



SAINT LUCIA SOLID WASTE MANAGEMENT AUTHORITY

WASTE CHARACTERISATION STUDY

GROS-ISLET & ANSE-LA RAYE/CANARIES
WASTE COLLECTION ZONES
2018



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1.0 INTRODUCTION

The Saint Lucia Solid Waste Management Authority was established by an Act of Parliament in 1996 with a mandate to provide coordinated and integrated systems for the collection, treatment, recycling and disposal of solid waste, including hazardous waste, and to establish and manage sanitary landfills.

Consistent with its mandate, the Authority is responsible for the collection of solid waste generated from residential properties, government offices and institutions including school, hospitals and other health care establishments, prisons, etc. which will be referred to as municipal solid waste (MSW) in this report. The collection of this waste is undertaken by private waste hauler within the eleven (11) waste collection zones of which the island is divided.

In addition, the Authority has the mandate to provide for the disposal of solid waste, and in this respect operates two waste disposal facilities, namely the Deglos Sanitary Landfill located in the north of the island and the Vieux Fort Solid Waste Management Facility in the south of the island.

The Authority, cognizant of the importance of waste characterisation in planning solid waste management systems and their operations undertook a waste characterization study of regular solid waste generated by households, government offices, schools, health care institutions, prisons, etc. in two (2) of the eleven (11) waste collection zones. The study was undertaken in an urban collection zone namely Gros Islet and a rural collection zone, namely Anse La Raye/Canaries.

Waste characterisation is generally defined to include descriptions of the composition and quantities of solid waste and the materials that comprise it. Characterisation of waste is a fundamental aspect of solid waste management since management entails the handling, processing and conversion of materials.

The composition of waste is usually described as the percentage of each component present as a part of the total waste mass usually expressed in kilograms per capita per day (kg/capita/day). Due to this heterogeneity and the variability of MSW it was necessary to carry out a statistically designed sampling survey by which the composition of waste could be accurately estimated.

2.0 METHODOLOGY

2.1 Introduction

The waste characterisation study utilized the test method from the American Society for Testing and Materials (ASTM). This method describes procedures for measuring the composition of unprocessed MSW by employing manual sorting. It applies to the determination of the mean composition of MSW based on the collection and manual sorting of a number of samples of waste over a period of seven (7) days i.e. from Monday to Saturday.

The recommended sample weight of approximately 200 pounds was used for the study because it has been found through numerous studies that measurements made on a sample size of about 200 pounds vary insignificantly from measurements made on samples of up to 1,700 pounds taken from the same waste.

For the purpose of this study, nine (9) waste categories were selected for sampling. These categories were further broken down into 44 waste components. A waste component is a constituent of the solid waste stream composed of materials of similar properties and chemical composition (see Appendix 1). The nine major categories are as follows:

- Paper and Paperboard
- Glass
- Metal
- Plastic
- Textiles
- Organics
- Construction and Demolition (C & D) Wastes
- Special Care Wastes
- Other Wastes

2.2 Determination of the Number of Samples

In order to obtain reliable results from the waste characterisation study, it was necessary to determine the minimum number of samples that should be analyzed and evaluated to obtain data with reasonable accuracy. To meet this statistical requirement, the number of samples for the survey, i.e. thirty-nine (39) was determined using the methodology from

the ASTM. One sample was sorted on each waste day on each waste collection route in the two zones over the six-day sampling period.

2.3 Methodology

1. Vehicle loads of waste are designated for sampling, and a sorting sample of approximately 90 kilograms is collected from the discharged vehicle load.
2. The sample is sorted manually into the predetermined waste components. The weight fractions of each component in the sorting sample is calculated from the weights of the components.
3. The mean waste composition is calculated using the results of the composition of the sorting samples.

3.0 EQUIPMENT

The equipment used to conduct the survey is listed in Appendix 3.

4.0 PROCEDURE

1. Forty-one (41) storage containers were labeled with the waste components selected for sampling. These containers were arranged under a covered area and the tare weight recorded.
2. The hanging scale was placed in the vicinity of the storage containers. The accuracy of the scale was determined with a known (reference) weight.
3. A flat and level area for the discharge of the vehicle load was identified next to the tipping cell. A clean heavy-duty tarpaulin was placed in this area for the discharge of the sorting sample.
4. The first load of waste from each waste collection zone was selected for sampling.
5. Information on the sampled RCV was obtained from the driver and recorded on the prescribed pro forma. This information included the collection area, name of contractor, name of driver, type of vehicle, date and time (See appendix 2).

