

Montgomery County Solid Waste Management
A Review

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Montgomery County Solid Waste Management - A Review

Introduction

Montgomery County residents and businesses currently pay for disposal of more than 1.1 million tons of solid wastes per year. About 25% of the total is disposed of privately by export to out-of-county facilities or in local, privately operated facilities and 75% is disposed of through County government disposal systems. While County contractual costs for transporting waste to, and depositing it in, a landfill were less than \$36/ton in FY2002, *system disposal costs averaged more than \$107/ton - three times the landfill contract cost.*

This study examines the structure and financing of the Montgomery County government solid waste management system. First, a broad profile of the waste streams disposed of through government systems, and their respective costs, is presented. Second, policy decisions taken by elected County officials that lead to those costs are identified and discussed. Third, property assessments and fees applied by the County to finance the system are evaluated and compared with fees/levies applied elsewhere in the region. The final section evaluates and summarizes the major points presented earlier, showing that alternative arrangements for pricing of disposal services; and for processing and disposing of some or all solid wastes is advisable.

Waste Streams and Costs

837,083 tons of solid waste were delivered to the County's waste management system in FY2003. (Abandoned vehicles and medical and hazardous wastes are disposed of through other channels.) Recyclable yard wastes made up about 9% of the waste stream, other recyclables about 11% (total recycle about 20%), nonprocessable materials deposited directly in landfill comprised 8%, and the remaining 72% was "disposed of" by incineration at the Resource Recovery Facility (RRF) in Dickerson, MD. Incineration, though, is an intermediate process that reduces waste tonnage and volume but generates residual ash which is landfilled. Thus, while receiving 837,083 tons of solid waste for disposal, Montgomery County's Division of Solid Waste Services paid for disposal of 1,014,117 tons.

FY2002 county "disposal" expenditures totaled \$87.5 million for processing 803,631 tons of waste delivered to county facilities while realizing revenues of \$1.5 million from recycled materials sales. Net cost per ton of waste delivered amounted to \$107.18. Based first half FY2003 experience, county staff expected receipt of 837,083 tons with disposal expenditures of \$87.6 million and recycling receipts of \$1.7 million for a net cost of \$102.60 per ton of waste received. (See Table 1.) Budget data and waste volume projections for FY2004 projected net costs of \$112.84 per ton due in part to an expected decline in waste volumes in response to an increase in waste "tipping fees" or charges. (This expected decline in waste volume did not materialize.)

1 Nonprocessable wastes are wastes that cannot be processed at the County's RRF or its Recycling Center such as rock fragments, soil, masonry, concrete, etc. because of bulkiness, composition or regulatory restrictions.

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Evaluating disposition costs by disposal method (incineration, recycling, landfill only) requires consideration of overhead costs incurred in an integrated, multi-waste stream operation as well as direct contractual outlays. Including overhead expenses, the average cost per ton for landfilling refuse over FY2002-2004 is estimated as \$44.22 versus direct contract cost of \$35.82, for example. In comparison, average recycling cost over the same period is estimated as \$139.29/ton while cost of incineration plus landfill of residual ash is estimated at \$105.58/ton. *These wide cost disparities between methods of disposal raise a number of issues.*

Table 1
Department of Public Works and Transportation, Division Of Solid Waste Services Selected Solid Waste Disposal Expenditures and Revenues

