APPENDICES

Appendix A

Letter from Natural Resources Committee

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STATE OF MAINE

ONE HUNDRED AND TWENTY-THIRD LEGISLATURE

COMMITTEE ON NATURAL RESOURCES

April 15, 2008

Martha Freeman, Director
State Planning Office
38 State House Station
Augusta, Maine 04333-0038

RE: LD 810, An Act To Improve Solid Waste Management

Dear Director Freeman:

As you may be aware, the Joint Standing Committee on Natural Resources recently voted LD 810 out of committee with an OUGHT TO PASS AS AMENDED report. One of the initiatives considered in an earlier draft version of the bill was having the Department of Environmental Protection and the State Planning Office conduct a review of the costs and benefits of state and local government options to stimulate an increase in the recycling of plastics, and report the findings and recommendations to this Committee in the next session. The types of plastics proposed to be studied include plastic bottles and rigid containers, numbered 1 through 7.

During work sessions on this bill, there was a sense from the Committee that although the results of this review could be valuable, there was a reluctance to include the review in LD 810. Upon discussion with your staff, they agreed to conduct this review if a letter requesting the review was sent by the Committee.

Please consider this letter as the Committee's request for your Office to conduct a review of the costs and benefits of state and local government options to stimulate an increase in the recycling of plastics. We appreciate the willingness of your staff to undertake this task and look forward to receiving a report on the review by January 5, 2009.

Sincerely,

Senator John Martin
Senate Chair

Ted Koffman

Representative Ted Koffman
House Chair

cc: Members, Joint Standing Committee on Natural Resources

Appendix B

Description and uses of plastic resins 1 through 7

American® Chemistry Council

Plastic Packaging Resins

Resin Codes	Descriptions	Properties	Product Applications	Products Made with Recycled Content*
1 PET	**Polyethylene Terephthalate (PET, PETE).** PET is clear, tough, and has good gas and moisture barrier properties. This resin is commonly used in beverage bottles and many injection-molded consumer product containers. Cleaned, recycled PET flakes and pellets are in great demand for spinning fiber for carpet yarns, producing fiberfill and geo-textiles. Nickname: Polyester.	• Clear and optically smooth surfaces for oriented films and bottles • Excellent barrier to oxygen, water, and carbon dioxide • High impact capability and shatter resistance • Excellent resistance to most solvents • Capability for hot-filling	Plastic bottles for soft drinks, water, juice, sports drinks, beer, mouthwash, catsup and salad dressing. Food jars for peanut butter, jelly, jam and pickles. Ovenable film and microwavable food trays. In addition to packaging, PET's major uses are textiles, monofilament, carpet, strapping, films, and engineering moldings.	Fiber for carpet, fleece jackets, comforter fill, and tote bags. Containers for food, beverages (bottles), and non-food items. Film and sheet. Strapping.
2 HDPE	**High Density Polyethylene (HDPE).** HDPE is used to make many types of bottles. Unpigmented bottles are translucent, have good barrier properties and stiffness, and are well suited to packaging products with a short shelf life such as milk. Because HDPE has good chemical resistance, it is used for packaging many household and industrial chemicals such as detergents and bleach. Pigmented HDPE bottles have better stress crack resistance than unpigmented HDPE.	• Excellent resistance to most solvents • Higher tensile strength compared to other forms of polyethylene • Relatively stiff material with useful temperature capabilities	Bottles for milk, water, juice, cosmetics, shampoo, dish and laundry detergents, and household cleaners. Bags for groceries and retail purchases. Cereal box liners. Reusable shipping containers. In addition to packaging, HDPE's major uses are in injection molding applications, extruded pipe and conduit, plastic wood composites, and wire and cable covering.	Bottles for non-food items, such as shampoo, conditioner, liquid laundry detergent, household cleaners, motor oil and antifreeze. Plastic lumber for outdoor decking, fencing and picnic tables. Pipe, floor tiles, buckets, crates, flower pots, garden edging, film and sheet, and recycling bins.

