste oil, batteries and textiles. Pick up will be Bi-Weekly (every other week) on the same day as regular garbage pickup and according to the schedule shown below. Materials should be prepared according to the instructions in the LEE CYCLE brochure.

LEE CYCLE personnel will distribute containers and brochures to every household in Donnellson on Wednesday, December 20. The program is voluntary so residents who are unable to participate may leave the empty containers out for pickup on Tuesday, January 2.

The Iowa Legislature recently passed laws that will require reduction of solid waste volumes destined for landfills by 25% by 1994 and 50% by the year 2000. With the curbside collection programs already operating in Fort Madison, Keokuk and Montrose and a planned expansion of Drop-off facilities, Lee County is on its way to achieving these goals.

Fold here and keep near a calendar.

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LEE CYCLE 1990 Collection Schedule in Donnellson

January	2, 16, 30	July	3, 17, 31
February	13, 27	August	14, 28
March	13, 27	September	11, 25
April	10, 24	October	9, 23
May	8, 22	November	6, 20
June	5, 19	December	4, 18

Recyclables will be picked up on the same day as regular garbage pickup. Please have recyclables out at 7:00 A.M. Recyclables will be collected by LEE CYCLE crews and will be collected earlier or later than the regular garbage collection crew to reduce vehicle interference.

In the event of holidays or bad weather, watch for announcements in the paper or on the radio for rescheduling of pickup days. LEE CYCLE COLLECTION CREWS -- Tom Fisher and Denise Puckett. Questions -- Call LEE CYCLE -- 372-6140 in Donnellson call Martha Wellborn, City Clerk -- 835-5714.

FIGURE III

BUSINESS AND INDUSTRY RECYCLING

<u>FIRM</u>	<u>RECYCLING</u>
1. Ameriprint	Printing Paper, News
2. Anchor Metals	Office Paper
3. Gleason Corp.	Corugated
4. The Appliance Doctor	Metals
5. Jim Baier Ford	Corrugated, Plastics
6. Ft. Madison Comm. Hospital	Corrugated
7. Truck Repair	Corrugated
8. Lee Co. Bank & Trust	Office Paper, Newsprint
9. Pizza Hut	Corrugated, Plastic, Tin
10. Sub-Arena	Glass
11. Daylight Donut	Glass, Newsprint
12. Beck Oil Co.	Plastic, Corrugated
13. Sheaffer-Eaton	Corrugated
14. Union Electric	Corrugated, Newsprint
15. Ft. Madison School-Admin.	Office Paper
16. Lee Co. Office Building	Office Paper
17. Ft. Madison City Hall	Office Paper
18. Greenhouse & Flower Cottage	Plastic, Corrugated
19. St. John's Church	Office Paper
20. Building Materials	Corrugated
21. Breens Newstand	Newsprint, Paper, Corrugated
22. Daily Democrat	Newsprint, Corrugated, Oil
23. Chevron Chemical Co.	Plastic, Corrugated, Office Paper, Glass, Newsprint
24. Easter Foods	Glass
25. Rons Grocery	Glass, Corrugated
26. Consolidated Packaging	Metal, Paper
27. Tri-State Furniture	Corrugated, Metal
28. Dodd Printing	Corrugated, Office Paper
29. Du Pont	Pallets
30. El Zarape	Corrugated
31. Faeth Cigar Store	Corrugated, Plastic, Glass
32. Idor Rashid Memorial Library	Newsprint, White Paper
33. Greenwalds Super Market	Glass, Corrugated
34. Halls Ice Cream	Plastic, Tin, Corrugated
35. Gregory Equipment	White Paper
36. Hennigar Excavating	Oil
37. Hoenig CPA Services	White Paper
38. Independent Can Co.	Corrugated
39. Iowa State Penetentiary	Corrugated
40. J & S Electronics	Corrugated
41. Jims Home Service	Corrugated, Metal
42. Johns Siding & Window	Corrugated, Metal
43. Lampe Drug	Corrugated

FIGURE III - CONT.