6. The RCV operator was then directed to discharge the load onto the clean surface in one pile.
7. Using an excavator, a sample was removed from the discharged load and placed onto the tarpaulin following coning of the waste. A 90 kilogram sample was obtained from the load and weighed using a crane scale.
8. This sorting sample was then transported to the sampling area for sorting.
9. All containers from the sorting sample were emptied of their contents, such as capped jars, paper bags, plastic bags, etc. Each waste item was segregated and placed in the appropriately labeled storage container.
10. In the case of composite items found in the waste, the individual materials were separated where practical and the separated materials placed in the appropriately labelled storage containers.
11. Sorting continued until the maximum particle size of the remaining waste particles was approximately 12.7 mm at which point, the remaining particles were apportioned into the storage containers corresponding to the waste components represented in the remaining mixture.
12. The gross weights of the storage containers were then recorded on the prescribed pro forma including waste items sorted but not stored in the containers.
13. Following the weighing of the wastes from the sorting area, it was then removed by the excavator and the area readied for the next sorting sample.

5.0 HEALTH AND SAFETY

Because of the hazards associated with the sorting of solid waste, the Authority undertook measures to ensure the protection of the members of the sorting team. These measures included the review of hazards likely to be encountered during sorting and the provision of personal protective equipment.

Sorters were instructed on the possible dangers posed particularly by projectiles that may issue from the waste during the process of unloading from collection vehicles. These projectiles may include flying glass particles from breaking glass containers and metal lids

from plastic and metal containers that burst under pressure when run over by heavy equipment.

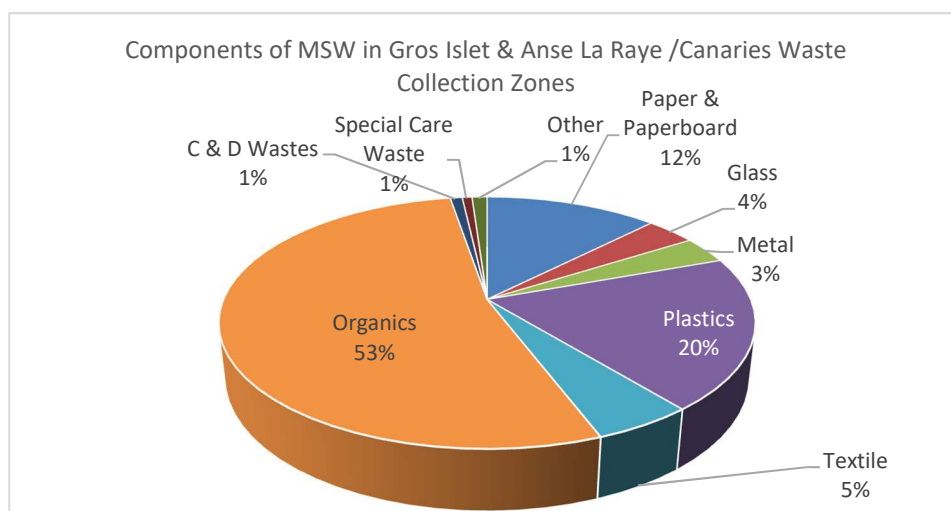
Also, the dangers posed by sharp objects, such as nails, razor blades, hypodermic needles and broken glass, which may be present in solid waste were also stressed. The Operations and Landfill Manager who supervised the study ensured that sorting personnel adhered to all health and safety measures and precautions.

6.0 SURVEY RESULTS

6.1 Gros Islet and Anse La Raye/Canaries Waste Collection Zones

The waste characterisation study revealed that organic materials represented the single largest component of the MSW stream in the two waste collection zones combined, accounting for approximately fifty-three percent (53%) by weight followed by plastics twenty percent (20%), paper & paperboard twelve percent (12%), textile five percent (5%), glass four percent (4%) and metal three percent (3%) (See Figure 1).

Figure 1

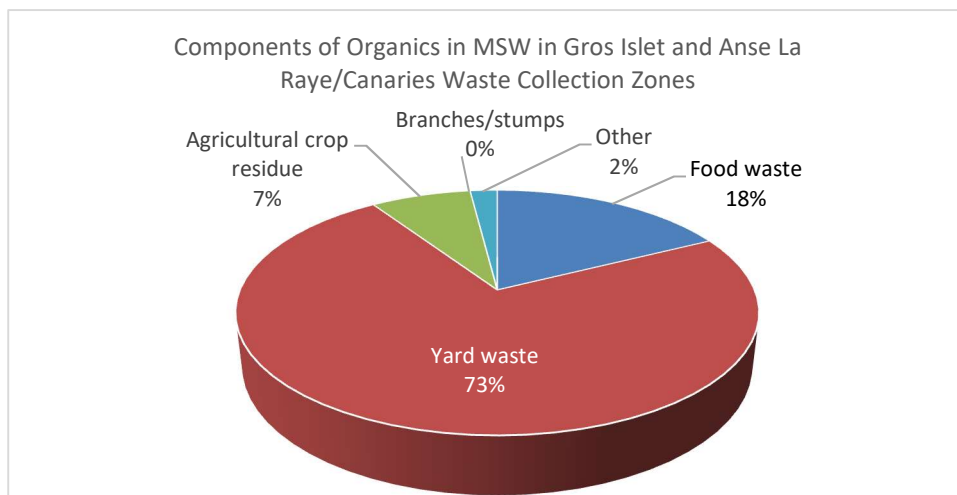


Major Waste Components

Organics

Further examination of the components which comprise organics revealed that food waste and yard waste accounted for ninety-one (91) percent of all organics disposed followed by agricultural crop residue accounting for approximately seven percent (7%) (See figure 2).

