

DRAFT

Memorandum of Agreement
Report Summary

Statewide
Mandatory Curbside Recycling
Program

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Introduction

Recognizing the need to conserve resources, save landfill space, and promote a conservation ethic throughout the State of Delaware, former Governor Carper signed Executive Order No. 82 on September 14, 2000. The Order created the Governor's Recycling Public Advisory Council (RPAC) and established a goal of diverting 30% of the Residential Solid Waste (RSW) stream. RPAC's primary responsibility is to advise the Department of Natural Resources and Environmental Control (DNREC) and the Delaware Solid Waste Authority (DSWA) on what measures are needed to achieve this goal.

Under the leadership of Governor Ruth Ann Minner, Executive Order No. 82 has stayed in effect and RPAC has continued its efforts to find ways to reach the goal.

Over the past several years, RPAC has been evaluating various possible methods of managing the recyclable portion of the RSW stream. Based on these evaluations, RPAC has come to the following conclusion, which has significance for all Delaware residents: *Achieving the 30% diversion goal will require both curbside recycling of residential recyclables and diversion of yard waste that is currently going into the landfills.*

In response to public and legislative interest in the recycling issue, in January of 2004 RPAC entered into a Memorandum of Agreement (MOA) with DSWA and DNREC to evaluate the feasibility of implementing a statewide mandatory curbside recycling program in Delaware and the costs associated with such a program. The MOA, which is attached to this report, provided for additional assessments to be conducted jointly by the three organizations, culminating in specific recommendations for collecting and processing recyclables (including yard waste), recommendations on how to fund a statewide mandatory curbside program, and draft legislation to implement the recommendations. This report summarizes our recommendations. By December 31, 2004, the final findings, recommendations, and draft legislation will be presented to the Governor and the General Assembly for their consideration.

Today's Situation

Currently, DSWA is responsible for managing the disposal of household waste through its system of landfills and transfer stations. DSWA also operates the voluntary statewide recycling drop-off program and the voluntary subscription curbside recycling program available in New Castle County. Trash collection is conducted by municipalities (incorporated areas) either directly or through a contract with a private hauler, and residents living in unincorporated areas of the state either contract directly with a private hauler for their trash collection service or haul their own waste to a landfill or transfer station. Several of the private trash haulers in New Castle County offer a discount on trash collection to their customers who subscribe to DSWA's curbside recycling service.

This existing drop off system produces a residential recycling rate of about 4 percent. The total municipal recycling rate is about 22 percent. There is room for improvement.

The Proposal

Here are the main components of our proposal:

- All Delaware residents must keep their household recyclables and yard waste separate from their trash.
- The goal will be to achieve a 30% diversion rate for RSW and a 40% diversion rate for Municipal Solid Waste (MSW).
- Trash haulers must provide their customers with curbside recycling collection service either directly or through contract with a recycling collection company.
- Residents who haul their own trash must recycle by using the drop-off centers that will be available at DWSA's landfills and transfer stations. All other drop-off centers will be phased out as curbside recycling is implemented in each county. (The oil recycling, household hazardous waste, and electronic goods programs will continue to exist but may be modified somewhat.)
- The method of recycling will be single-stream collection followed by processing at a Materials Recovery Facility (MRF). This means that all recyclables, with the exception of yard waste, are placed in one container at the curb or at the drop-off site. No separation of individual recyclables is required.
- DSWA will establish a MRF to process the recyclables.
- Residents will be entitled to utilize DSWA's subscription curbside recycling service if they so choose.
- Yard waste must be either managed directly by the homeowner or removed in a collection service separate from household recyclables and trash.

Why Should We Do This? Recycling Has Benefits!