44.	North Central Public Service	Metal
45.	Olde English Inn	Glass
46.	Pioneer Glass	Corrugated
47.	Ft. Madison Salvation Army	Textiles, Corrugated
48.	Sears-Roebuck	Newsprint, Corrugated, Mixed
49.	Fruehauf Corp.	Corrugated, Paper, Metal
50.	Stone Container	Corrugated, Office Paper
51.	Trellex Morse	Office Paper
52.	Keokuk Hospital	Office Paper
53.	Central Lee Jr. High	Office Paper
54.	Central Lee High School	Office Paper
55.	ISU Extension Service	Office Paper
56.	Lee Co. Soil Conserv. Service	Office Paper
57.	Dahm Chevrolet	Newsprint, Office Paper
58.	Donnellson Implement	Corrugated
59.	Dugans Corner	Corrugated, Plastic
60.	Merschman Furniture	Corrugated
61.	Beebe Greenhouse	Plastic
62.	Ferro-Sil	White Paper

# COLLECTING THE UNUSUAL

**L**EE COUNTY, Iowa is one of many areas where curbside recycling programs have gone beyond the usual glass, paper, aluminum, bimetal cans, plastic, and yard waste. Some communities collect additional items to comply with landfill bans.

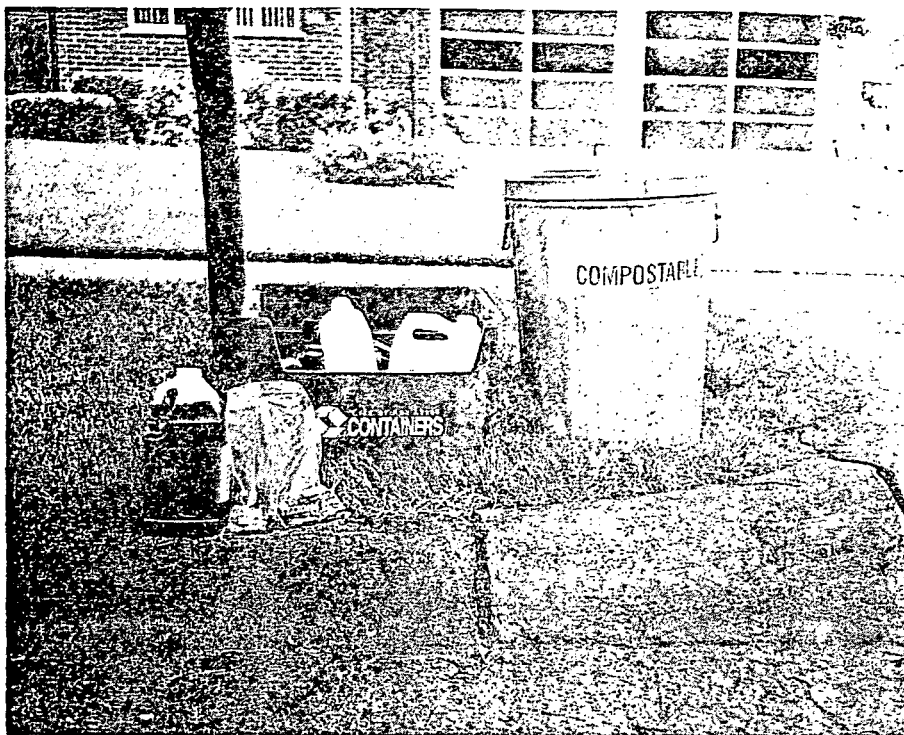
Others want to divert as much waste as possible or avoid problems with disposal of hazardous substances like mercury in household batteries.

Textiles have been collected from the start of Lee County's curbside program in October, 1988. "There weren't any outlets for textiles so they went into a landfill," says Ron Mace, executive director of the Great River Regional Waste Authority that serves Lee County. "Textiles were two percent of the waste stream, and the Salvation Army asked us if we could recycle them. We didn't look at clothes any differently from any other material. If there is a market for something, we recycle it."

Residents place old clothes in clear plastic bags on the curbside, next to other recyclables. Collection crews put them in the front section of the trailer. At the recycling center, the textiles are baled. "They bale more quickly than anything else," Mace says. The bales are shipped to the Central States Wiping Cloth company in St. Louis, which pays from \$120/ton to \$170/ton. Some of the garments are processed into wiping cloths, while others are shipped overseas for reuse.

In Bowdoinham, Maine, textiles are commingled with aluminum cans, glass and other recyclables in a curbside program which began at the end of June, 1992, according to town solid waste manager David Berry. All of these materials have been accepted at the town's dropoff center for the last three years. The recyclables are sorted on a conveyor belt at the town's processing center located in a former poultry barn.

Clothes are placed in a five-gallon can, which is dumped into a box when full, and then periodically sorted. A small percentage of the textiles are sold at a local thrift shop to raise money for the library. Most are baled and marketed to a wiping cloth manufacturer located 20 miles away. "It's not a lucrative market — but we have the avoided cost for disposal," Berry says.