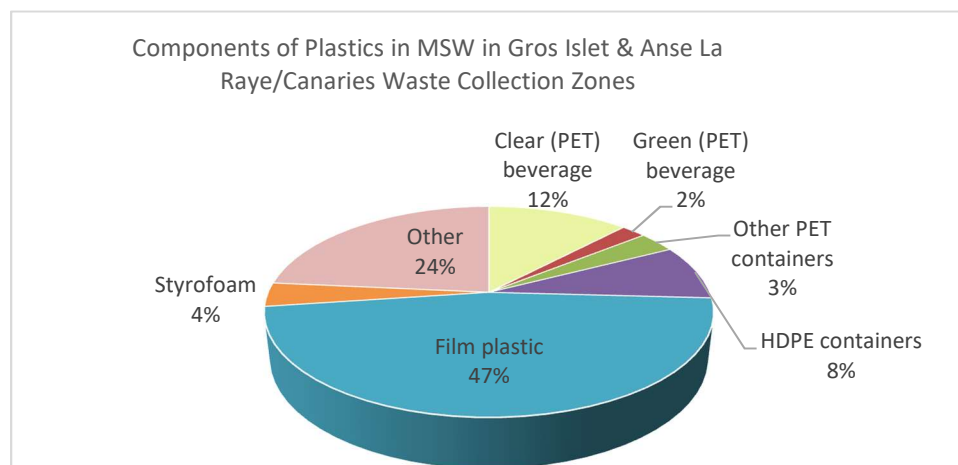
Figure 2



Plastics

With respect to the plastics category, film plastics accounted for forty-seven percent (47%) of all plastics disposed of followed by “other plastics” with twenty-four percent (24%). Clear PET bottles accounted twelve percent (12%), followed by HDPE containers accounting for eight percent (8%), Styrofoam accounting for four percent (4%) of the waste (See figure 3).

Figure 3

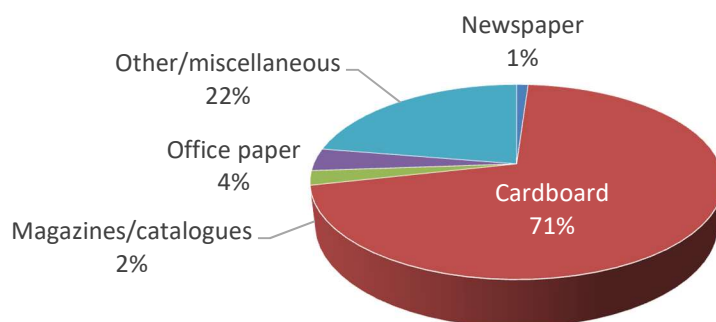


Paper & Paperboard

Paper & paperboard accounted for twelve percent (12%) of the waste. An examination of the components comprising this category revealed that cardboard accounted for seventy percent (70%), followed by other paper with twenty percent (20%), office paper with four percent (4%), magazine/catalogue with two percent (2%) and newspaper with one percent (1%) (See figure 4).

Figure 4

Components of Paper & Paperboard in MSW in Gros Islet & Anse La Raye/Canaries Waste Collection Zones

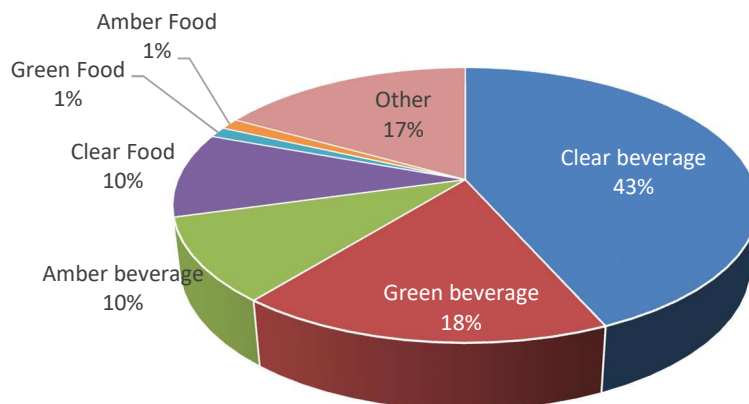


Glass

Glass accounted for four percent (4%) of the waste disposed of. An examination of the components comprising this category revealed that clear glass beverage containers accounted for forty-three percent (43%), followed by green beverage containers with eighteen percent (18%), other glass containers with seventeen percent (17%), clear food containers and amber beverage containers each accounting for ten (10%) (See figure 5).