	Estimated FY2002	Estimated FY2003	Budget FY2004
	On U.S. Dollars)		
Expenditures - Total	87,492,990	87,596,180	90,184,508
Of Which			
Incineration (RRF)	52,442,183	53,753,100	54,214,442
Landfill Operations	10,117,860	10,727,992	10,391,290
Recycling Operations	24,932,947	23,115,088	25,578,776
Less Revenues From Recycling	1,358,889	1,708,530	1,901,990
Net Public Costs	86,134,101	85,887,650	88,282,518
	(in tons)		
Tons Delivered to County	803,631	837,083	782,377
Tons Disposed by County	974,421	1,014,117	947,613
Sent to RRF	575,312	600,117	560,121
RRF Ash to Brunswick	170,790	177,034	165,236
Nonprocessible waste to Landfill	66,119	67,132	60,639
Material Processed For Recycling	162,200	169,834	161,617
	On US. Dollars)		
Average Net Costs Per Ton			
Delivered to County	107.18	102.60	112.84
Disposed of by County	88.40	84.69	93.16
RRF & Operation	91.15	89.57	96.79
Incineration Plus Landfill of Ash	103.83	102.53	110.36
Landfill of Nonprocessible waste	42.71	43.94	46.00
Recycling Operations	145.34	126.04	146.50
Material disposition		41.03	44.91
Recycle collections		85.01	101.59

Comparability of Costs

Cost estimates presented in Table 1 show cash outlays by the county's Division of Solid Waste Services for each disposal activity and related programs by fiscal year. Thus, the estimates include a mix of current operating costs, capital expenditures, payment of past accrued liabilities, and debt service payments due. (Future obligations and commitments are not reflected.) Capital expenditures, such as purchases of front end loaders, provide service

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over multi-year periods and occur periodically to replace equipment or to accommodate growth. Use of three year average values for each disposal method smooths some of the lumpiness in capital expenditures and limits the upward bias that could arise in focusing on a single year. Available information, though, clearly supports ranking disposal methods by costs and assessing cost difference orders of magnitude.

The cost of current landfill operations is fully captured by contract pricing for tonnage landfilled plus a share of management overhead. However, landfill expenditures by the Division of Solid Waste Services include continuing costs for two closed, in-county landfills (Gude and the Oaks Landfills) and one (Site 2) in-county location acquired for future landfill use. [Federal regulations require operators to monitor environmental conditions around closed landfills for 30 years from date of closure.] Thus, the landfill cost of \$44.22/ton presented earlier overstates current costs of disposal in landfill facilities by roughly 18%. Actual current costs are about \$36.26/ton.

Incineration of solid waste at the RRF is a partial substitute for landfilling. It converts waste mass to energy, leaving 30% of the tonnage for disposal while waste volume is reduced by about 85%. Residual ash can be disposed of by recycling or by landfill, but attempts to recycle the ash have proven more costly than landfilling and unable to reliably absorb substantial ash volume. Moreover, the County Council declined to credit recycled ash toward their 50% recycling goal. Currently, disposal of residual ash is by out-of-county landfill under the same contract and at the same cost as that for other waste. Landfill charges for this residual ash account for \$13.07 per ton of waste incinerated (a cost that could be avoided or reduced by development and use of the county owned Site 2 landfill location). Transporting waste to the RRF costs another \$12 - \$13 per ton. The remaining \$80 per ton cost for disposal through the RRF is comprised of overhead expenses, equipment purchases (including Transfer Station needs), environmental monitoring, and debt service on funds borrowed to finance construction of the RRF and Transfer Station. Debt service is by far the largest cost element, amounting to \$58 for each ton of waste incinerated in FY2003.

Disposal by recycling requires separation of recyclable materials from other refuse, either at point of collection or at a waste sorting facility. Initial sorting at point of collection increases both the proportion of wastes recycled and the cost of recycling. Montgomery County's waste management system applies both techniques. To implement or expand recycling, three separate collection systems were added to standard refuse collection - seasonal vacuum leaf collection (in parts of the County), weekly collection of mixed paper and other mixed recyclables, and weekly collection of yard waste. Collected mixed paper bundles and nonpaper collectibles are then sorted at centralized facilities. Specialized collection systems account for 63% of the \$139.29/ton estimated recycling costs or about \$87.75/ton with management overhead and centralized sorting costs of \$42.97 ton.

Waste Trends and Cost Reduction Potential

Prevailing solid waste trends in the county suggest higher future waste volumes and costs per ton absent significant change in county policies. While annual population and employment

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growth averaged 1.5% and 2.6%, respectively, growth in waste tonnage delivered to the county's waste management system averaged 7.1% from FY1998 (593,512 tons) through FY2003 (837,083 tons). This rapid growth in county systems waste processing has largely absorbed available facilities capacity, particularly at the Transfer Station and RRF.