In addition to the normal recyclables and compostables, Ann Arbor, Michigan accepts used motor oil, household batteries and car batteries.

*More municipalities are expanding curbside recycling to include textiles, batteries, motor oil, white goods and mixed paper.*

Robert Steuteville

## DIVERTING HAZARDOUS MATERIALS

Officials in Ann Arbor, Michigan, believe there are two purposes for recycling — waste diversion and proper handling of hazardous materials. "I think that's a tribute to the fact that the recycling movement in Ann Arbor has always been linked to the environmental movement here in town," explains Bryan Weinert, the city manager for resource recovery. "The environmental groups shaped a lot of what was done (in recycling) over the years."

For that reason, the city began collecting motor oil at curbside in the early 1980s, one of the first communities to do so, Weinert says. Residents use milk jugs with screw-top lids to prevent oil from leaking out on route to the recycling center. A firm picks up about 20,000 gallons annually from the city at no charge, and reprocesses it back into lubricating oil.

Ann Arbor also collects automobile batteries and household batteries, both at curb-

side and at a dropoff site. The annual totals are about 1,200 auto batteries and eight tons of household batteries. The latter are enclosed in a plastic bag or sealed container by residents, Weinert says. They are placed in a separate cage in the recycling truck, which also holds the auto batteries and motor oil.

At the recycling center, city workers separate out the "button" batteries (for hearing aids and other devices) and the rechargeable nickel cadmium batteries. Those two varieties, which amount to 10 to 15 percent of the household batteries, are recyclable. The remainder are sent to a local hazardous waste landfill. The landfill operator, in a goodwill gesture, does not charge the city a fee.

Spokane, Washington, burns its garbage in an 800 ton per day waste to energy plant. In the interest of controlling heavy metal emissions, the city collects household batteries along with other recyclables in a commingled curbside program. Residents put the batteries in a plastic bag, which they place on top of other recyclables in a bin. The recycling truck operator separates the materials from the bin into compartments on the truck. Batteries are placed in their own container, and are later sorted by city workers who have been trained by a hazardous waste technician, explains Jessie Lang, Spokane's recycling coordinator.

Only button batteries, about one percent of the volume, are recycled. They are shipped to Mercury Refining, a firm in Latham, New York, which pays the city enough to cover shipping costs. The remainder of the batteries — alkaline, dry cell and nickel-cadmium — are stored in drums. An inert packing material absorbs acid leakage and prevents batteries, some of which still contain a charge, from touching each other and heating up, Lang says. Spokane pays \$612 a ton to dispose of the batteries in a hazardous waste landfill.

#### DO IT YOURSELFERS

A lot of people in Sunnyvale, California, change the oil in their automobiles, according to Rich Gurney, the city's recycling coordinator. The 116,000 residents in this city south of San Francisco do not have to worry about where to dispose of this liquid. Since 1984, the city began collecting oil at curbside along with other recyclables. Residents can use their own nonbreakable, sealed gallon containers, or obtain them from the city. Milk jugs are commonly used.

City recycling crews place the jugs into a containment tray on the truck. They are emptied into a 2,000 gallon holding tank at the city recycling center. About 40,000 gallons per year are collected. Evergreen Oil, in Hayward, California, picks up the oil free of charge and reprocesses it into lubricating oil, Gurney says.

Sunnyvale plans to start collecting oil filters after new recycling trucks are purchased at the end of the year. The details of how the filters will be handled have not been

worked out yet, but the city has an end user. Tamco, a firm in Los Angeles, crushes oil filters and uses the metal to produce steel bars for concrete reinforcement, explains Gurney.

Missouri landfill bans that went into effect last year were the impetus for curbside collection of automobile and boat batteries, white goods and motor oil in Columbia. About 10 to 15 batteries are collected per month, according to Cheryl Crafton, the city waste minimization officer. The batteries are placed on a special tray on the recycling truck. The city workers wear gloves to protect their hands from acid, the only special handling needed, Crafton says.

They are sold for about \$1 a piece to a local firm called Battery Man, which refurbishes and resells a portion of them. Those that are deteriorated beyond refurbishing are sold by the firm to the Doe Run company of Boss, Missouri, which separates the plastics, metals and acids, and recycles the materials into new batteries.