Figure 5

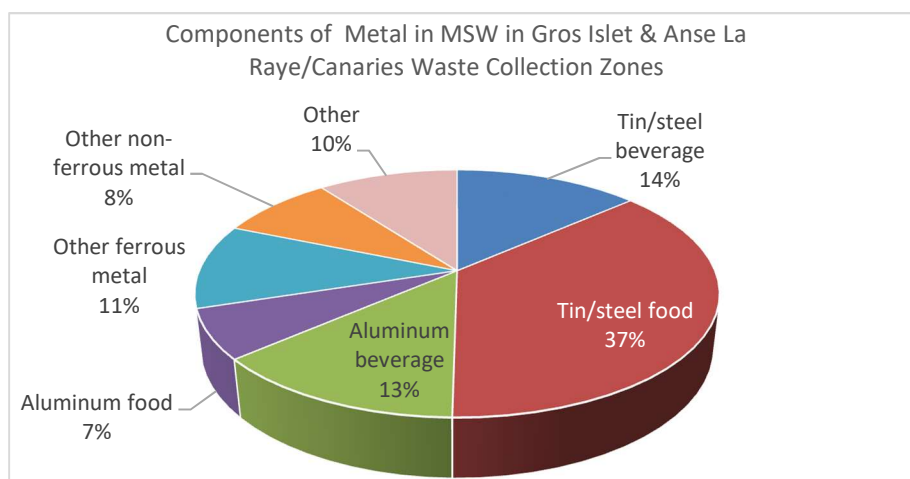
Components of Glass in MSW in Gros Islet & Anse La Raye/Canaries Waste Collection Zones



Metals

Metals accounted for three percent (3%) of the waste disposed of. An examination of the components comprising this category revealed that steel/tin food containers accounted for thirty-seven percent (37%) by weight of this category, followed by steel/tin beverage containers with fourteen percent (14%), aluminum beverage containers with thirteen percent (13%), other ferrous metal containers with eleven percent (11%), other metal containers with ten percent (10%), other non-ferrous container with eight percent (8%) and aluminum food containers with seven percent (7%) (See figure 6).

Figure 6



Waste Quantities

The two waste collection zones accounted for an average of four hundred and forty (440) tons of waste per month. When extrapolated, waste quantities for the various components based on the waste characterization study are as follows:

Component	Percent	Waste Quantity (tons)
Paper & Paperboard	12	53
Glass	4	18
Metal	3	13
Plastics	20	97
Textile	5	22
Organics	53	233
C & D Wastes	1	4

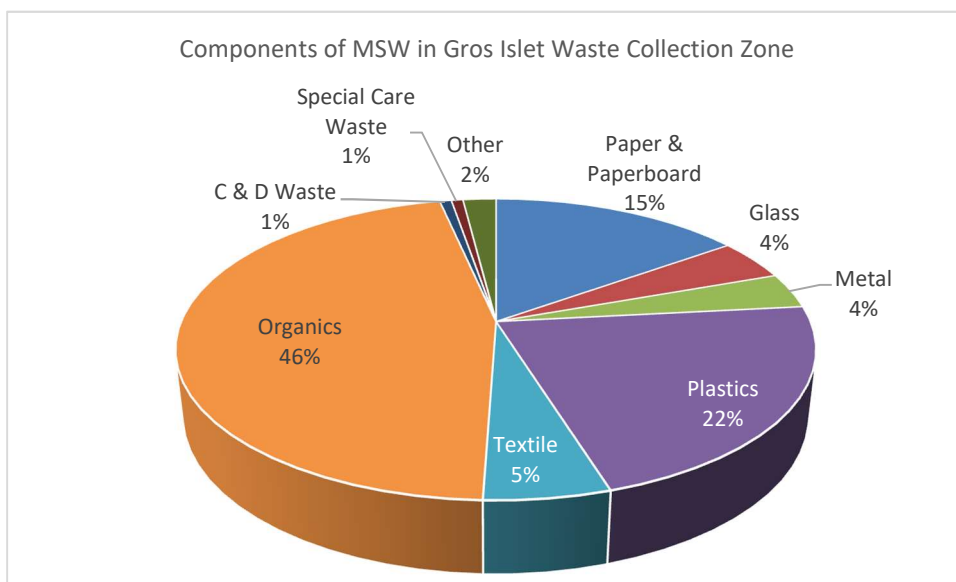
A further breakdown of the major categories revealed the following quantities for each waste component disposed per month when extrapolated.

