

Chapter 9: Maryville

COMMUNITY PROFILE

The City of Maryville is located in the Northwest corner of Missouri and is the county seat for Nodaway County. Maryville is a member of Northwest Missouri Solid Waste Management District (District A). A majority (89%) of the waste samples examined during all three sorts were generated in the city of Maryville.

Maryville is the largest city in the county with a population of 10,709, and is the home of Northwest Missouri State University. Agri-business, university related retail and service businesses, and two large manufacturers (Kawasaki and Eveready) are the primary industries.

Maryville is located on highway 71. It is 95 miles north of Kansas City, 348 miles northwest of St. Louis, and 260 miles north of Springfield

Demographics:

	Maryville	Nodaway County
Area (sq. miles)	4.4	77
Population (1992)	10,663	21,236
Density (per sq. mile)	2423	24
Pop. Change since 1980	11.6%	-3.5%
Number of households	3545	7620
Persons per household	2.3	2.48
High school graduates	83.3%	80.7%
Median Family Income	\$27,829	\$26,437
Percent below poverty level	26.9%	21.8%

Solid waste collection

Solid waste is collected by several private waste haulers in the Maryville area. The city licenses the haulers but does not franchise or set up collection zones. All waste haulers are required to offer curbside recycling to their customers.

Solid waste disposal

The City of Maryville owns and operates the landfill which is located two miles north of the city on highway 71. The landfill accepts waste from Maryville and the surrounding counties. The current tipping fee for solid waste is \$56 per ton. This is the highest tipping fee in Missouri. No tipping fee is charged for Recyclable material. The landfill receives approximately 12,000 tons of solid waste per year.

Waste reduction and recycling programs

The City of Maryville has one of Missouri's most aggressive recycling programs. The Regional Recycling Center (RRC) was built by the City of Maryville and accepts paper, glass, plastic containers, aluminum containers, and steel cans. The RRC supplies paper to the university who pelletizes the paper and uses it for fuel. The RRC processes approximately 7500 tons of material per year. In addition there are several small recycling operations in the District. These include, William's Recycling, David Recycling, and two opportunity workshops.

The City of Maryville also operates a yard waste composting facility at the landfill.

Maryville Results

Information about sample size and composition are listed in tables 9-1 through 9-8

All weights are listed in pounds and all volumes are in cubic feet.

SORT # 1

Sort Conditions

The first sort was conducted March 18th through the 22nd. The sort facility was set up in the landfill just above the unloading area. Weather conditions were harsh, including cold, wind, and snow flurries. The third day was shortened due to these extreme weather conditions.

conditions.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	2,839.4
Significance Test Results	.000
Number of Samples	14

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	11	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	18	Gardening/Yard Care Products	1
Household Cleaning Products	4	Pet Groom Products	2
Sharps/Blades	2	Disposable Razors	25
Syringes	180	Alkaline Batteries	67
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	4
Aerosol Cans	3		
Miscellaneous items: 1 jar of silver cleaner, 1 package of fireworks, 1 fluorescent tube, 1 nebulizer, 13 partial bottles of perm solution, 1 oxygen mask.			

**MARYVILLE
SORT #1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	122	35.6	100%	0%	Curb side/drop off	Maryville
2	102	29.1	100%	0%	Curb side/drop off	Maryville
3	188	41.8	90%	10%	Curb side/drop off	Maryville
4	230	55	100%	0%	Curb side/drop off	Maryville
5	182	57.6	90%	10%	Curb side/drop off	Maryville
6	195.9	39	100%	0%	Curb side/drop off	Maryville
7	185	54	75%	25%	Curb side/drop off	Maryville
8	209	76	100%	0%	Curb side/drop off	Ravenwood
9	254	58	100%	0%	Curb side/drop off	Maryville
10	244	80.3	100%	0%	Curb side/drop off	Maryville
11	231	54.5	100%	0%	Curb side/drop off	East of Maryville
12	263.5	88.5	100%	0%	Curb side/drop off	Maryville
13	222	65.2	100%	0%	Curb side/drop off	Maryville
14	211	67.4	100%	0%	Curb side/drop off	Maryville
TOTALS	2839.4	802.0				
AVERAGE	202.8	57.3	96%	4%		