Delaware should recycle more because, in the hierarchy of waste management options, recycling is preferable to disposal. Here are some of the benefits:

- Conservation of non-renewable natural resources
- Conservation of energy
- Extended landfill life
- Reduced long-term landfill liability
- Return of valuable materials to the economic mainstream
- Reduced greenhouse gas emissions
- Promotion of a conservation ethic

An Example: Recycling's Impact on Delaware's Landfills:

A 30% RSW recycling rate will result in an 18% reduction in total tonnage of materials landfilled (based on the estimate that RSW comprises 60% of MSW being landfilled, with commercial and industrial waste comprising the remaining 40%) thereby extending the useful life of these facilities. Table I on the next page shows the impact that a 30% RSW recycling rate would have on each of the state's landfills:

Table I				
Landfill Impacts From 30% RSW Recycling Rate				
	Cherry Island	Sandtown	Jones Crossroads	Statewide
Annual Landfilled Tons	525,000	125,000	200,000	850,000
RSW Portion of Landfilled Tons @ 60%	315,000	75,000	120,000	510,000
RSW Recycled @ 30%	94,500	22,500	36,000	153,000
Net Annual Landfilled Tons	430,500	102,500	164,000	697,000
Net Total Recycled	18%	18%	18%	18%
Current Design Life Expectancy in Years	20*	58	33	28.6
Design Life Expectancy With 30% RSW Recycling	23.6*	68.4	38.9	33.8
Design Life Expectancy With 40% MSW Recycling	28.0*	81.2	46.2	40.1

*Based on DSWA's application to DNREC for expansion of the landfill.

It is important not to lose sight of the fact that while a 30% to 40% recycling rate contributes significantly to landfill space savings, substantial landfill capacity is still needed statewide to manage the remaining MSW. The current total annual tonnage landfilled is approaching 1 million tons per year, so even with a 40% recycling rate, there will still be a need to landfill approximately 600,000 tons per year of MSW.

Recycling Also Has Costs

Just as it costs money to collect and dispose of household trash, it costs money to collect and process recyclables. Sale of the recyclables can help offset the costs, but the market value of the recyclables is not sufficient to cover the cost of collection and processing.

The cost of collecting recyclables depends on a number of factors, including housing density, distance to the processing facility, the collection method, and the frequency of collection. The method of collection that we propose (single stream) is a key component in keeping the collection cost as low as possible.

In Delaware, costs will vary in different areas of the state. We anticipate that the monthly cost will fall within the range of \$3.00 to \$7.00 per household.

These cost estimates were developed by the consulting firm DSM Environmental Services, Inc., which considered two different collection practices. In one system, trash and recyclables are picked up on different days of the week, thus making it possible for the hauler to use the same equipment for both collections. In the second system, trash and recyclables are picked up on the same day, meaning that additional equipment is needed. The first system results in the lower cost, but the second system would probably recover more material. A cost analysis of the two systems shows the following estimated costs per household:

**Summary of Estimated Per-Month Household
Costs for Mandatory Curbside Collection of Recyclables**

County	Private Subscription (\$/month)	Organized Municipal (\$/month)
System 1		
New Castle County	\$3.70	\$3.14
Kent County	\$2.82	\$3.72
Sussex County	\$4.09	\$2.75
System 2		
New Castle County	\$3.88	\$3.62
Kent County	\$6.38	\$4.20
Sussex County	\$7.71	\$3.85

(Note: These costs are in addition to the cost that private haulers charge for trash collection. It is possible that some trash haulers may reduce their customers' trash collection bills, since the customers will be setting out less trash for collection.)

Users of the existing DSWA RECYCLE DELAWARE drop-off program should note that the household cost of using the drop-off program is approximately 85 cents per month. Not included in such amount is the cost of transportation by the user. For the estimated 65% of households that use the drop-off program from time to time, the proposed curbside collection program will provide the convenience of curbside collection of recyclables while significantly increasing the quantity of recyclable materials recovered.

Municipalities that provide trash collection services to their residents or contract for those services can generally estimate the additional costs for the mandatory curbside collection system by multiplying the number of households served by the costs in the above table.