Resin Codes	Descriptions	Properties	Product Applications	Products Made with Recycled Content*
3 PVC	**Polyvinyl Chloride (PVC, Vinyl).** In addition to its stable physical properties, PVC has good chemical resistance, weatherability, flow characteristics and stable electrical properties. The diverse slate of vinyl products can be broadly divided into rigid and flexible materials.	• High impact strength, brilliant clarity, excellent processing performance • Resistance to grease, oil and chemicals	Rigid packaging applications include blister packs and clamshells. Flexible packaging uses include bags for bedding and medical, shrink wrap, deli and meet wrap and tamper resistance. In addition to packaging, PVC's major uses are rigid applications such as pipe, siding, window frames, fencing, decking and railing. Flexible applications include medical products such as blood bags and medical tubing, wire and cable insulation, carpet backing, and flooring.	Pipe, decking, fencing, paneling, gutters, carpet backing, floor tiles and mats, resilient flooring, mud flaps, cassette trays, electrical boxes, cables, traffic cones, garden hose, and mobile home skirting. Packaging, film and sheet, and loose-leaf binders.
4 LDPE	**Low Density Polyethylene (LDPE).** LDPE is used predominately in film applications due to its toughness, flexibility and relative transparency, making it popular for use in applications where heat sealing is necessary. LDPE also is used to manufacture some flexible lids and bottles as well as in wire and cable applications. Includes Linear Low Density Polyethylene (LLDPE).	• Excellent resistance to acids, bases and vegetable oils • Toughness, flexibility and relative transparency (good combination of properties for packaging applications requiring heat-sealing)	Bags for dry cleaning, newspapers, bread, frozen foods, fresh produce, and household garbage. Shrink wrap and stretch film. Coatings for paper milk cartons and hot and cold beverage cups. Container lids. Toys. Squeezable bottles (e.g., honey and mustard). In addition to packaging, LDPE's major uses are in injection molding applications, adhesives and sealants, and wire and cable coverings.	Shipping envelopes, garbage can liners, floor tile, paneling, furniture, film and sheet, compost bins, trash cans, landscape timber, and outdoor lumber.
5 PP	**Polypropylene (PP).** PP has good chemical resistance, is strong, and has a high melting point making it good for hot-fill liquids. This resin is found in flexible and rigid packaging, fibers, and large molded parts for automotive and consumer products.	• Excellent optical clarity in biaxially oriented films and stretch blow molded containers • Low moisture vapor transmission • Inertness toward	Containers for yogurt, margarine, takeout meals, and deli foods. Medicine bottles. Bottle caps and closures. Bottles for catsup and syrup. In addition to packaging, PP's major uses are in fibers, appliances and	Automobile applications, such as battery cases, signal lights, battery cables, brooms and brushes, ice scrapers, oil funnels, and bicycle racks. Garden rakes, storage bins, shipping pallets, sheeting, trays.

Resin Codes	Descriptions	Properties	Product Applications	Products Made with Recycled Content*
		acids, alkalis and most solvents	consumer products, including durable applications such as automotive and carpeting.	
6 PS	**Polystyrene (PS).** PS is a versatile plastic that can be rigid or foamed. General purpose polystyrene is clear, hard and brittle. It has a relatively low melting point. Typical applications include protective packaging, foodservice packaging, bottles, and food containers. PS is often combined with rubber to make high impact polystyrene (HIPS) which is used for packaging and durable applications requiring toughness, but not clarity.	• Excellent moisture barrier for short shelf life products • Excellent optical clarity in general purpose form • Significant stiffness in both foamed and rigid forms. • Low density and high stiffness in foamed applications • Low thermal conductivity and excellent insulation properties in foamed form	Food service items, such as cups, plates, bowls, cutlery, hinged takeout containers (clamshells), meat and poultry trays, and rigid food containers (e.g., yogurt). These items may be made with foamed or non-foamed PS. Protective foam packaging for furniture, electronics and other delicate items. Packing peanuts, known as "loose fill." Compact disc cases and aspirin bottles. In addition to packaging, PS's major uses are in agricultural trays, electronic housings, cable spools, building insulation, video cassette cartridges, coat hangers, and medical products and toys.	Thermal insulation, thermometers, light switch plates, vents, desk trays, rulers, and license plate frames. Cameras or video cassette casings. Foamed foodservice applications, such as egg shell cartons. Plastic mouldings (i.e., wood replacement products). Expandable polystyrene (EPS) foam protective packaging.
7 OTHER	**Other.** Use of this code indicates that a package is made with a resin other than the six listed above, or is made of more than one resin and used in a multi-layer combination.	Dependent on resin or combination of resins	Three- and five-gallon reusable water bottles, some citrus juice and catsup bottles. Oven-baking bags, barrier layers, and custom packaging.	Bottles and plastic lumber applications.

***Recycling may not be available in all areas. Check to see if plastics recycling is available in your community.**

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American Chemistry Council, Plastics Division
Last Updated: March 2007