Component	Percent	Waste Quantity (tons)
Paper & Paperboard		
Newspaper	1.1	0.53
Cardboard	70.4	37
Magazines/catalogues	2.4	1.3
Office paper	3.7	2
Other/miscellaneous	22.4	12
TOTAL	100	52.8
Glass		
Clear beverage containers	43.4	8
Green beverage containers	17.5	3
Amber beverage containers	9.8	2
Clear Food Containers	10.0	2
Green Food Containers	1.2	0.2
Amber Food Containers	1.3	0.2
Remainder/composite glass	16.9	3
TOTAL	100	18.4
Metal		
Tin/steel beverage	13.6	2
Tin/steel food	36.7	5
Aluminum beverage	13.5	2
Aluminum food	6.5	1
Other ferrous metal	11.1	2
Other non-ferrous metal	8.5	1
Other	10.3	1.3
TOTAL	100	14.3
Plastics		
Clear (PET) beverage	12.2	11.8
Green (PET) beverage	2.1	2
Other PET containers	3.2	3
HDPE containers	8.4	8
Film plastic	47.0	46
Styrofoam	3.6	3
Other	23.5	23
TOTAL	100	96.8

6.2 Gros Islet Solid Waste Collection Zone

For the Gros Islet Solid Waste Collection zone organic material represented forty-six percent (46%) of the MSW stream followed by plastics at twenty-two percent (22%), paper & paperboard at fifteen percent (15%), textile at five percent (5%), glass at four percent (4%) and metal at four percent (4%) (See Figure 7).

Figure 7



When the data is extrapolated, the following waste quantities are arrived at for the Gros Islet Solid Waste Collection Zone.

Component	Percent	Waste Quantity (tons)
Paper & Paperboard	15.2	47.1
Glass	4.4	13.6
Metal	3.8	11.8
Plastics	21.9	67.9
Textile	5.4	16.7
Organics	46.2	143.2
C & D Wastes	0.7	2.2

Further extrapolation by category components revealed the following waste quantities:

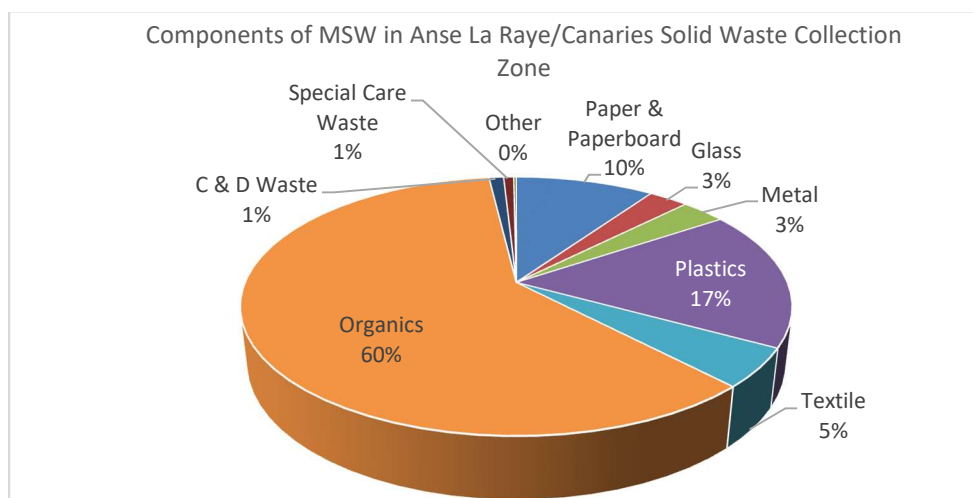
Component	Percent	Waste Quantity (tons)
Paper & Paperboard		
Newspaper	1.3	0.6
Cardboard	66.3	31.2
Magazines/catalogues	3.0	1.4
Office paper	5.6	2.6
Other/miscellaneous	23.7	11.2

TOTAL	100	11.2
Glass		
Clear beverage containers	44.4	6.2
Green beverage containers	17.8	2.5
Amber beverage containers	11.7	1.6
Clear Food Containers	9.6	1.3
Green Food Containers	0.5	0.1
Amber Food Containers	0.8	0.1
Remainder/composite glass	15.3	2.1
TOTAL	100	14
Metal		
Tin/steel beverage	17.6	2.1
Tin/steel food	31.6	3.8
Aluminum beverage	7.2	0.9
Aluminum food	9.9	1.2
Other ferrous metal	13.7	1.6
Other non-ferrous metal	11.2	1.3
Other	8.7	1.0
TOTAL	100	12
Plastics		
Clear (PET) beverage	10.3	7.0
Green (PET) beverage	1.6	1.1
Other PET containers	3.5	2.4
HDPE containers	9.0	6.1
Film plastic	49.5	33.7
Styrofoam	4.6	3.1
Other	21.5	14.6
TOTAL	100	68

6.3 Anse La Raye/Canaries Solid Waste Collection Zone

For the Anse La Raye/Canaries Solid Waste Collection zone organic material represented sixty percent (60%) of the MSW stream followed by plastics at seventeen percent (17%), paper & paperboard at ten percent (10%), textile at five percent (5%), and glass and metal at 3 percent (3%) each (see Figure 8).

Figure 8



When the data is extrapolated, the following waste quantities are arrived at for the Gros Islet Solid Waste Collection Zone.