Other than collection costs, the primary cost of the proposed program is for construction and operation of a MRF to process the recyclables collected. We recommend that a dedicated fund be created to cover those MRF costs that exceed the revenue obtained by sale of the recyclables so that there would be no tipping fee at the MRF.

Collection of Recyclables

Selection of a Model:

Our objectives in choosing a recycling model for Delaware were to recommend a program that will:

1. cause the least disruption in the current collection system for homeowners, municipalities and counties, private haulers, and state agencies;
2. afford the most options for municipalities and incorporated areas presently providing or coordinating collection within their boundaries;

3. maximize proper separation, collection, and disposition of recyclable materials from MSW;
4. minimize the cost impact on homeowners, municipalities and incorporated areas, businesses, and state agencies; and
5. allow for maximum use of the private sector to engage in the collection, processing, and marketing of recyclable materials, as required by Delaware law (7 Del. C. 64).

After reviewing and discussing a nationwide survey of mandatory recycling programs and closely scrutinizing three New Jersey programs, we selected three potential models of mandatory curbside recycling for possible applicability and adaptation in Delaware. The following is a brief discussion of each model considered.

1. Pure Districting

This model is a method of collection for jurisdictions implementing mandates. Under this model, Delaware would be divided into districts for collection of all household trash and recyclables. Municipalities, incorporated areas, and the existing Kent County “trash districts” would be able to operate as they do at present, with the added requirement to collect recyclable materials separate from trash, either through their contractors or through DSWA collection. By using a single entity for collection, unincorporated areas would benefit from reduced costs of collection (savings are in the range of \$2 to \$3/month for recyclables) and disposal. On the negative side, the bidding process for single-entity collection could eliminate a significant number of private haulers, who may not be able to compete due to economies of scale and lack of capitalization necessary to fulfill the all-inclusive "district" contracts. Legislation has been introduced in the past to create pure districting in Delaware, but has not passed. For these reasons, this model is not being recommended.

2. Recyclable Material Districting

This model takes advantage of the cost benefits of collection districts while providing less disruption to the current structure for trash collection. Recyclable material collection districts would permit municipalities to collect both MSW and recyclables, collect only MSW and contract with private providers for collection of recyclables, contract with private providers for all waste, or allow DSWA to provide the recyclables collection. Unincorporated areas would have the ability to create districts for collection of recyclables at a reduced cost. Private haulers who wish to enter into the recycling arena would be able to bid on individual districts, while those who lack the ability to engage in the dual collection would be able to continue to compete in the MSW market. There is a risk that smaller private haulers not desiring or able to compete for recyclables collection would eventually be displaced by larger companies that provide complete service for recyclables and trash collection. For this reason, this model is not being recommended.

3. Privatization

This model would place the requirement for collection on municipalities (and individual haulers that contract with municipalities), existing districts, and private homeowners. The cost of the program would be placed on the municipalities,

existing districts, and homeowners. Under this approach, haulers would be required to provide the collection service for recyclables either directly or by contracting with another business to provide the service. Residents would be required to keep recyclables separate from trash and set them out for collection. DSWA would act as a backup curbside collection service provider. This model provides the least disruption to current collection practices, allows the private haulers to use the business model that works best for them, and, most importantly, allows the free market to work and establish the best pricing structure for the consumer through open competition. For these reasons, this model is being recommended.

The “Privatization” model will best achieve the stated objectives in implementing a mandatory curbside collection program. It allows for a single-stream collection system (convenience and low collection costs) and the establishment of a statewide processing facility (MRF) to manage all curbside collected recyclables at no tipping fee. Haulers may deliver recyclables to the MRF or to any other recycling facility they choose.

Materials to be Included in Curbside Collection:

We recommend that these recyclables be collected in the single-stream system:

- Paper (newspaper, phone books, magazines, white office paper, junk mail, corrugated cardboard, and paperboard/boxboard);
- Cans (aluminum and steel); and
- Plastic (narrow-necked bottles).