The white goods include most large household appliances — refrigerators, freezers, air conditioners, ovens, stoves, washers and dryers. They are collected by a separate flat bed truck with a boom lift. About 60 per month are picked up from residents, who arrange for pickups and pay a \$5 fee. Residents are asked to carry the appliances to the curbside, although city workers will make the pickup from inside the house if necessary. The capacitors, which contain hazardous waste, are stripped from the appliances and disposed of by the city at a hazardous waste landfill for about \$700 per ton. A contractor picks up the remaining scrap metal and markets it.

#### MOTIVATED BY DUMPING

The problem of illegal dumping was a motivating factor for Charlotte, North Carolina, to start collecting white goods at curbside, according to Wayman Pearson, the city director of solid waste services. "We have found that if you don't give the residents a means of disposal, you will have to pick up the appliances anyway, but you will be picking them up from illegal dump sites," Pearson says. White goods were banned from landfills three years ago. Residents can call the city and schedule a pick up of large appliances for no charge.

They are taken to a county owned recycling site. The capacitors are removed by county workers, and the metal bodies are sold to a scrap dealer.

Probably nowhere but in Portland, Oregon, has a Volkswagen Beetle been collected through a curbside recycling program. Franchised haulers in the city are required by law to collect pieces of scrap metal that cannot exceed a cubic 30 inches. One resident decided he would get rid of a broken down VW in this manner. "He found out exactly what the dimension was — and started parceling it out week by week in 30-inch squares," according to Bruce Walker, the recycling program manager.

Portland, Oregon collects pieces of scrap metal smaller than 30 cubic inches at curbside. One methodical resident set out an entire Volkswagen Beetle, one load at a time.

Redmond and Bellevue, Washington include milk cartons, aseptic drink containers and frozen food boxes in their curbside collection program.

More commonly, residents leave bits of plumbing fixtures, Walker says. The scrap metal is only a very small part of the city's curbside recycling program — accounting for a maximum of 13 tons out of 2,500 tons collected each month. It is more of a service to residents, who place the scrap metal in a bucket with bimetal cans, or leave it next to the bucket. The haulers generally throw it in the truck with the cans, and separate it out later at one of the private recycling processing centers scattered throughout the Portland area. The material is easy to handle and readily marketable, Walker adds. Oregon's state recycling law, which went into effect in 1986, mandated that scrap metal be recycled.

**FROZEN FOOD BOXES**

A small but growing number of municipalities have included milk cartons and aseptic drink packages in curbside collection programs. Redmond and Bellevue, two neighboring cities in Washington, have taken this a step further with the collection of

frozen food boxes. "They are made of the same material as milk cartons and aseptic containers, and so we asked 'why not add them, too?'" says Scott Thomas, director of Redmond's recycling program. The two cities contract with the same recycler, Fibers International, of Bellevue.

Milk cartons and frozen food boxes are made of polycoated paper (paper coated with plastic). Aseptic packages consist of polycoated paper with an additional layer of aluminum — and have been considered difficult to recycle. But Thomas says that Weyerhaeuser Paper Co. is willing to pay \$140 a ton for these materials baled together — so they are among the most marketable of the city's recyclables.

Adding these packages to the curbside program costs the city between two and five cents per household each month. In the third month, May, 1992, Redmond collected one ton of those materials, commingled with bottles, cans and other containers. A survey concluded that milk cartons make up about two thirds of the polycoated packaging collected in Redmond. Frozen food boxes amount to 25 percent, and aseptic containers less than 10 percent. Residents have a tendency to crush these containers, which will make them less expensive to transport back to the recycling facility, explains Thomas.

With landfill tipping fees of \$110 a ton, Atlantic County, New Jersey, can well afford to spend \$5 a ton to recycle phone books, catalogs, mail and magazines. All these items are collected at the curbside throughout the year, commingled with newspapers, according to Brian Lefke of the county Utilities Authority. The mixed paper (#6 news) is sorted on a conveyor line at the recycling center to pick out contaminants, baled, and marketed domestically and internationally.

Household batteries also are collected curbside in ziplock bags. Since October, the county has collected nine 55-gallon drums of the batteries, but has yet to ship them. The nickel-cadmium and button batteries will be recycled. The rest will be disposed of in a hazardous waste facility, Lefke says. Keeping household batteries out of the solid waste stream will help to avoid heavy metal emission problems at a waste to energy plant where the county plans to send 20 percent of its waste.