TABLE 9-1

MARYVILLE

SORT # 1

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	92.2	64.0	6.6	4.6	3.25%	7.98%
Newsprint	110.5	36.0	7.9	2.6	3.89%	4.49%
Magazines	44.0	9.8	3.1	0.7	1.55%	1.22%
High Grade	32.0	16.0	2.3	1.1	1.13%	2.00%
Mixed	516.1	186.0	36.9	13.3	18.19%	23.20%
PAPER TOTALS	794.8	311.8	56.8	22.3	28.01%	38.89%
Clear	51.5	6.8	3.7	0.5	1.82%	0.84%
Brown	43.2	4.8	3.1	0.3	1.52%	0.60%
Green	3.5	0.5	0.3	0.0	0.12%	0.06%
Other	19.8	5.3	1.4	0.4	0.70%	0.66%
GLASS TOTALS	118.0	17.3	8.4	1.2	4.16%	2.16%
Alum. Cans	13.6	7.2	1.0	0.5	0.48%	0.90%
Other Alum	25.0	13.8	1.8	1.0	0.88%	1.71%
Non ferrous	10.3	1.8	0.7	0.1	0.36%	0.22%
Food Cans	28.8	8.2	2.1	0.6	1.01%	1.02%
Ferrous	44.2	9.9	3.2	0.7	1.56%	1.23%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
METAL TOTALS	121.8	40.9	8.7	2.9	4.29%	5.10%
PET # 1	19.5	15.3	1.4	1.1	0.69%	1.91%
HDPE # 2	34.0	25.4	2.4	1.8	1.20%	3.17%
Film	90.5	64.0	6.5	4.6	3.19%	7.98%
Other Plastic	234.3	134.8	16.7	9.6	8.26%	16.81%
PLASTIC TOTALS	378.3	239.5	27.0	17.1	13.33%	29.87%
Food Waste	723.0	59.5	51.6	4.3	25.48%	7.42%
Wood Waste	16.4	4.5	1.2	0.3	0.58%	0.56%
Textiles	62.5	23.4	4.5	1.7	2.20%	2.92%
Diapers	186.2	35.7	13.3	2.5	6.56%	4.45%
Other Organics	138.5	26.5	9.9	1.9	4.88%	3.31%
ORGANIC TOTALS	1126.6	149.6	80.5	10.7	39.71%	18.65%
Fines	196.0	30.0	14.0	2.1	6.91%	3.74%
Other Inorganics	102.0	12.8	7.3	0.9	3.59%	1.60%
INORGANIC TOTALS	298.0	42.8	21.3	3.1	10.50%	5.34%
GRAND TOTAL	2837.3	801.8	202.7	57.3	100.00%	100.00%

TABLE 9-2

SORT # 2

Sort Conditions

The second sort was conducted June 24th through the 26th. The sort facility was set up on a grassy area close to the entrance of the landfill. Samples were transported to and from the sort facility by trailer. Weather conditions were sunny and very warm.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	2,816.7
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
over-the-counter Medication (OTC)	21	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	25	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	22	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	21
Syringes	11	Alkaline Batteries	34
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: 2 bullets, 1 thermometer, 2 packages of firecrackers, 1 lighter.			