We recommend that, at least initially, glass be excluded from the mandatory curbside recycling program. Here are the reasons: Glass often breaks during collection, transport, and processing. There is a concern that broken glass will contaminate other recyclables (especially paper), increase wear and tear on equipment, and increase processing costs. In addition, as demonstrated in Tables III and IV on page 10, glass has a very low market value. Glass is an abundant and inert material, has no adverse impact on landfill operations, and arguably is the one recyclable material whose advantages of recycling are outweighed by the disadvantages. Glass is also losing market share as a container.

If conditions change to make glass a more attractive material to recycle, it can be added to the collection system at that time.

Provision for Self Haulers:

People who haul their own trash or who live in areas where curbside trash collection is not available will not be required to recycle at the curb. However, they will still be required to recycle, by means of drop-off centers at DSWA landfills and transfer stations. These drop-off centers will also be single stream; therefore, all homeowners will be able to collect all of their recyclables in one container.

Phase-in Schedule:

The curbside service would be implemented in New Castle County first, expanding to Kent and Sussex Counties one year later.

Separation and Marketing of Recyclables

Our proposed model would require the development of a MRF capable of separating the recyclable materials (collected in a single-stream system) into their individual components and preparing them for market. DSWA will develop such a MRF at its Pigeon Point location in Wilmington. This site has ample space for installation of the necessary processing equipment as well as space to store the recyclables.

DSWA will also provide transfer stations in Kent and Sussex Counties to manage the recyclables collected in those parts of the state.

There will be no tipping fee at the MRF or the transfer stations for recyclable materials delivered to those facilities.

Recyclables in the RSW Stream:

In 2003, on behalf of RPAC, DNREC contracted with DSM Environmental Services, Inc., to estimate the quantities of recyclables that could be recovered using various collection options and the costs of implementing those options. Using waste composition data reported by Franklin Associates in an assessment conducted for DSWA in 2002, and adjusting the data for New Castle County (based on population), DSM generated categories of recyclable materials that would be expected to be collected in a curbside program. Similar data were subsequently obtained for Kent and Sussex Counties using population data from the 2000 census. The results of these assessments are portrayed in Table II on the next page.

DSM reported that a typical curbside collection program would capture, on average, 65% of the available recyclable materials. This figure is based on data from other established curbside programs throughout the country, which show that initially about 80% of the people participate, and they set out about 80% of their available recyclables (the capture rate is calculated by multiplying the participation rate by the percentage of available recyclables that they set out). Factors that influence the capture rate are: whether or not there is a mandate for recycling, the level of education provided regarding the program, and the level of enforcement and penalties imposed for non-compliance. As these programs mature, capture rates increase; and Delaware is expected to experience an increased capture rate as well.

For Delaware, a 65% capture rate will yield an overall RSW recycling rate of about 12.75% as compared with the current drop off system. This represents 65,218 tons of materials collected, which is 3.5 times more material than is currently collected in the voluntary drop-off program (this does not include the material collected in the voluntary curbside subscription service for recyclables currently conducted in New Castle County).

Table II				
RSW Estimated Annual Recyclables Generation by County (in Tons)				
Materials Considered	Generation			
	Curbside Recyclable	Statewide	New Castle	Kent
PAPER				
ONP: News, Mags, Phone Bks	34,210	21,894	5,474	6,842
Junk Mail				
Office Papers	3,050	1,952	488	610
Third Class Mail	9,950	6,368	1,592	1,990
Other Commercial Printing	11,700	7,488	1,872	2,340
Total Junk Mail	24,700	15,808	3,952	4,940
Cardboard				
Boxboard	9,800	6,272	1,568	1,960
Boxboard				
Folding Cartons	9,360	5,990	1,498	1,872
Other Paperboard Packaging	350	224	56	70
Bags and Sacks	4,230	2,707	677	846
Total Boxboard	13,940	8,922	2,230	2,788
TOTAL PAPER	82,650	52,896	13,224	16,530
BOTTLES AND CANS				
Glass Bottles	21,580	13,811	3,453	4,316
Steel Cans	6,460	4,134	1,034	1,292
Aluminum Cans and Foils	3,235	2,070	518	647
Plastic Bottles: PET	3,974	2,543	636	795
Plastic Bottles: HDPE	4,017	2,571	643	803
TOTAL BOTTLES AND CANS	39,266	25,130	6,283	7,853
Total, All Recyclables	121,916	78,026	19,507	24,383
Percent of Available Recyclables	100%	64%	16%	20%
Percent of Total Residential Solid Waste	24%	15%	4%	5%