General composition trends are shown in the waste stream shares presented in Table 2. These shares total more than 100 percent, reflecting incineration of part of the waste mix (71 % - 73.5%) at the (RRF). Shares presented for nonprocessible waste landfilled, yard waste recycled, other recyclables, and refuse sent to the RRF total 100 percent of the tonnage delivered to County solid waste facilities. Ash remaining from material incinerated accounts for the percentage totals above 100.

Table 2. Montgomery County Solid Waste Management System: Waste Shares (in Percent)
Nonprocessible

Year	County Syste	Landfilled Waste	Recycled Yard Waste	Other Wastes	Recycled Wastes	Refuse Sent To RRF=	RRF Ash 1.
1998	120.44	5.45	10.04	11.07	73.44	20.44	
1999	120.02	6.12	10.50	9.99	73.39	20.02	
2000	119.87	7.33	9.76	11.65	71.33	19.87	
2001	119.68	7.13	9.87	11.91	71.08	19.68	
2002	121.25	8.23	8.80	11.38	71.59	21.25	
2003e	121.15	8.02	9.20	11.09	71.69	21.15	
2004e	121.12	7.75	9.93	10.73	71.60	21.12	

The share of waste incinerated declined from FY1998 (73.4%) through FY2003 (71.7%) despite a 38% increase in volume over the period. With waste volumes dispatched for incineration growing at an average annual rate of 6.6% over the time frame, however, boiler capacity utilization of the RRF rose from 67.1% in FY 1998 to 92.7% by January, 2003. Continuing growth in the "processible" waste stream that is currently incinerated will require expansion of RRF incineration capacity or landfilling volumes in excess of existing capacity.

The Transfer Station in Rockville, originally designed to receive up to 2,400 tons per day (TPD), has been used to handle more than 3,000 TPD. By FY2002, transport of waste to the RRF in Dickerson was nearing capacity constraints on peak volume days, prompting the RRF operating contractor to expand waste container capacity by 25%. County installation of a fourth compactor is programmed for FY2004 to assure availability of capacity to prepare waste for shipment to the RRF.

Maintenance of existing incineration capacity itself will require continuing investment in the RRF. Each of the three boilers in operation are taken off line twice yearly for scheduled maintenance and normal industry practice entails major maintenance service on the steam turbine-generator at approximately seven year intervals. Shipping containers used to transport waste to the RRF are on a ten year replacement cycle. Thus, there is little reason to expect any decline in operating cost per ton of waste. However, rising world oil and gas prices plus expiration of electricity rate tariff caps over the next few years can be expected to result in rising electricity sales revenues- Net RRF operating costs for current waste

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incineration volumes therefore have the potential to decline slightly from FY2004 onward. Additionally, continuing population and employment growth with associated real estate development offers the potential for modest reduction in refuse costs per property owner by spreading the costs of RRF financing bonds across a larger number of property owners. Continuation of existing waste management policy, however, would obviate any potential decline in property owner contributions to RRF financing since additions to RRF capacity would be needed to incinerate additional wastes generated in/on newly developed properties. *Any significant decline in taxpayer funded outlays per ton of waste incinerated cannot be expected prior to retirement of debt incurred to finance construction of the RRF:*

According to an independent engineering evaluation completed in FY2003, adherence to industry standard maintenance practices at the Transfer Station and the RRF should preserve the useful lives of these facilities beyond the current final maturity date (2016) of all outstanding bonds issued to finance and/or refund them. Debt service obligations on RRF bonds will rise sharply in FY2009, jumping from \$33.2 million to \$46.5 million, and then fall back to \$31.5 million. Assuming the decision is taken to landfill "processable" waste volumes in excess of existing RRF capacity, debt service obligations per ton of waste incinerated will decline slightly after FY2009 until FY2015 when debt service declines to \$20 million. In FY2016, debt service per ton will jump sharply due to a debt service obligation of \$57.4 million. Meeting this sharp, 187% increase in debt service obligation in 2016 will require a pronounced one year increase in solid waste fees, paying higher solid waste fees into a sinking fund for a number of years leading up to 2016, or stretching out the maturity schedule by refinancing some of the amount due in 2016. (Stretching out the payment schedule would extend Montgomery County's contract with the Northeast Maryland Waste Disposal Authority by the same amount of time.)