Component	Percent	Waste Quantity (tons)
Paper & Paperboard	9.7	12.6
Glass	2.8	3.6
Metal	3.1	4.1
Plastics	17.4	22.6
Textile	4.9	6.3
Organics	60.2	78.3
C & D Wastes	1.0	1.3
Special Care Waste	0.7	0.9
Other	0.2	0.2

Further extrapolation by category components revealed the following waste quantities:

Component	Percent	Waste Quantity (tons)
Paper & Paperboard		
Newspaper	0.8	0.1
Cardboard	74.5	9.4
Magazines/catalogues	1.8	0.2
Office paper	1.8	0.2
Other/miscellaneous	21.1	2.7
TOTAL	100	12.6
Glass		
Clear beverage containers	42.3	1.2
Green beverage containers	17.2	0.5

Amber beverage containers	8.0	0.2
Clear Food Containers	10.4	0.3
Green Food Containers	2.0	0.1
Amber Food Containers	1.8	0.0
Remainder/composite glass	18.4	0.5
TOTAL	100	2.8
Metal		
Tin/steel beverage	9.6	0.4
Tin/steel food	41.7	1.7
Aluminum beverage	19.7	0.8
Aluminum food	3.1	0.1
Other ferrous metal	8.4	0.3
Other non-ferrous metal	5.7	0.2
Other	11.9	0.5
TOTAL	100	4
Plastics		
Clear (PET) beverage	14.0	3.2
Green (PET) beverage	2.6	0.6
Other PET containers	2.9	0.7
HDPE containers	7.8	1.8
Film plastic	44.5	10.1
Styrofoam	2.7	0.6
Other	25.6	5.8
TOTAL	100	22.8

8.0 CONCLUSION

The study showed that organic materials represented the single largest component of the MSW stream in the two solid waste collection zones combined, accounting for approximately fifty-three percent (53%) by weight, followed by plastics, twenty percent (20%) and paper & paperboard with twelve percent (12%). The findings are consistent with the findings of a waste characterisation study for all waste collection zones undertaken by the Authority in 2008. In that study, organics accounted for forty-five percent (45%), plastics twenty-two percent (22%), and paper & paperboard ten percent (10%) among the major categories.

The survey confirmed the long held fact that rural populations (Anse La Raye/Canaries) generate less paper & paperboard, plastics, glass and metals than do urban populations (Gros Islet) and more organics than do urban populations.

APPENDIX 1

Descriptions of Waste Components/Categories

PAPER AND PAPERBOARD

1 "Newspaper" means paper used in newspapers. This type includes newspaper and all items made from newsprint, such as free advertising guides.

2 "Cardboard" usually has three layers. The center wavy layer is sandwiched between the two outer layers. It does not have any wax coating on the inside or outside. This type does not include chipboard. This type includes entire cardboard containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces of boxes and cartons. This type does not include chipboard.

3 "Magazines and Catalogues" means items made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light. This type includes glossy magazines, catalogues, brochures, and pamphlets.

4."Office Paper" means paper generated in an office setting and includes computer paper, white envelopes white window envelopes, notebook paper, ground wood computer paper, carbonless forms, goldenrod coloured paper and school construction paper.

5 "Other Miscellaneous Paper" means items made mostly of paper that do not fit into any of the other paper types. This includes telephone books and directories, items made of chipboard, ground wood paper, and deep-toned or fluorescent dyed paper. Examples includes unused paper plates and cups, perforated edge (fan-fold) computer paper, manila folders, manila envelopes, index cards, white envelopes, butcher paper, and hard cover and soft cover books, waxed corrugated cardboard, aseptic packages, plastic-coated paper milk cartons, waxed paper, tissue, paper towels, blueprints, sepia, onion skin, fast food wrappers, carbon paper, self-adhesive notes, and photographs.

GLASS

6 "Clear (Glass) Beverage Containers" means clear glass beverage containers. This type includes whole or broken clear soda, beer, fruit juice, liquor bottles, etc.

7 "Green (Glass) Beverage Containers" means green, glass beverage containers. This type includes whole or broken green soda and beer bottles.

8 "Amber (Glass) Beverage Containers" means amber glass beverage containers. This type includes whole or broken brown soda and beer bottles.

9 "Clear (Glass) Food Containers" means clear glass food containers. This type includes whole or broken clear fruit, jam, mayonnaise, peanut butter jars etc.

10 "Green (Glass) Food Containers" means green, glass food containers. This type includes whole or broken green glass food jars.

11 "Amber (Glass) Food Containers" means amber glass food containers. This type includes whole or broken brown glass food jars.

12 "Remainder/Composite Glass" means glass that cannot be put in any other type or types. It includes flat (pane) glass as well as items made mostly of glass but combined with other materials. This type includes window glass, Pyrex, Corning ware, crystal and other glass tableware, mirrors, light bulbs, and auto windshields.