**MARYVILLE
SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	210	46.5	100%	0%	Curbside/ Drop-off	Maryville
2	298	67.4	100%	0%	Curbside/ Drop-off	Maryville
3	215	51.9	100%	0%	Curbside/ Drop-off	Maryville
4	165	41	100%	0%	Curbside/ Drop-off	Maryville
5	232.5	39.1	100%	0%	Curbside/ Drop-off	Maryville
6	173.2	47.1	100%	0%	Curbside/ Drop-off	Maryville
7	275	60	100%	0%	Curbside/ Drop-off	Maryville
8	234	42.4	100%	0%	Curbside/ Drop-off	Maryville
9	216	46.9	100%	0%	Curbside/ Drop-off	Maryville
10	297	63.6	100%	0%	Curbside/ Drop-off	Maryville
11	267	88.6	100%	0%	Curbside/ Drop-off	Maryville
12	234	51.7	100%	0%	Curbside/ Drop-off	Maryville
TOTALS	2816.7	646.2				
AVERAGE	234.7	53.9	100%	0%		

TABLE 9-3

CATEGORY	MARYVILLE				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	153.5	73.0	12.8	6.1	5.45%	11.30%
Newsprint	68.0	12.1	5.7	1.0	2.41%	1.87%
Magazines	41.5	3.4	3.5	0.3	1.47%	0.53%
High Grade	34.2	5.7	2.9	0.5	1.21%	0.88%
Mixed	491.5	129.5	41.0	10.8	17.45%	20.04%
PAPER TOTALS	788.7	223.7	65.7	18.6	28.00%	34.62%
Clear	25.5	2.3	2.1	0.2	0.91%	0.36%
Brown	19.0	1.8	1.6	0.2	0.67%	0.28%
Green	3.0	0.2	0.3	0.0	0.11%	0.03%
Other	32.5	3.0	2.7	0.3	1.15%	0.46%
GLASS TOTALS	80.0	7.3	6.7	0.6	2.84%	1.13%
Alum. Cans	12.0	2.2	1.0	0.2	0.43%	0.34%
Other Alum	28.0	5.3	2.3	0.4	0.99%	0.81%
Non ferrous	5.0	0.5	0.4	0.0	0.18%	0.08%
Food Cans	44.5	8.6	3.7	0.7	1.58%	1.33%
Ferrous	39.5	7.0	3.3	0.6	1.40%	1.08%
Oil Filters	7.0	0.6	0.6	0.1	0.25%	0.09%
METAL TOTALS	136.0	24.2	11.3	2.0	4.83%	3.74%
PET # 1	21.0	9.3	1.8	0.8	0.75%	1.44%
HDPE # 2	36.5	18.3	3.0	1.5	1.30%	2.83%
Film	105.0	58.0	8.8	4.8	3.73%	8.98%
Other Plastic	235.0	106.5	19.6	8.9	8.34%	16.48%
PLASTIC TOTALS	397.5	192.1	33.1	16.0	14.11%	29.73%
Food Waste	764.5	90.5	63.7	7.5	27.14%	14.01%
Wood Waste	24.0	3.7	2.0	0.3	0.85%	0.57%
Textiles	127.0	27.1	10.6	2.3	4.51%	4.19%
Diapers	221.0	26.7	18.4	2.2	7.84%	4.13%
Other Organics	145.0	32.9	12.1	2.7	5.15%	5.09%
ORGANIC TOTALS	1281.5	180.9	106.8	15.1	45.49%	28.00%
Fines	89.5	14.7	7.5	1.2	3.18%	2.28%
Other Inorganics	44.0	3.3	3.7	0.3	1.56%	0.51%
INORGANIC TOTALS	133.5	18.0	11.1	1.5	4.74%	2.79%
GRAND TOTAL	2817.2	646.2	234.8	53.8	100.00%	100.00%

TABLE 9-4

SORT # 3

Sort Conditions

The third sort was conducted on October 21 through the 23. The sort facility was set up just inside the entrance to the landfill. Weather conditions included high winds, and eight inches of wet snow. The sort was cut short due to the extreme weather conditions which made collecting samples very difficult.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	2,366.1
Significance Test Results	.000
Number of Samples	8

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	5	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	1	Disposable Razors	6
Syringes	5	Alkaline Batteries	5
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	3
Aerosol Cans	0		
Miscellaneous items: None.			