Despite considerable emphasis by County officials on recycling, the recycled share of waste processed through county systems actually declined slightly between 1998 (21.11%) and 2002 (20.18%) and 2003 (20.29%)_ This relative stability of recycling in waste shares indicates that waste volumes recycled grew nearly as fast as total tonnage delivered to county systems. (Note: Total recycling of county waste, including materials recycled at private facilities, raise the aggregate share of county waste recycled to the range of 35- 37%. About 12% of county waste is processed through private recycling facilities and county staff estimates that 60% of all yard waste is recycled at private residences through backyard composting or other means.)

A rising share of nonprocessable waste in the total waste processed by county systems since FY1998 has served to constrain growth in overall system costs as these wastes are generally landfilled. Nonprocessable waste sent directly to landfill facilities increased from less than six percent to more than eight percent of total county system volume. This waste stream, largely comprised of construction and land development debris, more than doubled in volume from 32,364. to 67,132 tons, reflecting growth averaging more than 16% per year.

Waste Management Policy Decisions of Elected Officials

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The breadth and depth of solid waste collection and disposal activities is determined by local legislation subject to compliance with minimum standards established by State and Federal statutory and regulatory mandates. Maryland statutes and regulations require political subdivisions of the State to recycle at least 20% of waste generated in their jurisdictions. It also requires development of solid waste management plans covering a ten year planning horizon and to provide periodic updates. Montgomery's *Comprehensive Solid Waste Management Plan for the Years 1998 through 2007* (the Plan) was approved by the County Council on October 6, 1998, building upon and extending earlier decisions taken to build the Resource Recovery Facility.

The Plan purports to specify a priority order of use for four solid waste disposal approaches - waste reduction is preferred, followed by recycling, then incineration with energy recovery, and finally landfilling. The Division of Solid Waste Services, Department of Public Works and Transportation, is tasked with planning fulfillment of county obligations regarding solid waste and with most operational responsibilities. However, the Department of Environmental Protection is responsible for disposal of hazardous, medical, and pathological wastes while the Police Department deals with collection and disposal of abandoned vehicles and dead animals. (Apart from inclusion in total county waste volumes and this paragraph, waste management activities and costs of the Police and Environmental Protection Departments are not addressed further in this report.)

In addition to claiming a priority ranking for disposal methods, the Plan reflects a County Council directive to recycle 50% of county waste by FY2000 (an unfulfilled mandate). Administrative procedures for estimating growth in waste volumes and for calculating waste management charges assessed against property owners are either directed or sanctioned. This level of micromanagement is a major contributing factor both to high waste disposal and recycling costs borne by taxpayers and to growth in waste volumes at rates substantially greater than growth in population.

Table 3 presents an historical picture of the pricing of Montgomery County's solid waste systems services using the county's terminology. In addition to the nominal dollar property assessments and disposal fees (units presented on property tax bills and account statements) proposed by the County Executive and approved by the County Council, the prices are also stated in constant, year-end 1998 dollars (dollar values adjusted to remove inflation) to show how solid waste charges have changed relative to the prices of other consumer goods and services over time. (Underlying detail necessary to fully show developments in assessments on non-residential property owners was not readily available. Such properties are assigned one of five different pairs of "Base System Benefits Charge" and "Incremental Systems Benefit Charge rates based on property use and presumed "waste generation category.")

County property assessments distinguish between four broad "classes" of property owners -single family, multi-family, incorporated municipality (single family), and non-residential.