Appendix C

Listing of 2007 reports from municipal recycling programs

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total Tons	Population
Abbot	0	0	0	**0**	630
Albion	2.41	0	0	**2.41**	1946
Alfred	5.8	0	0	**5.8**	2497
Alton	0	0	0	**0**	816
Andover	0	0	0.25	**0.25**	864
Anson	0	0	6.2	**6.2**	2583
AROOSTOOK VALLEY	3.75	0	0	**3.75**	1871
Arrowsic	0	0	0	**0**	477
Arundel	0	0	31.87	**31.87**	3571
Athens	0	0	0	**0**	847
Auburn	14	0	0	**14**	23203
BAILEYVILLE REGION	1.5	0	0	**1.5**	3697
Bancroft	0	0	0	**0**	61
Bangor	0	0	23.94	**23.94**	31473
Bar Harbor	5.63	0	0	**5.63**	4820
Bath	0	0	15	**15**	9266
Belfast	5	0	0	**5**	6381
Belgrade	5.92	1.41	0	**7.33**	2978
Belmont	0.4	0	0	**0.4**	821
Berwick	0	0	0	**0**	6353
Bethel	0	0	3.92	**3.92**	3027
Biddeford	5	4	8	**17**	20942
Bingham	0	0	0	**0**	989
BLUE HILL REGION	8.54	0	0	**8.54**	6605
BOOTHBAY REGION	14.83	0	0	**14.83**	7068
Bowdoin	2.54	0	0	**2.54**	2727
Bowdoinham	10.59	0	0	**10.59**	2612
Bradley	0.64	0	0	**0.64**	1242
Brewer	5.95	0	0	**5.95**	8987
Bridgton	11.48	3.44	1.82	**16.74**	4883
BRISTOL REGION	5	3	0	**8**	3541
Brooks	0.28	0.12	0.59	**0.99**	1022
Brownfield	0	0	1.37	**1.37**	1251
Brunswick	0	0	20	**20**	21172
BUCKFIELD REGION	0	0	0	**0**	2577
BUCKSPORT REGION	0	0	30	**30**	7042
BURLINGTON-LOWELL	0	1	1	**2**	642
Burnham	0	0	0	**0**	1142
Buxton	9.68	0	0	**9.68**	7452
Calais	2	0	0	**2**	3447
Canaan	5.03	0	0	**5.03**	2017
Canton	2.14	0	0	**2.14**	1121
Cape Elizabeth					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	22.72	0	0	**22.72**	9068
CARATUNK REGION	0	0	2	**2**	190
Casco	4.62	0	0	**4.62**	3469
Castine	2.79	0	0	**2.79**	1343
CENTRAL PENOBSCOT	2.35	0	0	**2.35**	5094
CHERRYFIELD REGION	0.85	0	0	**0.85**	1235
Chester	0	0	0	**0**	525
Chesterville	1.61	0	0	**1.61**	1170
China	4.09	0	0	**4.09**	4106
Clifton	0	0	0	**0**	743
CLINTON REGION	4.6	0	0	**4.6**	5897
Cornish	0.4	0	0	**0.4**	1269
Cranberry Isles	0.47	0	0	**0.47**	128
Cumberland	22.82	0	0	**22.82**	7159
Danforth	0	0	0.75	**0.75**	629
Dayton	0	0	0	**0**	1805
Dedham	0	0	1.51	**1.51**	1422
Deer Isle	0	13.28	0	**13.28**	1876
Denmark	2.16	0	0	**2.16**	1004
Detroit	0	0	5.31	**5.31**	816
Dixmont	0.61	0.12	0	**0.73**	1065
DOVER-FOXCROFT REGI(	11.46	1.09	0	**12.55**	6539
Dresden	7.51	0	0	**7.51**	1625
Durham	7.2	0	0	**7.2**	3381
E. Millinocket	2.6	0	1.38	**3.98**	1828
Eastport	0	0	2	**2**	1640
Eliot	12	2	0	**14**	5954
ELLSWORTH AREA	9	0	0	**9**	6594
Enfield	2.8	0	0	**2.8**	1616
EUSTIS REGION	2.62	0	0	**2.62**	890
Falmouth	45.8	0	0	**45.8**	10310
Farmington	12.7	0	0	**12.7**	7410
Fayette	0.88	0	0	**0.88**	1040
Franklin	1.8	0.28	0	**2.08**	1370
Freedom	0.37	0.07	0	**0.44**	645
Freeport	0	0	15.41	**15.41**	7800
Frye Island	0	0	0	**0**	70
Fryeburg	2.53	2.78	3.18	**8.49**	3083
Garland	1.21	0	0	**1.21**	990
Georgetown	3.4	0	0	**3.4**	1020
Gilead	0.37	0	0	**0.37**	156
Glenburn	1.6	0	0	**1.6**	3964