Able Sanitation Inc., which provides recycling services to residents in suburbs of Grand Rapids, Michigan, collects phone books and magazines at curbside. Those items are commingled with other recyclables — including newspapers, aluminum cans, bimetal cans and plastic bottles. The phone books, magazines and newspapers are delivered to Nu-Wool Insulation, located across the street from Able in Genison, Michigan. "It really cuts down on transportation costs," says Brian VanderArk, the recycling coordinator for Able. Nu-Wool processes the phone books and newspapers into insulation. The magazines are marketed to paper mills.

announcing the

# BIOCYCLE

## CONFERENCE SCHEDULE

<b>1992</b>	<b>1993</b>
<p><b>BioCycle Northeast Conference '92</b>          SEPTEMBER 9, 10, 11, 1992          ALBANY, NEW YORK          Albany Marriott</p> <p><b>BioCycle Southeast Conference '92</b>          NOVEMBER 16, 17, 18, 1992          MIAMI BEACH, FLORIDA          Doral Ocean Beach Resort</p>	<p><b>BioCycle West Coast Conference '93</b>          MARCH 1, 2, 3, 1993          SEATTLE, WASHINGTON          The Westin Hotel</p> <p><b>23rd Annual BioCycle National Conference</b>          MAY 12, 13, 14, 1993          MINNEAPOLIS, MINNESOTA          Hyatt Regency</p>

Circle these important dates on your calendar.  
 Watch for program information and complete details  
 in upcoming issues of BioCycle and your mail.

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## FACT SHEET

### "LEE CYCLE" MATERIALS RECOVERY PROGRAM

- SERVICE AREA - Lee County, Iowa (Map Attached)
- OPERATOR - LEE CYCLE is operated by the Lee County Solid Waste Management Commission. The Commission was formed by a 28-E Agreement between Lee County and the City of Fort Madison in 1980 for the management of solid waste disposal facilities. In June of 1988, the City of Keokuk joined the Solid Waste Management Commission. Plans call for the construction of a transfer station/recycling center/yard waste composting facility in the Keokuk area during 1989. Keokuk's landfill will have reached capacity and be closed in mid 1989.
- RECYCLING PROGRAMS - Besides intermediate processing of recyclables at a new recycling center, LEE CYCLE provides for A) residential curbside collection, B) drop-off facilities at the center and in small towns and rural areas, C) commercial collection and D) limited separation of rich material from the landfill. All programs are voluntary.

#### A) RESIDENTIAL CURBSIDE COLLECTION

COMMUNITIES SERVED - Fort Madison, Montrose and adjoining subdivisions since October, 1988. Keokuk will be added in mid 1989.

#### POPULATION AND HOUSEHOLDS SERVED

Fort Madison -	13,000 population -	4,000 H.H.
Montrose -	900 population -	275 H.H.
Keokuk (summer 1989) -	13,500 population -	4,200 H.H.

COLLECTION FREQUENCY - bi-weekly (every other week) on the same day as regular garbage pick-up.

CONTAINERS PROVIDED - a burlap bag for aluminum, tin and plastic and a plastic bucket for glass. Other materials are prepared as described in the attached brochure.

RECYCLABLES ACCEPTED - Corrugated cardboard, newsprint, glass, aluminum, tin cans, plastics (HDPE, PET, LDPE), clothing rags, waste oil and batteries.

## PROGRAM GOALS AND ACCOMPLISHMENTS

The Lee County Recycling Center was funded in part with the aid of a \$200,800 grant from State of Iowa Oil Overcharge funds. The program is a demonstration project in that it was the first recycling program in Iowa to offer a multi-material curbside collection service as well as drop-off facilities.

During the first two months of operations dozens of communities have visited or inquired about the facility. As interest in recycling increases, the facility will easily accomplish a primary goal - to be a demonstration project.

A further goal of the Solid Waste Management Commission is to maximize recycling efforts before other alternatives such as RDF and/or composting are implemented. The Commission is currently developing a Comprehensive Solid Waste Management Plan with other Southeast Iowa counties.

The Commission hopes to reach a goal of 25% waste reduction by recycling within three to four years. However, this may be a combined effort with other local groups that are also recycling and with more development of in-house recycling in the industrial sector.

## HISTORY

LEE CYCLE is here today because of initial efforts in recycling by the Solid Waste Management Commission when the new landfill was opened in 1980. Bulky appliances, aluminum and batteries were removed and sold for scrap. In 1982, a used downstroke chain press baler was purchased for baling corrugated. In 1986, a used 60" downstroke baler was purchased. In April of 1987, other recyclables were added including newsprint, plastic milk jugs, glass, tin cans and waste oil. Textiles were added in the Fall of 1987.