METAL

13 "Tin/Steel Beverage Containers" means rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This type is used to store beverage. This type includes beverage containers including bimetal containers with steel sides and aluminum ends.

14 "Tin/Steel Food Containers" means rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This type is used to store food. This type includes food containers including bimetal containers with steel sides and aluminum ends.

15 "Aluminum Beverage Containers" means any beverage container made mainly of aluminum. This type includes aluminum soda or beer cans. This type does not include bi-metal containers with steel sides and aluminum ends.

16 "Aluminum Food Containers" means any food container made mainly of aluminum. This type includes aluminum human and pet food containers. This type does not include bi-metal containers with steel sides and aluminum ends.

17 "Other Ferrous Metal" means any other ferrous metal items not mentioned above.

18 "Other Non-Ferrous Metal" means any other non-ferrous metal items not mentioned above.

19 "Remainder/Composite Metal Containers" means metal that cannot be put into any of the aforementioned categories.

PLASTICS

20 PET Beverage Containers (Clear)" means clear PETE (polyethylene terephthalate) beverage containers. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET". The colour is usually transparent green or clear. A PETE container usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. This type includes juice, soft drink and water bottles and some liquor bottles.

21 PET Beverage Containers (Green)" means green PETE (polyethylene terephthalate) beverage containers. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET". The colour is usually transparent green or clear. A PETE container usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. This type includes juice, soft drink and water bottles and some liquor bottles.

22 "Water-Containing PET Containers" means clear or coloured PETE (polyethylene terephthalate) containers containing water. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET". The colour is usually transparent green or clear. A PETE container usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. This type includes juice, soft drink and water bottles and some liquor bottles

23 "Other PET Containers" means clear or coloured PETE (polyethylene terephthalate) containers not including the above three categories. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET". The colour is usually transparent green or clear. A PETE container usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. This type includes cooking oil containers and aspirin bottles.

24 "HDPE Containers" means natural and coloured HDPE (high-density polyethylene) containers. This plastic is usually either cloudy white, allowing light to pass through it (natural) or a solid colour, preventing light from passing through it (coloured). When marked for identification, it bears the number "2" in the triangular recycling symbol. This type includes milk jugs, water jugs, detergent bottles, some hair-care bottles, empty motor oil, empty antifreeze, and other empty vehicle and equipment fluid containers.

25 "Film Plastic" means flexible plastic sheeting. It is made from a variety of plastic resins including high-density polyethylene (HDPE) and low-density polyethylene (LDPE). It can be easily contoured around an object by hand pressure. This type includes plastic garbage bags, agricultural film, food bags, dry cleaning bags, grocery store bags, packaging wrap, and food wrap. This type does not include rigid bubble packaging.

26 "Remainder/Composite Plastics" means plastic items not mentioned above. This includes containers made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate). Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these items may bear the number "3", "4", "5", "6", or "7" in the triangular recycling symbol. This type includes food containers such as bottles for salad dressings and vegetable oils, flexible and brittle yogurt cups, syrup bottles, margarine tubs and microwave food trays. This type also includes some shampoo containers and vitamin bottles, plastic outdoor furniture, plastic toys and sporting goods, and plastic housewares, such as mop buckets, dishes, cups, and cutlery. It also includes building materials such as house siding, window sashes and frames, housings for electronics such as computers, televisions and stereos, and plastic pipes and fittings.

TEXTILES

27 "Textiles" means items made of thread, yarn, fabric, or cloth. This type includes clothes, fabric trimmings, draperies, carpets, carpet padding and all natural and synthetic cloth fibers. This type does not include cloth-covered furniture, mattresses, leather shoes, leather bags, or leather belts.

ORGANICS

28 "Food Waste" means food material resulting from the processing, storage, preparation, cooking, handling, or consumption of food. This type includes material from industrial, commercial, or residential sources. This type includes discarded meat scraps, dairy products, eggshells, fruit or vegetable peels, and other food items from homes, stores, and restaurants. This type includes processed residues or material from canneries, distilleries, breweries, or other industrial sources.

29 "Yard Waste" means non-food organic materials resulting from property landscaping and maintenance. This type includes leaves, trees, grass cuttings.

30 "Agricultural Crop Residue" means food organic materials resulting from agricultural harvesting and vegetable. This type includes prunings, shrubs, branches, stumps, tree trunks.

31 "Branches/Stumps" means non-food organic materials resulting from property maintenance and construction activity. This type includes branches, stumps, and tree trunks.

32 "Remainder/Composite Organic" means organic material that cannot be put in any of the above categories. This includes items made mostly of organic materials, but combined with other material types. This type includes leather items, cork, hemp rope, garden hoses, rubber items, hair, cigarette butts, diapers, feminine hygiene products, small wood products (such as Popsicle sticks and tooth picks), agricultural manures and animal feces.