MRF Economics

Contrary to the views of many, the value of recyclable materials will not support a recycling program. There will be a cost borne by homeowners and businesses for the collection and processing of recyclable materials.

The value of recyclable materials is subject to global controls that impact regional market outlets. Historical pricing has a volatility that creates wide pricing spreads (highs and lows). A review of short-term (18 months) and long-term (44 months) pricing is provided below for the recycled materials that DSWA currently markets. Table III provides the short-term pricing analysis, and Table IV provides the long-term pricing analysis:

	Alum.	Stl Cans	Br. Glass	Gr. Glass	Cl. Glass	Cdbrd.	Plas.	ONP	Off. Ppr.	Jnk MI
Mean	1,000.7	55.6	10.0	0.0	20.0	50.9	102.9	35.3	72.6	38.5
Std. Dev.	46.61	16.24	0.00	0.00	0.00	20.53	23.64	8.08	16.16	3.76
Min.	900	38	10	0	20	10	70	24	60	35
Max.	1100	100	10	0	20	80	150	46	95	45

	Alum.	Stl Cans	Br. Glass	Gr. Glass	Cl. Glass	Cdbrd.	Plas.	ONP	Off. Ppr.	Jnk MI
Mean	967.0	43.2	15.8	2.0	23.4	58.9	85.1	29.0	73.8	38.5
Std. Dev.	67.73	19.95	7.91	2.55	4.47	28.63	32.79	10.60	19.24	3.76
Min.	855	3	10	0	16	10	37	15	25	35
Max.	1100	100	28	5.5	30	118	155	48	110	45

By using the statistical mean for each of the recycled materials for the short-term pricing and applying it to estimated statewide tonnages, a prediction of annual revenues can be derived. Table V provides a projection of the overall revenue that would be realized if 100% of the available recyclables were captured and a projection of the revenue realized if 65% of the available material is captured.

Materials Considered Curbside Recyclable	Short Term Mean Value	Statewide (100%)		Statewide (65%)	
		Tons	Revenue	Tons	Revenue
PAPER					
ONP: News, Mags, Phone Bks	35.3	34,210	\$1,208,753	22,237	\$785,690
Junk Mail					
Office Papers	72.6	3,050	\$221,294	1,983	\$143,841
Third Class Mail	38.5	9,950	\$382,692	6,468	\$248,750
Other Commercial Printing	38.5	11,700	\$450,000	7,605	\$292,500
Total Junk Mail		24,700	\$1,053,987	16,055	\$685,091
Cardboard	50.9	9,800	\$498,711	6,370	\$324,162
Boxboard					
Folding Cartons	38.5	9,360	\$360,000	6,084	\$234,000
Other Paperboard Packaging	38.5	350	\$13,462	228	\$8,750
Bags and Sacks	38.5	4,230	\$162,692	2,750	\$105,750
Total Boxboard		13,940	\$536,154	9,061	\$348,500
TOTAL PAPER		82,650	\$3,297,605	53,723	\$2,143,443
BOTTLES AND CANS					
Glass Bottles	20.0	21,580	\$431,600	14,027	\$280,540

