ATTACHMENT IV

COMMERCIAL WASTE QUANTITIES AND PROJECTIONS FOR PLAN PERIOD

COMMERCIAL WASTE QUANTITIES AND PROJECTIONS FOR PLAN PERIOD

1.0 INTRODUCTION

This section discusses the quantities of waste generated within the City that are collected and managed by private carters, i.e., the Commercial Waste stream. These waste quantities were examined in detail as Volume II of the Commercial Waste Management Study (CWM Study), which is provided as Appendix E of the New SWMP. The information in this section is a summary of that report. "Commercial Waste," as the term is used here, is comprised of three types of waste as defined in DSNY Rules: (1) putrescible waste[1]; (2) non-putrescible waste[2]; and (3) fill material[3], which can be characterized as follows:.

1. Putrescible waste – Waste generated daily by the City's business establishments that is office waste with small quantities of putrescible material, and also includes restaurant and other waste type of Municipal Solid Waste from commercial sources. Significant amounts of office waste are recycled directly at the source by carters that primarily collect recyclable office paper from commercial buildings and deliver it to recyclers, exporters or paper manufacturers. Consistent with DSNY rules, putrescible waste referred to in this report is inclusive of the fractions that are disposed and recycled. Some additional recycling occurs at the City's putrescible transfer stations, where old corrugated containers, commonly referred to as cardboard (OCC), and concentrated loads of office paper are diverted to recyclers.

2. Non-putrescible waste – Inert waste generated from commercial and residential demolition, new construction and renovation projects. This waste can vary significantly with the volume of construction activity in the City. It is comprised of a range of inert materials, some of which is recycled. The non-recycled fraction of the waste is densified and transferred to the City's non-putrescible transfer stations for disposal. This report also refers to this waste as construction and demolition (C&D) debris to distinguish it from fill material, which is also a category of non-putrescible waste.

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[1] Putrescible solid waste is solid waste containing organic matter having the tendency to decompose with the formation of malodorous by-products.

[2] Non-putrescible solid waste, as defined in DSNY rules (Subchapter A of 4 RCNY 16), is solid waste, whether or not contained in receptacles, that does not contain organic matter having the tendency to decompose with the formation of malodorous by-products, including but not limited to dirt, earth, plaster, concrete, rock, rubble, slag, ashes, waste timber, lumber, Plexiglas, fiberglass, ceramic tiles, asphalt, sheetrock, tar paper, tree stumps, wood, window frames, metal, steel, glass, plastic pipes and tubes, rubber hoses and tubes, electric wires and cables, paper and cardboard.

[3] Fill material, as defined in DSNY rules, is only clean material consisting of earth, ashes, dirt, concrete, rock, gravel, asphalt millings, stone or sand, provided that such material shall not contain organic matter having the tendency to decompose with the formation of malodorous by-products.

3. Fill material – A subset of non-putrescible waste, this is inert waste from non-building construction, comprised of materials such as excavated fill, stone rubble and road millings that are graded into materials such as sand and aggregate and stockpiled for reuse at the City's fill material transfer stations. Almost all fill material is reused in other building projects.

Significant quantities of materials in each of the above categories are recycled. This report also provides information on recycling within the putrescible waste category. The sum of waste disposed and waste recycled equals the waste generated in each category.

2.0 PUTRESCIBLE COMMERCIAL WASTE

A 2003 baseline estimate of commercial putrescible waste was developed using three different methodologies:

- A Facilities Based Method developed estimates of Commercial Waste processed using the following methods: inventoried Commercial Waste handled at the City's private transfer stations, using DSNY's Transfer Station Reporting System; surveyed out-of-City disposal facilities or transfer stations that receive direct deliveries of Commercial Waste originating in the City; and surveyed recyclers in the region to identify the quantify of recycled Commercial Waste from the City handled by processors, brokers, exporters and end users.
- An employment-based waste generation model was developed using industry sector employment at the two-digit SIC code level and waste generation factors for these types of industries based on a search of industry literature on this subject; and
- A survey of the City's licensed carters conducted by DSNY in cooperation with the Business Integrity Commission for the first six months of 2003 that identified the quantities of waste and recycled materials that was tipped at in-City transfer stations, tipped at out-of-City facilities or delivered to recyclers.

These methodologies are described in detail in Volume II of the CWM Study, which is provided as Appendix F of the New SWMP. Table IV 2-1 shows the Calendar Year 2003 estimate of commercial putrescible waste.

Table IV 2-1
2003 Estimate of Putrescible Solid Waste - Disposed and Recycled

Material/Destination	2003 Estimate TPY	TPD
Waste Disposed	2,261,355	7,248
Waste Recycled	824,116	2,641
Total Generation (Disposed & Recycled)	3,085,000	9,889
Recycling Percentage	27%	

The 2003 baseline waste estimate was allocated among the five boroughs using data on carter collection routes obtained from the BIC-DSNY carter survey. Based on this borough allocation, and using projected employment over this period, the quantity of Commercial Waste generated (both disposed and recycled) was forecast for the period of the New SWMP for each borough. The relative proportions of waste generated by each borough change as a function of changes in projected employment over time. The forecast assumes that the percentage of materials recycled by each borough would remain constant at 2003 levels[4] for the period of the New SWMP. These projections are discussed in Appendix F, Volume II of the CWM Study.

Table IV 2-2 shows the generation of commercial putrescible waste by borough, through the year 2024.

3.0 NON-PUTRESCIBLE (C&D AND FILL) COMMERCIAL WASTE

Table IV 3-1 presents the DSNY-reported quantities of clean fill and non-putrescible C&D waste, which together equal the total quantity of C&D debris in the City, for 2003. Total tons are estimated at 8.64 million by using data from the first three quarters of 2003 from DSNY Quarterly Transfer Station reports, and assuming that the fourth quarter would average 100% of the third quarter for fill, and 90% of the third quarter for C&D.