Gorham					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	0	0	36.33	**36.33**	14141
Gouldsboro	2.6	0.26	0	**2.86**	1941
Gray	19	0	15	**34**	6820
Greene	0	0	0	**0**	4076
GREENWOOD WOODSTO	3.66	2	0	**5.66**	2109
Hampden	7.4	0	0	**7.4**	6327
Hancock	2.9	0.29	0	**3.19**	2147
HARMONY REGION	0	0	0	**0**	1212
Harpswell	6.74	1.49	7.13	**15.36**	5239
Harrington	0	0	0.3	**0.3**	882
Harrison	0	0	2.81	**2.81**	2315
Hartford	2.12	2.2	0	**4.32**	963
Hartland	4.44	0	0	**4.44**	1816
HATCH HILL REGION	15	0	0	**15**	41785
Haynesville	0	0	0	**0**	122
Hebron	2.27	0	0	**2.27**	1053
Hermon	0.72	0	0	**0.72**	4437
Holden	4.66	0	0	**4.66**	2827
Hollis	6.84	0	0	**6.84**	4114
Howland	2.5	0.2	1.75	**4.45**	1362
Hudson	1.6	0	0	**1.6**	1393
Indian Township	0	0	0	**0**	676
Industry	1.5	0	0	**1.5**	790
Isle Au Haut	0	0	0	**0**	79
Islesboro	1.18	0	0	**1.18**	603
JACKMAN REGION	0.69	0	0	**0.69**	1321
Jackson	0.16	0.06	0.14	**0.36**	506
Jay	13.57	0	0	**13.57**	4985
Kenduskeag	0.55	0	0	**0.55**	1171
Kennebunkport	0	0	0	**0**	3720
KINGFIELD REGION	6.27	0	0	**6.27**	2507
Kittery	0	30	0	**30**	9543
Knox	0.43	0.09	0	**0.52**	747
Lagrange	0	0	0	**0**	747
Lakeville	0	0	0	**0**	63
Lamoine	4.45	0	0	**4.45**	1495
Lebanon	0	0	0	**0**	5083
Lee	0	0	0	**0**	845
Leeds	2.07	0	0	**2.07**	2001
Levant	1.02	0	0	**1.02**	2171
Lewiston	54.9	0	0	**54.9**	35690
Limerick	0	0	27.84	**27.84**	2240
Limington					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	0	0	2.45	**2.45**	3403
Lincoln	0	0	2	**2**	5221
Lincoln Plt.	0.22	0	0	**0.22**	46
Lisbon	16.3	0	6.63	**22.93**	9077
Litchfield	0	0	0	**0**	3110
Littleton	0	0	0	**0**	955
Livermore	4.64	0	0	**4.64**	2106
Livermore Falls	9.19	0	0	**9.19**	3227
Long Island	0.94	0	0	**0.94**	202
LOVELL REGION	5.2	0	0	**5.2**	1262
Lubec	2.24	0	0	**2.24**	1652
Lyman	0	0	0	**0**	3795
MACHIAS REGION	10.62	0	0	**10.62**	3360
Macwahoc Plt.	0	0	0	**0**	98
Madison	10	0	0	**10**	4523
Magalloway Plt.	0	0	0	**0**	37
Mariaville	0.25	0	0	**0.25**	414
MARION TS	0	0	0	**0**	7713
MARS HILL AREA	3.88	0	0	**3.88**	1484
Mattawamkeag	0.95	0.95	0	**1.9**	825
Maxfield	0	0	0	**0**	87
Mechanic Falls	5.28	0	0	**5.28**	3138
Medford	0	0	0	**0**	231
MEDWAY REGION	1	0	2.6	**3.6**	1775
Mercer	0.71	0	0	**0.71**	647
MID-COAST	29	0	0	**29**	11890
MID-MAINE	15.75	0	0	**15.75**	9812
Milbridge	7.5	0	0	**7.5**	1279
Milford	1.37	0	0	**1.37**	2950
Millinocket	8	0	0	**8**	5203
Minot	0	0	0	**0**	2248
MONMOUTH REGION	6	2	0	**8**	4850
MONSON REGION	0	0	0	**0**	749
Montville	0.58	0.12	0	**0.7**	1002
Morrill	0	0	0	**0**	774
Moscow	0	0	0.9	**0.9**	577
Mount Desert	2.52	0	0	**2.52**	2109
Mount Vernon	2.95	0	0	**2.95**	1524
Naples	5.65	0	0	**5.65**	3274
New Gloucester	8.7	0	0	**8.7**	4803
New Sharon	1.53	0	0	**1.53**	1297
New Vineyard	0	0	0.95	**0.95**	725
Newburgh					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	0.5	0	0	**0.5**	1394