Steel Cans	55.6	6,460	\$359,068	4,199	\$233,394
Aluminum Cans and Foils	1000.7	3,235	\$3,237,311	2,103	\$2,104,252
Plastic Bottles: PET	55.6	3,974	\$220,888	2,583	\$143,577
Plastic Bottles: HDPE	55.6	4,017	\$223,278	2,611	\$145,131
TOTAL BOTTLES AND CANS		39,266	\$4,472,145	25,523	\$2,906,895
Total, All Recyclables		121,916	\$7,769,751	79,245	\$5,050,338

At the anticipated 65% capture rate excluding glass and using recent recyclables values, recyclables revenue is estimated at about \$4,800,000. Taking the cost of statewide transportation of recyclables to the MRF and MRF processing cost into consideration, MRF operations should be nearly covered by the value of the recyclables. As recyclables values fluctuate, the MRF may operate at a loss or a small profit. In the event of a loss additional funding will be needed to cover MRF operational costs.

Funding

Costs for establishing and operating curbside collection programs and processing facilities get passed through to the users by various means, depending upon the program. These costs may be covered by general operating funds, special assessments by state and/or local governments, or contracted costs between private haulers and homeowners.

We recommend that State of Delaware General Funds be made available in the form of grants to municipalities to cover startup costs. These funds would be phased out over a period of time, with the intent that municipalities would be self-sustaining in the future. The funds would be authorized as a one-time appropriation, primarily for equipment startup, with grant approval by DNREC and DSWA. RPAC will continue serve in an advisory capacity regarding municipal grant prioritization and selection, just as they currently do for DNREC's Recycling Assistance Grant Program.

We also recommend that a dedicated fund be established to offset DSWA's costs of operating a MRF when those costs exceed the value of the recyclables processed and marketed. This fund would also cover the costs of outreach and education, recycling studies and planning, and enforcement of the mandatory program. The funds would be collected through a waste-end assessment on all privately collected Solid Waste (excluding recyclable materials) in Delaware on a per-ton basis. Assessments for the fund would be collected by the Delaware Division of Revenue, and the fund would be administered by the Secretary of Finance. The amount of the assessment would be set to cover the costs of the MRF operation, education, studies and planning, and enforcement, and is not expected to exceed \$3 per ton.

Yard Waste Proposal

A recycling rate of 12.75% still leaves us with a considerable challenge if we are to reach the 30% goal of RSW recycling. The difference must be made up by diverting the other major component of RSW: yard waste. We recommend that Delaware adopt a strategy that has proved successful in many states in diverting yard waste from disposal facilities: a ban on the landfilling of yard waste.

By DSM's estimate, instituting such a ban will reduce the amount of material going into our landfills by almost 65,000 tons per year, enabling us to achieve the 30% diversion goal (assuming that the curbside recycling program is also implemented). Approximately 30% of the diverted yard waste would be managed on the property where it originated, through such practices as composting, grasscycling, and mulching. Additional facilities will be needed to handle the remaining material. We recommend that several low- or intermediate-technology facilities be constructed and operated throughout the state to provide localized service. Such new yard waste recycling centers should be located on public property accessible to the public and to collectors when and where the private sector is unable to manage this material. DSWA has agreed to manage the operation of these public sites if no other option is available. The new yard waste recycling centers would not replace existing public and private facilities and would be funded through tipping fees.

The following table shows a pre-ban and post-ban estimate of the yard waste:

Table VI (1)
Annual Delaware Yard Waste Recycling (In Tons)

	Total		Residential (90% of Total)	
	Pre Yard Waste Ban	Post Yard Waste Ban	Pre Yard Waste Ban	Post Yard Waste Ban
Yard Waste mixed w/ MSW & Disposed In DSWA Landfills	95,600	31,000	86,040	27,900
New offsite Yard Waste recycling	0	45,200	0	40,680
New onsite Yard Waste recycling*	0	19,400	0	17,460
Yard Waste diverted, mulched and used at DSWA Landfills	4,500	4,500	4,050	4,050
Yard Waste diverted through Municipal and Private mulching	45,724	45,724	41,152	41,152
Total Yard Waste Generated	145,824	145,824	131,242	131,242
Total Yard Waste recycled	50,224	114,824	45,202	103,342
% of Yard Waste recycled	34%	79%	34%	79%

* Onsite recycling includes homeowner/business use of mulching mowers and on-site composting.