[4] Percentages developed from 2003 BIC-DSNY City carter collection truck and fax-back surveys data plus recycling at City transfer stations plus estimated recycling through the deposit container redemption system.

Table IV 2-2
Generation of Commercial Putrescible Waste by Borough, 2003 through 2024[(1)(2)]

	2003 (tons)	2005 (tons)	2010 (tons)	2015 (tons)	2020 (tons)	2024 (tons)
Bronx	398,000	400,000	413,000	424,000	443,000	458,000
Brooklyn	599,000	602,000	611,000	619,000	633,000	640,000
Manhattan	1,306,000	1,355,000	1,380,000	1,406,000	1,429,000	1,446,000
Queens	623,000	627,000	642,000	653,000	673,000	687,000
Staten Island	160,000	161,000	168,000	173,000	180,000	183,000
Total (tons/yr)	3,086,000	3,145,000	3,214,000	3,275,000	3,358,000	3,414,000

Notes:
(1) 2003 derived by multiplying generation quantities (CWM Study, Volume II, Appendix D, Table 1.5-1) by borough of origin (CWM Study, Volume II, Appendix D, Table 1.5-2). 2005 through 2024 derived from employment-generation factors.
(2) Numbers may not add due to rounding.

Table IV 3-1
DSNY-Reported Quantities of Clean Fill and Non-Putrescible C&D Waste

Item	2003[2]
Tons per day input[1]	
Non-Putrescible C&D	8,626
Clean Fill C&D	19,069
Total C&D	27,695
Tons per year input	
Non-Putrescible C&D	2,691,390
Clean Fill C&D	5,949,450
Total C&D	8,640,840
Clean fill as percent of Total C&D	68.9%

Notes:
(1) Based upon 312 days per year of operation.
(2) 2003 consists of first three quarters, plus fourth quarter estimated at 90% of third quarter for non-putrescible and 100% of third quarter tonnages for fill material.

Reported quantities of C&D ranged from 6.35 million tons in 2000 to 7.9 million tons in 2002. Average daily tonnage is in the 20,000 to 25,000 range, and a baseline number of 7,058,704 tons was calculated for the year 2003, as the baseline total for C&D debris. Of the total C&D, approximately 60% was determined to be clean fill material. Because of the significant variability in total quantities of C&D generated over these periods, future estimates of generation use two different baseline totals for the year 2005.

Quantities of non-putrescible waste, which include C&D debris and fill material, were estimated based upon waste generation rates derived from a literature search for three types of residential and commercial construction projects: new construction, demolition and renovation. A regression analysis using data from F.W. Dodge on actual and projected construction activity over the period of 2000 to 2007 in the City for each of the respective categories was used to develop a trend line for the generation of C&D waste over the period of the New SWMP. Non-building-related C&D, which would include clean fill, was estimated by obtaining waste

generation factors expressed as tons per $1,000 of activity. These factors were applied to the value of this construction in the City obtained from F.W. Dodge. Details of these estimates are discussed in Volume II of Appendix F of the CWM Study.

As discussed in Volume II of the CWM Study, data for non-putrescible waste for the years 2000 through 2002 showed that, on average, clean fill represented approximately 60% of the total amount of C&D, and non-putrescible C&D represented the remaining 40%. However, the 2003 data shows that clean fill appears to be accounting for an ever larger percentage of C&D debris, totaling almost 70%. Therefore, in allocating the total quantity of C&D waste into non-putrescible and clean fill components, a range was derived, with clean fill constituting between 60% and 70% of the total material, and C&D constituting between 30% and 40% of the total.

Tables IV 3-2 and IV 3-3 disaggregate the total estimate for C&D debris into the fill material and non-putrescible categories used by the City in regulating its transfer stations, on a tons per year basis. Two tables were developed to reflect the substantial difference in total non-putrescible waste generation during the period 2001-2002 and the year 2003. In these tables, fill is shown as ranging from 60% to 70% of the total C&D, with the remainder allocated to the non-putrescible category. These tables utilize the 2003 baseline quantity of C&D material, and utilize the previously described methodology to project these quantities for the period of the New SWMP.

Table IV 3-2
Range of Quantities of Non-Putrescible and Fill Material, 2005-2024
(Based upon Average Data for 2000-2002, in Tons per Year)

Year	Average (2000-2002) Estimate (Using 1.96)				
		Non-Putrescible		Fill	
	Total	30%	40%	60%	70%
2005	6,151,000	1,845,000	2,460,000	3,691,000	4,306,000
2010	6,896,000	2,069,000	2,759,000	4,138,000	4,827,000
2015	7,310,000	2,193,000	2,924,000	4,386,000	5,117,000
2020	7,699,000	2,310,000	3,079,000	4,619,000	5,389,000
2024	8,001,000	2,400,000	3,200,000	4,800,000	5,601,000

Table IV 3-3
Range of Quantities of Non-Putrescible and Fill Material, 2005-2024
(Based upon 2003 Data, in Tons per Year)

Year		Upper Estimate (Using 2.97)			
		Non-Putrescible		Fill	
	Total	30%	40%	60%	70%
2005	8,350,000	2,505,000	3,340,000	5,010,000	5,845,000
2010	9,437,000	2,831,000	3,775,000	5,662,000	6,606,000
2015	9,983,000	2,995,000	3,993,000	5,990,000	6,988,000
2020	10,482,000	3,145,000	4,193,000	6,289,000	7,337,000
2024	10,862,000	3,259,000	4,345,000	6,517,000	7,603,000

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