Newfield	0	0	0	**0**	1328
Newport	10	0	0	**10**	3017
No. Yarmouth	0	0	5.62	**5.62**	3210
NOBLEBORO REGION	13.9	0	0	**13.9**	8585
Norridgewock	0	0	0	**0**	3294
North Berwick	0	0	15.42	**15.42**	4293
North Haven	0.15	0	0	**0.15**	381
NORTH OXFORD REGION	30.5	0	0	**30.5**	13965
NORTHERN AROOSTOOK	15.9	0	12.8	**28.7**	10794
NORTHERN KATAHDIN VA	4.5	0	0	**4.5**	4340
NORWAY PARIS	21.97	0	0	**21.97**	9404
Oakland	6.89	0.42	0	**7.31**	5959
Ogunquit	3.84	1.74	3.43	**9.01**	1226
Old Orchard Beach	0	0	0	**0**	8856
Old Town	9.54	0	0	**9.54**	8130
Orient	0	0	0	**0**	145
Orrington	2.15	0	0	**2.15**	3526
Otisfield	2.71	0	0	**2.71**	1560
Oxford	6	0	0	**6**	3960
Palmyra	5.9	1.39	0	**7.29**	1953
Parkman	0	0	1.22	**1.22**	811
Parsonsfield	2.4	0	0	**2.4**	1584
Passadumkeag	2	0	0	**2**	441
Penobscot	0	0	0.92	**0.92**	1344
PENOBSCOT COUNTY	0	0	1	**1**	1447
PENQUIS SOLID WASTE C	0	0	0	**0**	1259
Phippsburg	0	0	25.3	**25.3**	2106
PISCATAQUIS COUNTY	0.33	0.17	0	**0.5**	601
Pittsfield	43.2	36.35	4.33	**83.88**	4214
Plymouth	5.03	1.67	0	**6.7**	1257
Poland	0	0	0	**0**	4866
Portland	0	0	143	**143**	64249
Pownal	0	0	2.96	**2.96**	1491
PRESQUE ISLE REGION	10.68	2.45	0	**13.13**	14630
Princeton	0	0	0	**0**	892
Prospect	0.32	0	0	**0.32**	642
RANGELEY REGION	2.74	0	0	**2.74**	1302
Raymond	0	0	0	**0**	4299
Reed Plt.	0	0	0	**0**	207
Richmond	1	0.5	0	**1.5**	3298
Rockland	16.45	0	0	**16.45**	7609
Rome					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008 Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	0	0	0	**0**	980
Sabattus	13	3	0	**16**	4486
Saco	0	0	0	**0**	16822
Sanford	13.41	0	0	**13.41**	20806
Scarborough	0	0	74.87	**74.87**	16970
Searsmont	1.51	0	0	**1.51**	1174
Searsport	0	0	0	**0**	2641
Sebago	0	0	0	**0**	1433
Shapleigh	0	0	0	**0**	2326
SHERMAN REGION	12	0	0	**12**	1828
Sidney	5.81	0	0	**5.81**	3514
Skowhegan	11.78	0	0	**11.78**	8824
Smithfield	0	0	0	**0**	930
Solon	7.22	0	0	**7.22**	940
Sorrento	0	0	0.44	**0.44**	290
SOUTH AROOSTOOK REG	17.38	0	0	**17.38**	11144
South Berwick	0	0	36.62	**36.62**	6671
South Portland	0	0	54.26	**54.26**	23324
Southwest Harbor	4.37	0	0	**4.37**	1966
Springfield	0	0	0	**0**	379
St. George	6.25	0.74	19.09	**26.08**	2580
Standish	0	0	15.57	**15.57**	9285
Starks	1.1	0.9	0	**2**	578
Stetson	0.7	0	0	**0.7**	981
Stockton Springs	0.99	0	0	**0.99**	1481
Stonington	2.25	0	0	**2.25**	1152
Strong	0	0	0.48	**0.48**	1259
Sullivan	0	0	1.76	**1.76**	1185
Swanville	1.32	0	0	**1.32**	1357
Sweden	0	0	0	**0**	324
Temple	0.58	0	0	**0.58**	572
THOMASTON REGION	0	0	0	**0**	6765
Thorndike	0.5	0.1	0	**0.6**	712
Topsham	17.14	0	0	**17.14**	9100
Tremont	2.46	0	0	**2.46**	1529
Trenton	1.28	0	0	**1.28**	1370
TRI-COMMUNITY	16	175	8	**199**	24306
TRI-COUNTY	14.4	0	0	**14.4**	7481
TRI-TOWN	0	0	3.52	**3.52**	4151
Troy	0.3	0.11	0.26	**0.67**	963
Turner	8.69	0	0	**8.69**	4972
Unity	1.89	1.5	6.5	**9.89**	1889
Van Buren					