All properties are assessed a "Base System Benefit Charge" related to management

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Table 3. Solid Waste Charge (Rates by Type of Taxable Unit and Assessment

Service Category	1998	1999	2000	2001	2002	2003	2004
	(\$ per dwelling unit)						
Single Family Assessments							
Solid Waste Disposal Fee	50.71	49.44	44.83	39.77	32.69	40.34	45.47
Base System Benefit Charge	93.66	98.04	86.23	75.86	61.31	65.21	50.92
Incrh System Benefit	61.83	57.71	76.90	76.25	76.47	64.92	80.31
Total Single Family	206.20	205.19	207.96	191.88	170.47	170.47	176.70
Mufl-Family Assessments							
Base System Benefit Charge	57.04	47.47	50.55	38.59	39.58	25.19	27.60
Incr!) System Benefit	1.88	2.11	7.05	5.26	4.16	16.10	9.05
Total Mufl-Family	58.92	51.58	57.60	43.85	43.74	41.29	36.65
Incorporated Municipality Base System Benefit Charge	93.66	98.04	86.23	75.86	61.31	65.21	NA
Non-Residential Assessments	250.68	287.63	316.86	284.28	283.39	275.95	NA
	(Average f Per 2AW sluam feet)						
	(\$ per tun)						
Tipping Fee	44	44	44	44	44	44	48
SF Disposal Fee	1.15	1.12	1.02	0.9	0.74	0.92	0.95
	(Consumer Price Index values)						
CPW Index Values - yearend	161.3	163.9	168.3	174	176.7	180.9	184.3
Inflation deflator	1.000	0.984	0.958	0.927	0.913	0.892	0.875
	(System Charges in December 1998 Dollars)						
Total Single Family	206.20	201.94	199.31	177.87	155.61	152.00	154.65
Total Mufl-Family	58.92	50.76	55.20	40.65	39.93	36.82	32.08
Municipality System Benefit	93.66	96.48	82.64	70.32	55.97	58.14	NA
Non-Residential Charges	250.68	283.07	303.68	263.53	258.69	246.05	NA
Tipping Fee	44.00	43.30	42.17	40.79	40.17	39.23	42.01
	(Constant 0W t Fees Relative to FY1998)						
Total Single Family		97.9%	96.7%	86.3%	75.5%	73.7%	75.0%
Total Mufl-Family		86.2%	93.7%	69.0%	67.8%	62.5%	54.4%
Municipality System Benefit		103.0%	88.2%	75.1%	59.8%	62.1%	NA
Non-Residential Charges		112.9%	121.1%	105.1%	103.2%	98.2%	NA
Tipping Fee		98.4%	95.8%	92.7%	91.3%	89.2%	95.5%

Sources: CPI-U, U.S. Bureau of Labor Statistics; March 25, 2003 Bond Offering Statement

overhead expenses and long-term capital costs of the Transfer Station and the RRF. As annual long-term capital costs of the RRF and Transfer Station are relatively fixed, this cost element has declined steadily as excess R1tF capacity enabled absorption of waste from additional real estate development and spreading of costs over a larger number of properties. Owners of properties outside of incorporated municipalities also pay "incremental system benefit charges" for recycling programs - a category of "services" that differ by type of property. (Some incorporated municipalities operate independent recycling programs and properties

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A tipping fee per ton of waste collected and delivered to the Transfer Station is charged (or assessed) for non-recyclable wastes. The tipping fee - described as market-based in relation to tipping fees in nearby jurisdictions -- takes one of two forms. Refuse haulers serving nonresidential and multi-family properties are charged for each ton of waste delivered to the Transfer Station. **In lieu of charging collectors of refuse from single family residences for refuse tonnage delivered, all single family properties are assumed to generate *the sane volume of waste in a given year and charged the tipping fee for that waste volume*** regardless of home size, number of people resident on the property, or mixed use of the property for business as well as residence. The assessed single family dwelling tipping fee is included on the annual property tax bill.