**MARYVILLE
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	210	55.2	90%	10%	Curbside/Drop-off	Maryville vicinity (rural)
2	222	63.1	90%	10%	Curbside/Drop-off	Cargill (rural)
3	233	49.3	100%	0%	Curbside/Drop-off	Maryville
4	189.5	43.4	100%	0%	Curbside/Drop-off	Maryville
5	270	65	100%	0%	Curbside/Drop-off	Maryville
6	241.5	50.4	100%	0%	Curbside/Drop-off	Maryville
7	144	41.3	100%	0%	Curbside/Drop-off	Maryville
8	202	38.2	100%	0%	Curbside/Drop-off	Maryville
TOTALS	1712	405.9				
AVERAGE	214	50.7	97%	3%		

TABLE 9-5

MARYVILLE					SORT # 3	
CATEGORY	TOTALS		AVERAGE		Pct. by wt.	Pct. by vol.
	wt.	vol.	wt.	vol.		
Cardboard	89.5	44.0	11.2	5.5	5.23%	10.84%
Newsprint	77.5	15.8	9.7	2.0	4.53%	3.89%
Magazines	39.1	4.6	4.9	0.6	2.29%	1.13%
High Grade	37.5	11.1	4.7	1.4	2.19%	2.72%
Mixed	268.8	82.2	33.6	10.3	15.71%	20.25%
PAPER TOTALS	512.4	157.7	64.0	19.7	29.96%	38.84%
Clear	43.5	3.4	5.4	0.4	2.54%	0.84%
Brown	26.2	2.7	3.3	0.3	1.53%	0.67%
Green	8.0	0.8	1.0	0.1	0.47%	0.20%
Other	15.0	1.2	1.9	0.2	0.88%	0.30%
GLASS TOTALS	92.7	8.1	11.6	1.0	5.42%	2.00%
Alum. Cans	21.5	6.6	2.7	0.8	1.26%	1.63%
Other Alum	27.0	10.5	3.4	1.3	1.58%	2.59%
Non ferrous	10.0	0.6	1.3	0.1	0.58%	0.15%
Food Cans	45.7	9.3	5.7	1.2	2.67%	2.29%
Ferrous	17.5	2.4	2.2	0.3	1.02%	0.59%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
METAL TOTALS	121.7	29.4	15.2	3.7	7.12%	7.24%
PET # 1	23.5	8.1	2.9	1.0	1.37%	2.00%
HDPE # 2	21.7	8.4	2.7	1.1	1.27%	2.07%
Film	56.0	36.0	7.0	4.5	3.27%	8.87%
Other Plastic	148.0	74.0	18.5	9.3	8.65%	18.23%
PLASTIC TOTALS	249.2	126.5	31.2	15.8	14.57%	31.17%
Food Waste	386.5	31.0	48.3	3.9	22.60%	7.64%
Wood Waste	28.0	2.9	3.5	0.4	1.64%	0.71%
Textiles	56.5	17.7	7.1	2.2	3.30%	4.36%
Diapers	79.5	9.2	9.9	1.2	4.65%	2.27%
Other Organics	63.5	13.4	7.9	1.7	3.71%	3.30%
ORGANIC TOTALS	614.0	74.2	76.8	9.3	35.90%	18.28%
Fines	43.0	5.6	5.4	0.7	2.51%	1.38%
Other Inorganics	77.2	4.4	9.7	0.6	4.51%	1.08%
INORGANIC TOTALS	120.2	10.0	15.0	1.3	7.03%	2.46%
GRAND TOTAL	1710.2	405.9	213.8	50.7	100.00%	100.00%

TABLE 9-6

SORT SUMMARY

Seasonal variations

- Clear and brown glass containers were lower during the second sort. The University was in summer session which resulted in less students (presumably consuming beer) in the area.
- Aluminum cans were higher during the third sort. Homecoming weekend was prior to the sort and several bags of “party trash” were sorted.
- Food waste was higher during the second sort due to watermelon rinds and corn shucks.
- Disposable diaper were higher during the first and second sort. During each of these sorts several bags of nursing home waste was sorted with large amounts of adult diapers.
- Fines were higher during the first sort. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

Sort results

- Chart 9-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Maryville.
- The sample data for all Maryville sorts is listed on table 9-7.
- The sort results for all Maryville sorts are listed on table 9-8.
- The summary of statistical relevance for the Maryville sorts is located on page 140.
- The total for all “other wastes” found during the Maryville sorts is on page 140.