2007 Plastic Recycling Efforts as Reported to the State Planning Office

12/31/2008

Rpt: Plasticreport08
View: TFacWk1

	HDPE Plastic	PET Plastic	Other Plastics	Total	Population
	15	6	0	**21**	2631
Vassalboro	3.88	0	0	**3.88**	4047
Verona	0	0	0	**0**	533
Vienna	0.66	0	0	**0.66**	527
Vinalhaven	5.93	0	0	**5.93**	1235
WALDOBORO REGION	11.8	0	0	**11.8**	7442
Warren	4.03	2.39	0	**6.42**	3794
Waterboro	0	0	0	**0**	6214
Waterville	0	0	45	**45**	15605
Weld	0	0	1.24	**1.24**	402
Wells	0	0	0	**0**	9400
West Bath	0	0	0	**0**	1798
West Gardiner	0	0	3.96	**3.96**	2902
West Paris	2.99	0	0	**2.99**	1722
Westbrook	0	0	0	**0**	16142
Weston	0	0	0	**0**	203
Willimantic	0.35	0	0	**0.35**	135
WILTON AREA	20.64	0	0	**20.64**	4193
Windham	39.66	0	0	**39.66**	14904
Windsor	3.5	0	2.8	**6.3**	2204
Winn	0	0	1.5	**1.5**	420
Winslow	0	0	0	**0**	7743
Winter Harbor	0	0	0.7	**0.7**	500
Winterport	5.29	0	0	**5.29**	3602
Winthrop	27.61	0	0	**27.61**	6232
WISCASSET REGION	5.9	5.6	4.6	**16.1**	5023
Woolwich	0	0	0	**0**	2810
Yarmouth	0	0	18.36	**18.36**	8360
York	0	0	0	**0**	12854
	1,182.43	**312.28**	**797.86**	**2,292.57**	

Population of this Group: 1,205,005

Percent of 2000 US Census: 94.52 %

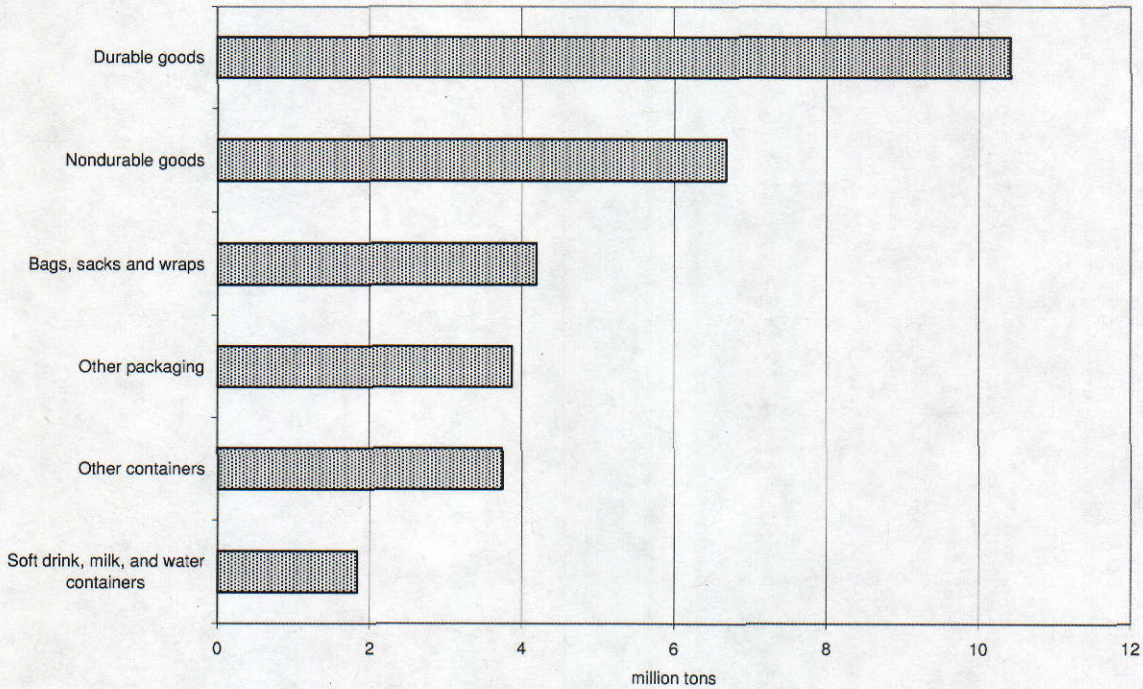
Appendix D

2007 Characterization of Municipal Solid Waste
(United States Environmental Protection Agency)

Plastics

Plastics are a rapidly growing segment of MSW. While plastics are found in all major MSW categories, the containers and packaging category (bags, sacks, and wraps, other packaging, other containers, and soft drink, milk, and water containers) has the most plastic tonnage (Figure 8 and Table 7).

Figure 8. Plastics products generated in MSW, 2007



In durable goods, plastics are found in appliances, furniture, casings of lead-acid batteries, and other products. (Note that plastics in transportation products other than lead-acid batteries are not included in this report.) As shown in Table 7, a wide range of resin types is found in durable goods. While some detail is provided in Table 7 for resins in durable goods, there are hundreds of different resin formulations used in appliances, carpets, and other durable goods; a complete listing is beyond the scope of this report.