The single family property disposal fee assessed for FY2004, for instance, assumes that residents of each single family dwelling would generate 0.947 tons of solid waste, up from 0.917 in FY2003. The ratios of single family disposal fee to tipping fee presented in Table 3 reveals significant variation in the assumed annual single family waste volume over time. This ratio ranged from a high of 1.15 in FY 1998 (implying 1.15 tons of waste per single family dwelling) to a low of 0.74 in FY2002. (An ad hoc survey of private haulers serving several thousand single family residences suggests that actual average generation of nonrecyclable waste per household is closer to 0.5 tons/year.)

Except for materials collected under residential recycling contracts with Montgomery County, tipping fees are also charged for recyclable containers delivered to county facilities. No charge is assessed for paper delivered to the paper acceptance facility. A tipping fee of \$15/ton is charged for recyclable containers delivered to the Transfer Station by municipalities, and \$29/ton is charged for yard trim delivered to the Transfer Station by commercial haulers and municipalities.

Adjusted for inflation, these assessments and charges declined steadily in real purchasing power terms from 1998 through 2003 for all residential properties but at different rates (charges in earlier years were not reviewed). Measured in dollars of end-1998 purchasing power, solid waste charges assessed on multi-family properties declined dramatically (37.5%) as charges assessed on single family properties dropped significantly (26.3%). For non-residential properties as a group, FY2004 assessments are almost unchanged (down 1.8%) from FY1998 after jumping sharply (12.9%) in FY1999 and again (8.2%) in FY2000 and declining gradually thereafter.

The reference above to "non-residential properties as a group" is notable. Non-residential "Base System Benefit Charge" rates for FY2004 range from a low of \$58.83 per 2,000 square foot unit of enclosed area to high of \$529.45 per unit while "Incremental Systems Benefit Charge" rates range from \$8.63 to \$77.67 per unit.

The "tipping fee", or volume charge for waste delivered to the Transfer Station, remained constant in nominal terms at \$44/ton through FY2003 before being raised to \$48/ton for FY2004. Thus, the real short-term "variable" cost to residential property owners of waste

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disposal declined steadily after FY1998, dropping 10.8% by FY2003. Despite the \$4/ton price increase in FY2004, the "tipping fee" remains 4.5% below FY1998's real price.

Inter jurisdictional Comparison of Waste Management Fees

Costs to homeowners and others to dispose of these wastes differed within the County and from costs incurred by residents of other area jurisdictions. Complete data on refuse disposal costs of commercial entities in Montgomery, or for other jurisdictions, is not readily available. However, assessments levied by local governments on single family residential property owners provide a basis for some comparative analysis.

Two large area jurisdictions - Baltimore County and the District of Columbia - forego separate billing of solid waste management costs on property tax bills, paying these costs out of general tax revenue. Howard, Fairfax, and Loudoun counties assessed property owners a charge of \$125 in FY 2003. Anne Arundel charged property owners \$234 while Prince George's property owners were assessed \$299 for twice weekly refuse pick ups. Montgomery County assessed single family' residential property owners \$170.47 in solid waste charges independent of refuse collection costs'; refuse collection once per week under County managed refuse collection contracts added \$66 to homeowner expenses for a total of \$236. Residential property owners elsewhere in the County paid the County the same \$170.47 in property assessments plus a collection fee to private contractors. Twice weekly refuse collection typically cost \$180 - \$216 giving total solid waste costs of \$350 - \$386.

Thus, for comparable service, Montgomery County homeowners, if not other residents, pay the highest charges in the region for solid waste management services. Montgomery homeowners receive little in return for the higher charges. Year round yard waste recycling service is provided and residents may deliver up to 500 pounds of trash and/or recyclables from their homes to the Transfer Station without charge as often as the homeowner wishes. Most other area jurisdictions limit yard waste collection services to 39 - 42 weeks per year and some require their homeowners to purchase permits for direct delivery of wastes to landfill facilities. Howard County, for instance, charges homeowners \$12 per year for supplemental landfilling permits.