(¹)DSM "Yard Waste Ban" Report, September 15, 2004

The anticipated cost to homeowners who choose to contract for the collection of their yard waste would be in the range of \$3 to \$5 per month.

Other Important Components to Consider

Education

Education is crucial to the success of both the mandatory curbside collection of recyclables and the yard waste landfill ban. We recommend that a joint effort be undertaken to identify what is needed to create an ongoing and successful educational program. Currently, both DSWA and DNREC have educational programs promoting

recycling in Delaware, with DSWA having specific educational outreach programs that promote its statewide drop-off recycling centers and its subscription curbside recyclables collection service. RPAC, DSWA, and DNREC, municipalities, and the private sector need to coordinate efforts to educate and promote the statewide program. Funding for education initiatives would be provided through the waste-end assessment fee. Education will occur through all forms of media as well as cooperative efforts with municipalities and the waste hauling industry.

Enforcement

In addition to operational, logistical, and cost considerations, a successful program requires an effective enforcement mechanism. This mechanism must clearly set forth the requirements and sanctions. Enforcement should be exercised only after:

- 1 the implementation of the education efforts, including notifications and warnings;
- 2 a grace period for compliance; and
- 3 follow-up referral for formal enforcement action in extreme cases

DSWA and DNREC would provide enforcement resources for the mandated recycling program. DSWA would provide the first step effort in identifying compliance problems and using educational means of obtaining compliance. DNREC would receive referrals from DSWA and others to deal with chronic enforcement cases through use of its civil and criminal enforcement authority.

Reporting and Performance Measurement

The performance of the mandatory curbside collection and yard waste recycling programs must be measured against the goals set for the program. The quantity of recyclable materials collected, processed, and marketed must be measured and reported properly if a reasonable estimate of program effectiveness is to be made.

We recommend that an effective measurement system be developed through use of a qualified and experienced consultant.

RPAC will continue to serve in its advisory capacity to DNREC and DSWA to ensure that any specific recycling goals and objectives are being met.

Commercial Sector Recycling

A significant portion of MSW is generated by the commercial sector. Waste characterization studies estimate that Commercial Solid Waste (CSW) comprises about 40% of the MSW generated in Delaware.

We recommend that a 40% recycling goal be established statewide for MSW, which includes RSW and CSW. We further recommend that a detailed study of the commercial waste sector be commissioned by RPAC to estimate the quantities of recyclables generated and recycled by business and industry in Delaware and to recommend measures to achieve the 40% diversion goal. The funding for the study would be provided through the waste-end assessment fee. The commercial sector will be

encouraged to participate in this study.

Conclusions

- Recycling is an important part of waste management.
- A 30% RSW diversion rate is achievable in Delaware, but it will require both curbside recycling and a ban on disposal of yard waste in landfills. Neither strategy alone will accomplish the goal.
- The recommendations in this report have been developed with specific attention being paid to the current waste management situation in Delaware. An attempt has been made to preserve the free market trash collection system and to minimize the program's impact on any sector of the population.
- We anticipate that the monthly cost of curbside collection of recyclables will be in the range of \$3.00 to \$7.00 per household.
- For residents who choose to have their yard waste removed from their property, we anticipate a cost of \$3.00 to \$5.00 per month. Our proposal provides for an education program to teach homeowners how to manage their yard waste at home.
- RPAC, DSWA, and DNREC are committed to expanding recycling throughout the state. In order to do so we will need the support of all Delawareans.

Glossary of Waste Management Terms

Commercial/Industrial Solid Waste means waste generated by stores, offices, restaurants, warehouses, industry and manufacturing.

Composting means the process by which organic material is decomposed to a stable point so that it can be safely used as a soil amendment, conditioner, or additive.