Table 7

PLASTICS IN PRODUCTS IN MSW, 2007
(In thousands of tons, and percent of generation by resin)

Product Category	Generation (Thousand tons)	Recovery (Thousand tons)	Recovery (Percent of Gen.)	Discards (Thousand tons)
Durable Goods				
PET	570			
HDPE	780			
PVC	620			
LDPE/LLDPE	920			
PP	1,630			
PS	890			
Other resins	5,010			
Total Plastics in Durable Goods	**10,420**	**500**	**4.8%**	**9,920**
Nondurable Goods				
Plastic Plates and Cups				
LDPE/LLDPE	20			20
PS	840	Neg.		840
Subtotal Plastic Plates and Cups	860			860
Trash Bags				
HDPE	290			290
LDPE/LLDPE	780			780
Subtotal Trash Bags	1,070			1,070
All other nondurables*				
PET	230			230
HDPE	430			430
PVC	630			630
LDPE/LLDPE	1,680			1,680
PP	900			900
PS	590			590
Other resins	290			290
Subtotal All Other Nondurables	4,750			4,750
Total Plastics in Nondurable Goods, by resin				
PET	230			230
HDPE	720			720
PVC	630			630
LDPE/LLDPE	2,480			2,480
PP	900			900
PS	1,430			1,430
Other resins	290			290
Total Plastics in Nondurable Goods	**6,680**	**Neg.**	**Neg.**	**6,680**
Plastic Containers & Packaging				
Soft drink bottles				
PET	1,010	370	36.6%	640
Milk and water bottles				
HDPE	820	230	28.0%	590

HDPE = High density polyethylene PET = Polyethylene terephthalate PS = Polystyrene
LDPE = Low density polyethylene PP = Polypropylene PVC = Polyvinyl chloride
LLDPE = Linear low density polyethylene

* All other nondurables include plastics in disposable diapers, clothing, footwear, etc.

** Other plastic packaging includes coatings, closures, caps, trays, shapes, etc.

Details may not add to totals due to rounding. Neg. = less than 5,000 tons or 0.05 percent

Source: Franklin Associates, A Division of ERG

Table 7 (continued)
PLASTICS IN PRODUCTS IN MSW, 2007
(In thousands of tons, and percent of generation by resin)

Product Category	Generation (Thousand tons)	Recovery (Thousand tons)	Recovery (Percent of Gen.)	Discards (Thousand tons)
Plastic Containers & Packaging, cont.				
Other plastic containers				
PET	1,730	270	15.6%	1,460
HDPE	1,410	240	17.0%	1,170
PVC	60	Neg.		60
LDPE/LLDPE	40	Neg.		40
PP	420	10	2.4%	410
PS	0			0
Other resins	80			80
Subtotal Other Containers	**3,740**	**520**	**13.9%**	**3,220**
Bags, sacks, & wraps				
HDPE	590	70	11.9%	520
PVC	80			80
LDPE/LLDPE	2,490	310	12.4%	2,180
PP	800			800
PS	0			0
Other resins	230			230
Subtotal Bags, Sacks, & Wraps	**4,190**	**380**	**9.1%**	**3,810**
Other Plastics Packaging**				
PET	220	40	18.2%	180
HDPE	1,330	30	2.3%	1,300
PVC	270	Neg.		270
LDPE/LLDPE	470	Neg.		470
PP	820	Neg.		820
PS	300	20	6.7%	280
Other resins	460			460
Subtotal Other Packaging	**3,870**	**90**	**2.3%**	**3,780**
Total Plastics in Containers & Packaging, by resin				
PET	2,960	680	23.0%	2,280
HDPE	4,150	570	13.7%	3,580
PVC	410			410
LDPE/LLDPE	3,000	310	10.3%	2,690
PP	2,040	10	0.5%	2,030
PS	300	20	6.7%	280
Other resins	770			770
Total Plastics in Cont. & Packaging	**13,630**	**1,590**	**11.7%**	**12,040**
Total Plastics in MSW, by resin				
PET	3,760	680	18.1%	3,080
HDPE	5,650	570	10.1%	5,080
PVC	1,660			1,660
LDPE/LLDPE	6,400	310	4.8%	6,090
PP	4,570	10	0.2%	4,560
PS	2,620	20	0.8%	2,600
Other resins	6,070	500	8.2%	5,570
Total Plastics in MSW	**30,730**	**2,090**	**6.8%**	**28,640**

HDPE = High density polyethylene PET = Polyethylene terephthalate PS = Polystyrene
LDPE = Low density polyethylene PP = Polypropylene PVC = Polyvinyl chloride
LLDPE = Linear low density polyethylene

* All other nondurables include plastics in disposable diapers, clothing, footwear, etc.
** Other plastic packaging includes coatings, closures, caps, trays, shapes, etc.
Some detail of recovery by resin omitted due to lack of data. Neg. = less than 5,000 tons or 0.05 percent

Source: Franklin Associates, A Division of ERG

Plastics are found in such nondurable products as disposable diapers, trash bags, cups, eating utensils, medical devices, and household items such as shower curtains. The plastic food service items are generally made of clear or foamed polystyrene, while trash bags are made of high-density polyethylene (HDPE) or low-density polyethylene (LDPE). A wide variety of other resins are used in other nondurable goods.