System Evaluation

The county's waste management system utilizes a highly centralized system structure which appears to seek to exploit economies of scale and to maximize administrative efficiency. This structure has successfully disposed of an unrelenting river of solid wastes generated by county residents and businesses. It has done so, however, at some cost of equity between taxpayers, at extraordinary expense, and with pricing that is disadvantageous to homeowners, facilitates growth in waste volumes, fundamentally violates "the polluter pays" principle and is in some cases erroneously labeled as "service" charges instead of taxes. Alternative

**2 In Montgomery County, buildings comVised of six or fewer units. 3
Solid waste charges include costs of collecting recyclable materials.**

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arrangements for pricing of disposal services, and for processing and disposing of some or all solid wastes are advisable.

Equity Among Taxpayers

Montgomery County's waste management system ensures differential levels and costs of service to different types of property and locations within the county. Properties located near the Transfer Station are better served than those at greater distances to the centralized facilities. Greater distances and longer travel times mean higher costs for contracted refuse removal services; they also act to restrict homeowner access to the entitlement to dispose of up to 500 pounds of refuse and/or yard waste without charge. Homeowners are compelled to pay for expensive recycling collection and other county government recycling "services" while owners of other property types are not. Homeowners are assumed to dispose of much more waste than they generate resulting in an excessive tipping or "disposal fee" charge, effectively subsidizing owners of other types of property.

Pricing of County Waste Management Services

Governmental administrative decisions determine the production methods and quantities of solid waste services supplied by Montgomery County's waste management system rather than market decision makers responding to price signals. Prices have been set administratively to promote a number of governmental and social objectives, including minimization of administrative costs for enforcement of county regulations on waste disposal. Setting the tipping fee at a level competitive with charges in nearby jurisdictions uses a market incentive to encourage businesses and multi-family property owners to use county disposal services rather than taking the material elsewhere. This approach supports administrative efficiency through minimization of regulatory costs for all area jurisdictions.

The cost/price of refuse removal from the perspective of commercial enterprises is what they must pay refuse removal companies for their services, a cost that directly reflects fees paid for refuse tonnage delivered to county facilities. As nearby jurisdictions only landfill their solid wastes, Montgomery's tipping fee pricing regime has effectively set those fees to cover the only landfill disposal. (This reality is verified by Montgomery County's own three year average cost of \$44.22/ton for landfill disposal.) However, the county's actual cost of solid waste disposal averaged more than \$107/ton due to RRF incineration and recycling with the long-term costs for those facilities shielded from market view through multi-level pricing and financed through a tax on real property. Consequently, the Montgomery County's pricing policies for solid waste services to commercial interests (non-residential and multi-family property owners) fail to support the declared top two Council priorities for waste management and disposal - waste reduction and recycling.

While County sources report that half of the waste processed by the county originates with businesses, a number of sources suggest otherwise. Waste volume trends presented in Table 2 show growth averaging 7.1% since FY1998 when population growth averaged an

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estimated 1.5% and employment growth averaged 2.6% - nearly 75% faster than population. That is, business agents and activity grew far faster than single family (69.2%) and multifamily (30.8%) households. Average growth of more than 16% annually that has raised the share of nonprocessible wastes (primarily construction and land clearing debris) to more than 8% of total volume supports a large and rising business share.

Within the aggregate waste stream, recycled materials actually declined slightly. Assuming single family household wastes recycle roughly half of their wastes while multi-family and non-residential generators do not (a further county claim), the decline in share recycled implies slower growth in refuse streams generated by the single family homes than by multifamily and non-residential properties. The author's ad hoc survey of refuse collectors serving single family homes suggests refuse generation of near 0.5 tons per residence as opposed to 0.947 tons per home billed at the FY2004 tipping fee rate of \$48/ton.