These efforts led gradually to a local awareness that recycling would become an important aspect of waste management in Lee County. The location of markets as the program expanded, supported the Commissions decision to apply for the grant to expand the program.

## OTHER SOLID WASTE MANAGEMENT PROGRAMS

Wood Recycling - Currently all wood and brush waste is stockpiled in a storage area for drying. This material will be chipped for use as mulch or a bulking agent in sludge composting. Wood chip fuel markets will be explored.

COLLECTION EQUIPMENT - 1988 1-ton Ford Diesel with HL-3N Multi-Lift Hydraulic hook lift hoist unit that carries a 3 unit compartmentalized bin of 10 C.Y. capacity. The truck unit pulls an 18' stock trailer equipped with four 2.5 C.Y. bins that are loaded and unloaded with the lift truck.

Complete curbside collection unit cost - \$31,500.

CREW SIZE - one driver/collector.

## B) DROP-OFF RECYCLING FACILITIES

### RECYCLING CENTER

2.5 C.Y. bins are located at the recycling center for newspaper, corrugated, office paper, rags and mingled tin, aluminum and plastics. 55 gallon drums are used for glass and waste oil. A new waste oil tank is scheduled for 1989. Used dumpsters are used for tires and appliances. Cost for five 2.5 C.Y. bins @ \$277 each = \$1385.

### RURAL DROP-OFF FACILITIES

Five 3 C.Y. bins are rotated weekly between Donnellson, West Point and Denmark for use by those towns and surrounding rural population. The bins are moved with the Ford truck and a 16' flat-bed trailer equipped with a winch. Two 2 C.Y. and two 3 C.Y. bins are used at a solid waste collection point in Mount Hamill. These facilities do not provide for collection of waste oil, batteries or rags.

These sites will eventually all have permanent containers that will replace the rotation method. Five 3 C.Y. bins @ \$470.

- C) COMMERCIAL COLLECTION - 60-70% of the Lee County waste stream is generated by business and industry. Those that generate significant quantities can ask for a waste stream analysis and recommendations on how to participate in the LEE CYCLE program. Over 50 businesses and industries were participating at the end of 1988. Two hook lift containers can provide service for commercial generators. Other types of container systems are being explored. Commercial collection is operated by the same driver after residential collection.

D) LANDFILL SEPARATION - Some loads of recyclable rich materials are separated at the landfill working face. These materials (primarily corrugated) are loaded into a dump truck or trailer and taken to the recycling center. Landfill employees accomplish this task.

° RECYCLING CENTER - The main building is a 60' X 80' insulated metal structure with a 20' X 80' X 8' six unit concrete bunker storage bin built into the east wall. The 8' concrete back wall provides for a concrete push wall on the inside. The main roof carries over the concrete bunkers. Two 16' X 14' overhead doors are operated by remote control from the lift truck for ease in moving materials from inside the building to the storage bunkers. The bunkers are designed to hold clear, brown and green crushed glass, crushed tin cans, other metals and miscellaneous storage.

Building Cost - \$103,000.

EQUIPMENT FOR PROCESSING

- ° Cat V-40D Hydraulic Lift Truck with Waldon Hydraulic Rotator. \$27,000.
- ° Manual separation system for mingled materials (alum., tin, plastics)
  - 30' used Kewanee Farm Elevator \$350.
  - 28' C.Y. Surge Bin manufactured locally \$2,600.
  - 10' Variable Speed Slider Belt Conveyor \$1,950.
  - REM 15' Magnetic Separator \$2,350.
  - 13 - 2.6 C.Y. Bins on castors equipped w/fork receptacles and manufactured locally \$277/each. \$3,601.
  - Three 8'x 8'x 8' Metal Wire Mesh Storage Bins manufactured locally. \$1275/each. \$3,825.
  - 20 H.P. J. V. Manufacturing Cram-A-Lot Horizontal Baler \$20,781.
  - Prodeva Model 270 Can Crusher \$5,200.
  - Two used Downstroke Balers \$2,000.
  - 8' X 16' used Livestock Scales w/new Digital Load Scale \$6,000.
  - Miller GB1000 Glass Crusher \$3,000.

Yard Waste Composting - Residents are urged to separate their leaves and grass for free disposal at the yard waste composting area. An estimated 86 tons in 1987 and 54 tons in 1988 were composted.

Sludge Composting - Sewage sludge from the Fort Madison Wastewater Treatment Plant and a sawdust waste bulking agent are composted for use as topsoil additive. Approximately 5500 tons (wet) were composted in 1987 and 4500 tons in 1988.