CONSTRUCTION AND DEMOLITION (C & D) MATERIALS

33 "Concrete " means a hard material made from sand, aggregate gravel, cement mix and water as well as masonry bricks and mortar. This type includes pieces of building foundations, concrete paving, concrete blocks and clay bricks.

34 "Lumber" means processed wood for building, manufacturing, landscaping, packaging, and processed wood from demolition. This type includes dimensional lumber, lumber cutoffs, engineered wood such as plywood and particleboard, wood scraps, pallets, wood fencing, wood shake roofing, and wood siding.

35 "Remainder/Composite Construction and Demolition" means construction and demolition material that cannot be put into any of the above categories. This type may include items from different categories combined, which would be very difficult to separate. This type includes ceramics, tiles, toilets, sinks, and fiberglass insulation, rock, stones, and sand, clay, soil and other fines. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board, and aluminum scrap, shingles and other roofing material.

SPECIAL CARE WASTES

36 "Paint" means containers with paint in them. Examples: This type includes latex paint, oil based paint, and tubes of pigment or fine art paint. This type does not include dried paint, empty paint cans, or empty aerosol containers.

37 "Hazardous Materials" means containerized liquids, solids and gases that are potentially hazardous to human health or the environment. This type includes acids, bases, oxidizers and flammable materials used in domestic and industrial applications. This type includes aerosol cleaners and lubricants, drain cleaner, paint solvent, anti-freeze, brake fluid and pressurized propane cylinders.

38 "Biomedical" means waste materials specifically associated with hospital and health care services and requiring specialized management. This type includes syringes, lab glass, heavily soiled dressings, tissue samples and pharmaceutical wastes. This type does not include non-hazardous health-care facility wastes generated through food preparation, building maintenance and administrative functions.

39 "Batteries" means any battery. This includes lead acid batteries, dry cell batteries, etc. from all sources.

40 "Oil Filters" means oil filters from automobiles.

41 "Remainder/composite Special Care Waste" " means material that cannot be put in any other type in the above categories.

OTHER WASTES

42 "Tires" means vehicle tires. This type includes tires from trucks, automobiles, motorcycles, heavy equipment, and bicycles.

43 "Furniture" means includes household and office furnishings not defined separately. This type includes all sizes and types of furniture, including mattresses, box springs, tables and chairs.

44 "Other" means material that cannot be put in any of the categories listed above. This category includes mixed residue that cannot be further sorted.

APPENDIX 2

SAINT LUCIA SOLID WASTE MANAGEMENT AUTHORITY Waste Characterisation Study Proforma

Date: _____ Time: _____ Vehicle Type: _____

Contractor: _____ Collection Zone: _____

NO.	MATERIAL TYPE	WEIGHT			
		Gross	Tare	Net	% of Total
PAPER & PAPERBOARD					
1	Newspapers				
2	Cardboard				
3	Magazines/Catalogs				
4	Office paper				
5	Other paper				
GLASS		Gross	Tare	Net	% of Total
6	Clear Beverage Containers				
7	Green Beverage Containers				
8	Amber Beverage Containers				
9	Clear Food Containers				
10	Green Food Containers				
11	Amber Food Containers				
12	Remainder/Composite Glass Containers				
METAL		Gross	Tare	Net	% of Total
13	Tin/Steel Beverage Containers				
14	Tin/Steel Food Containers				
15	Aluminum Beverage Containers				
16	Aluminum Food Containers				
17	Other Ferrous Metal Containers				
18	Other Non-ferrous Metal Containers				
19	Remainder/Composite Metal Containers				
PLASTICS		Gross	Tare	Net	% of Total
20	Clear Carbonated Beverage (PET)				
21	Green Carbonated Beverage (PET)				
22	Water Bottles (PET)				
23	Other PET				
24	HDPE Containers				
25	Film Plastic				
26	Remainder/Composite Plastics				
27	TEXTILE				
ORGANICS		Gross	Tare	Net	% of Total
28	Food Waste				
29	Yard Waste				
30	Agricultural Crop Residue				
31	Branches/Stumps				
32	Remainder/Composite				

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CONSTRUCTION & DEMOLITION WASTE		Gross	Tare	Net	% of Total
33	Concrete				
34	Lumber				
35	Remainder/Composite C&D				
SPECIAL CARE WASTE		Gross	Tare	Net	% of Total
36	Paint				
37	Hazardous Material				
38	Biomedical				
39	Batteries				
40	Oil filters				
41	Remainder/Composite Special Care Waste				
OTHER WASTES		Gross	Tare	Net	% of Total
42	Tires				
43	Furniture				
44	Other				

APPENDIX 3

List of Equipment for Waste Characterisation Study

Tarpaulins	Knives
Shovels	20-Litre Sorting Bins
Rakes	Dust Pans
Hand Rakes	First Aid Kit
Disposable Face Masks	Traffic Vests
Disposable Aprons	Leather/Latex Gloves
Rubber Boots	Safety Glasses
Hanging Scale	Coveralls
Crane Scale	Raincoats