Table 4
Property Type Shares in Projected FY2004 Solid Waste Service Charge Revenues
Single Family Multifamily Non-residential Totals

Base System Benefit Charges	13.8%	3.3%	16.7%	33.8%
Incremental Systems Charges	18.6%	1.1%	2.4%	22.1%
Disposal & Tipping Fees #	10.6%		21.6%	32.2%
Special Service Area Fees	11.7%	0.3%	0.0%	12.0%
Totals: All charge types	54.70%	4.70%	40.70%	100.10%
Trials: county-wide services	43.00%	4.40%	40.70%	88.10%
Property Type shares of Charge Categories				
Base System Benefit Charges	40.8%	9.8%	49.4%	100.0%
Incremental Systems Charges	84.2%	5.0%	10.9%	100.0%
Disposal & Tipping Fees #	32.9%	0.0%	67.1%	100.0%
Special Service Area Fees	97.5%	2.5%	0.0%	100.0%

Source: Department of Public Works and Transportation, Division of Solid Waste Services #
Tipping fees paid by collectors of refuse from multifamily properties are lumped with Tipping fees paid by collectors serving non-residential properties.

Against the statistical record, the distribution of solid waste charge shares paid by property owners shown in Table 4 is instructive. As groups, single family property owners were assessed 41% of FY2004 "Base System Benefit Charges" while multi-family property owners were billed for 10% of the total and non-residential property owners were billed for 50%. Residents of single family homes account for 78% of the county population with the remaining 22% residing in multi-family units. Even accepting the county's reported 50% share of non-residential waste, the single family property shares of Base System Benefit Charges and Tipping Fees is disproportionately large.

Extraordinary Expense

As shown in Table 1, estimated average costs for incineration of waste plus landfill of the residual ash over the three fiscal years FY2002-FY2004 are nearly \$106/ton as recycling

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costs averaged \$139/ton. Direct landfill of these wastes would have cost \$44.22/ton.

Construction (or expansion) of the RRF can not be defended on economic grounds. At the time of the initial decision to proceed with construction, recovery of projected costs of development and operation of the facility indicated that break even on the project within a reasonable period would *depend on an unrealistic level of future energy prices* - a level consistent with oil prices near \$100/barrel. Given a decision to build, the adverse economic circumstances were compounded by locating the facility in a remote area, necessitating continuous, needless millions of dollars in transportation expenses. Further, off budget RRF project financing through revenue bonds increases borrowing costs *while it evaded the 1990 County Charter amendment limiting annual increases in property taxes* under transparent mislabeling of "Base System Benefit Charges" as a "service" fee- (Higher borrowing costs arise through higher transactions costs as well as higher interest rates.)

Costs of \$139/ton (the short-term marginal cost of recycling) are imposed on single family property owners in unincorporated areas of the county, but not upon other county taxpayers. Sovereign authority is used to enforce an administrative objective that is not supportable by market forces. In contrast, moral suasion **and threats of penalties are** used to induce commercial property owners to recycle wastes. Charging commercial refuse generators a price near the long run marginal cost to the county of providing the service would bring the power of market forces to bear, encouraging greater recycling by commercial property owners while discouraging waste generation.

Year-round, county-wide residential yard waste recycling enables county staff to measure (meter) a component of the waste stream that is almost entirely recyclable. However, it has multiple effects on disposal expenses. It directly imposes the cost of the collection system, distorts commercial rental and sales markets for homeowner yard equipment and services, and indirectly contributes to costs by encouraging households to dispose of yard waste through county operated waste systems rather than processing these wastes in situ.

Mischaracterization of Property Taxes as Service Charges

Multiple factors identify several county solid waste "service charges" as taxes. Payment of the assessed "Base System Benefit Charge" and "Incremental Systems Benefit Charge" are non-discretionary, payable whether the "service" is used or not. (At the time of the 2000 decennial census, 10,067 of 324,565 housing units in the county were vacant.) Pronounced differential developments in solid waste charges by type of property as shown in Table 3 reveal income distributional effects between broad classes of property owners. Substantial annual fluctuation in the "Solid Waste Disposal Fee" levied on single family dwelling properties further discloses income redistributional effects between classes of property. Charging the same waste disposal fee for all single family properties regardless of the volume of refuse generated similarly is redistributional. The "Base System Benefit Charge" assessed against all properties in the county is primarily a revenue measure imposed to finance government investment in uneconomic facilities.