All weights are in pounds and volumes are listed in cubic feet.

Comparisons of the Maryville waste stream to previous studies and other communities can be found in chapter 13.

MARYVILLE RESULTS BY WEIGHT

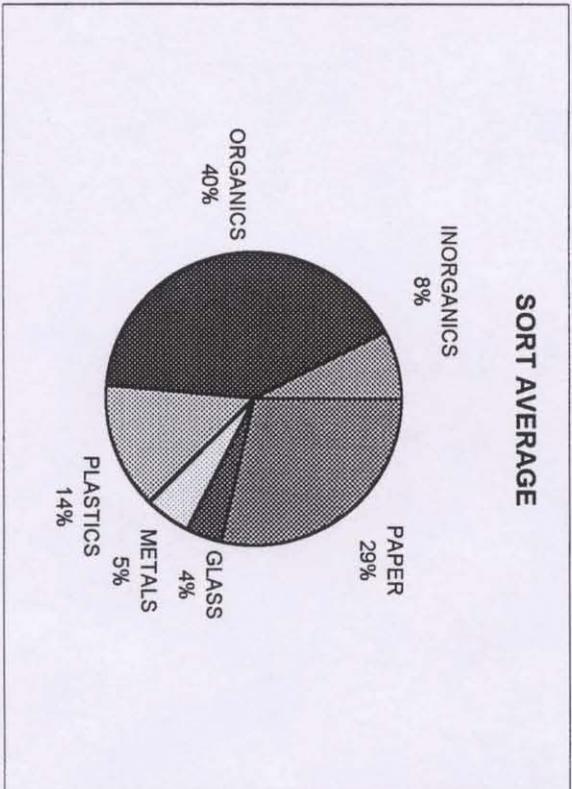
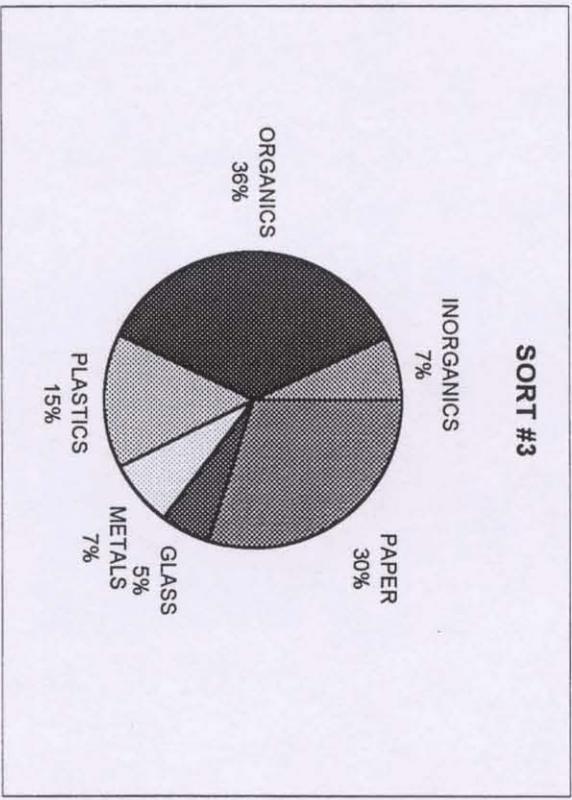
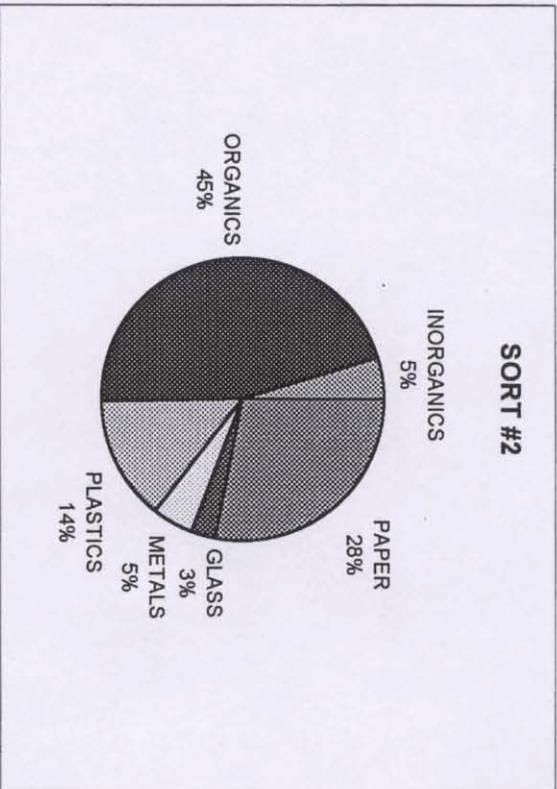
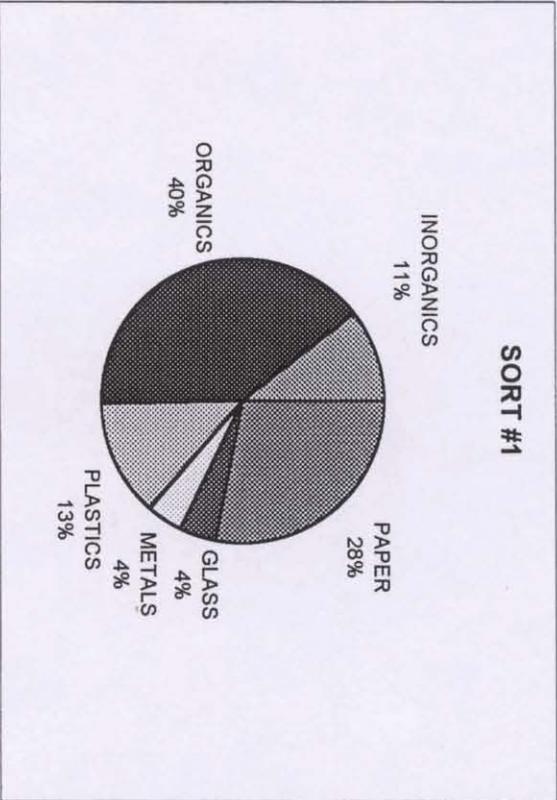