Discards include the solid waste remaining after recycling and composting. These discards are mainly disposed of in landfills or combusted, although some waste is littered, stored, or disposed on site, particularly in rural areas.

Diversion of materials from disposal may be accomplished through source reduction and recycling (including composting). (*Note: this term is synonymous with **waste reduction**.*)

Generation refers to the amount of materials and products that enter the waste stream before recycling (including composting), landfilling, or combustion takes place. (*Note: MSW is considered to have been generated if it is placed at curbside or in a receptacle such as a dumpster for pickup, or if it is taken by the generator to another site for recycling or disposal.*)

Grasscycling means using a mulching mower (or not) and leaving the grass clippings on the lawn. Grass clippings quickly decompose and add organic content and nutrients to the soil.

Landfill Avoidance refers to those activities (i.e., resource recovery and combustion) that reduce the amount of waste generated that ultimately gets landfilled.

Materials Recovery Facility (MRF) means a facility in which recyclable and reusable materials are recovered, by either hand sorting, mechanical processing, or a combination thereof.

Municipal Solid Waste (MSW) includes durable goods (excluding vehicles and other moving equipment), nondurable goods, containers and packaging, food scraps, yard trimmings and miscellaneous inorganic waste from residential (single- and multi-family households) and non-residential (commercial, institutional and industrial) sources. MSW does not include construction and demolition debris, vehicle bodies, municipal sludges, combustion ash, industrial process wastes, and trees and brush from parks, streets or power line trimmings that might also be disposed in municipal solid waste landfills

Recovery of materials means removing certain materials/products from the waste stream for the purpose of recycling (including composting).

Recyclable materials refers to the portion of the waste stream that can be separated from the waste stream and managed through the process of recycling.

Recycling refers to materials that would otherwise be discarded and includes any of the activities necessary for a recovered material to be used in a new product. Recycling involves any and all of the following steps: separating, collection, processing, market or free distribution, remanufacturing (if done), and purchase/use by a consumer. Excludes the use of these materials as a fuel substitute or for energy production.

Residential solid waste (RSW) consists of wastes that fall within the following categories and that are generated by the residential sector (single- and multi-family dwellings).

Durable goods

Major appliances
Furniture and furnishings
Small appliances and carpets and rugs
Rubber tires
Lead-acid batteries
Miscellaneous durables
(e.g., consumer electronics, luggage, sporting equipment)

Containers and Packaging

Glass packaging
Metal packaging
Paper and paperboard packaging
Plastics packaging
Wood packaging
Other miscellaneous packaging

Nondurable goods

Old newspapers
Old magazines
Office papers
Disposable diapers
Clothing and footwear
Other nondurable goods (e.g., books, junk mail, tissue paper and paper towels, paper and plastic plates and cups, other nonpackaging paper, trash bags, sheets, and towels)

Other Wastes

Food waste
Yard trimmings
Miscellaneous inorganic wastes

Resource Recovery means removing certain materials/products from the waste stream for the purpose of recycling (including composting), reuse, or energy production.

Reuse refers to the use of a product or component of MSW in its original form more than once. Examples include refilling glass or plastic bottles, using corrugated or plastic containers for storage, and returning milk crates.

Source reduction refers to those activities that reduce the amount or toxicity of wastes that enter the municipal solid waste management system. Reuse of products such as refillable glass bottles, reusable plastic food storage containers, or refurbished wood pallets are examples of source reduction. Management of yard trimmings at home is another example of source reduction.

Tipping fee – a fee charged by a waste management facility, usually on a per ton basis, to accept a given waste (trash, recyclables, yard waste) for processing or disposal.

Acronyms

CSW – Commercial Solid Waste

DNREC – Department of Natural Resources and Environmental Control

DSWA – Delaware Solid Waste Authority

MOA – Memorandum of Agreement

MRF – Materials Recovery Facility

MSW – Municipal Solid Waste

RPAC – Recycling Public Advisory Council

RSW – Residential Solid Waste