CHART 9-1

**MARYVILLE
SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/18-3/21	14	2839.4	802.0	96%	4%
2	6/24-6-26	12	2816.7	646.2	100%	0%
3	10/21-10/23	8	1712.0	405.9	97%	3%
TOTALS		34.0	7368.1	1854.1	98%	2%
AVERAGE		11.3	2456.0	618.0	98%	2%

TABLE 9-7

CATEGORY	MARYVILLE						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	3.2%	8.0%	5.4%	11.3%	5.2%	10.8%	4.6%	9.8%
Newsprint	3.9%	4.5%	2.4%	1.9%	4.5%	3.9%	3.5%	3.4%
Magazines	1.6%	1.2%	1.5%	0.5%	2.3%	1.1%	1.7%	1.0%
High Grade	1.1%	2.0%	1.2%	0.9%	2.2%	2.7%	1.4%	1.8%
Mixed	18.2%	23.2%	17.4%	20.0%	15.7%	20.3%	17.3%	21.4%
PAPER TOTALS	28.0%	38.9%	28.0%	34.6%	30.0%	38.9%	28.5%	37.4%
Clear	1.8%	0.8%	0.9%	0.4%	2.5%	0.8%	1.6%	0.7%
Brown	1.5%	0.6%	0.7%	0.3%	1.5%	0.7%	1.2%	0.5%
Green	0.1%	0.1%	0.1%	0.0%	0.5%	0.2%	0.2%	0.1%
Other	0.7%	0.7%	1.2%	0.5%	0.9%	0.3%	0.9%	0.5%
GLASS TOTALS	4.2%	2.2%	2.8%	1.1%	5.4%	2.0%	3.9%	1.8%
Alum. Cans	0.5%	0.9%	0.4%	0.3%	1.3%	1.6%	0.6%	0.9%
Other Alum	0.9%	1.7%	1.0%	0.8%	1.6%	2.6%	1.1%	1.6%
Non ferrous	0.4%	0.2%	0.2%	0.1%	0.6%	0.1%	0.3%	0.2%
Food Cans	1.0%	1.0%	1.6%	1.3%	2.7%	2.3%	1.6%	1.4%
Ferrous	1.6%	1.2%	1.4%	1.1%	1.0%	0.6%	1.4%	1.0%
Oil Filters	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%
METAL TOTALS	4.3%	5.1%	4.8%	3.7%	7.1%	7.2%	5.2%	5.1%
PET # 1	0.7%	1.9%	0.7%	1.4%	1.4%	2.0%	0.9%	1.8%
HDPE # 2	1.2%	3.2%	1.3%	2.8%	1.3%	2.1%	1.3%	2.8%
Film	3.2%	8.0%	3.7%	9.0%	3.3%	8.9%	3.4%	8.5%
Other Plastic	8.3%	16.8%	8.3%	16.5%	8.7%	18.2%	8.4%	17.0%
PLASTIC TOTALS	13.3%	29.9%	14.1%	29.7%	14.6%	31.2%	13.9%	30.1%
Food Waste	25.5%	7.4%	27.1%	14.0%	22.6%	7.6%	25.4%	9.8%
Wood Waste	0.6%	0.6%	0.9%	0.6%	1.6%	0.7%	0.9%	0.6%
Textiles	2.2%	2.9%	4.5%	4.2%	3.3%	4.4%	3.3%	3.7%
Diapers	6.6%	4.5%	7.8%	4.1%	4.6%	2.3%	6.6%	3.9%
Other Organics	4.9%	3.3%	5.1%	5.1%	3.7%	3.3%	4.7%	3.9%
ORGANIC TOTALS	39.7%	18.7%	45.5%	28.0%	35.9%	18.3%	41.0%	21.8%
Fines	6.9%	3.7%	3.2%	2.3%	2.5%	1.4%	4.5%	2.7%
Other Inorganics	3.6%	1.6%	1.6%	0.5%	4.5%	1.1%	3.0%	1.1%
INORGANIC TOTALS	10.5%	5.3%	4.7%	2.8%	7.0%	2.5%	7.5%	3.8%
SORT TOTALS	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 9-8

City of Maryville Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	7,386.1
Total Number of Samples Collected	33
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	216.72 (+/-) 15.47

City of Maryville "Other Waste" Summary			
Over-the-Counter Medication (OTC)	23	Beauty/Hygiene Aerosol Products	10
Prescription Medication (Rx)	37	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	45	Gardening/Yard Care Products	1
Household Cleaning Products	5	Pet Groom Products	2
Sharps/Blades	6	Disposable Razors	52
Syringes	196	Alkaline Batteries	106
Hardware/Shop Products	4	Automobile Maintenance/Cleaning Products	7
Aerosol Cans	4		
Miscellaneous items: 1 jar silver cleaner, 3 package of fireworks, 1 fluorescent tube, 1 nebulizer, 13 partial bottles of perm solution, 1 oxygen mask, 2 bullets, 1 thermometer, 1 lighter.			