Plastic resins are also used in a variety of container and packaging products such as polyethylene terephthalate (PET) soft drink bottles, high-density polyethylene (HDPE) bottles for milk and water, and a wide variety of other resin types used in other plastic containers, bags, sacks, wraps, and lids.

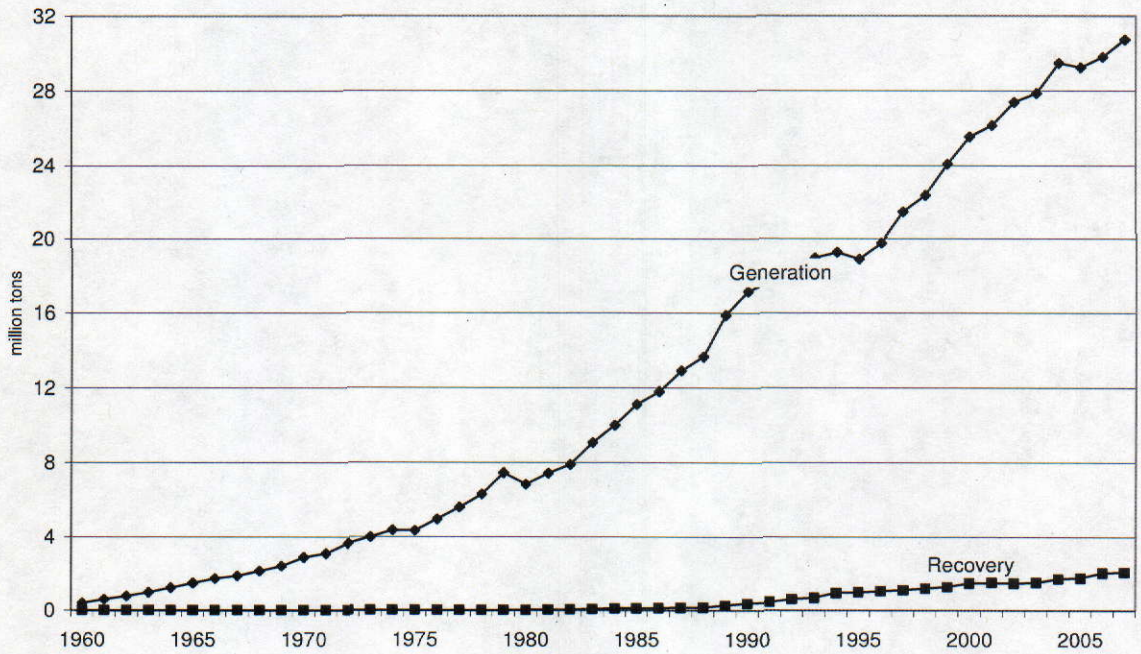
Generation. Production data on plastics resin use in products are taken from the American Chemistry Council's annual resin reports. The basic data are adjusted for product service life, fabrication losses, and net imports of plastic products to derive generation of plastics in the various products in MSW.

Plastics made up an estimated 390,000 tons of MSW generation in 1960. The quantity has increased relatively steadily to 30.7 million tons in 2007 (Figure 9). As a percentage of MSW generation, plastics were less than one percent in 1960, increasing to 12.1 percent in 2007.

Recovery for Recycling. While overall recovery of plastics for recycling is relatively small – 2.1 million tons, or 6.8 percent of plastics generation in 2007 (Table 7) – recovery of some plastic containers is more significant. PET soft drink bottles (including water bottles) were recovered at a rate of 36.6 percent in 2007. Recovery of high-density polyethylene milk and water bottles was estimated at about 28.0 percent in 2007. Significant recovery of plastics from lead-acid battery casings and from some other containers was also reported. The primary sources of data on plastics recovery are annual product recovery surveys conducted for the American Chemistry Council and the National Association for PET Container Resources (NAPCOR).

Discards After Recovery. Discards of plastics in MSW after recovery were 28.6 million tons, or 16.9 percent of total MSW discards in 2007 (Table 3).

Figure 9. Plastics generation and recovery, 1960 to 2007



Other Materials

Rubber and Leather. The predominant source of rubber in MSW is rubber tires from automobiles and trucks (Table 8). Other sources of rubber and leather include clothing and footwear and other miscellaneous durable and nondurable products. These other sources are quite diverse, including such items as gaskets on appliances, furniture, and hot water bottles, for example.

Appendix E

Plastic resin market specifications and information

HAYCORE
CANADA INC.

Post Consumer Un-pigmented (Natural) HDPE Specifications

ACCEPTABLE MATERIALS – HDPE natural

- Curb-side plastics HDPE bottles number 2 (small neck only. i.e. Milk, water, and juice (quart, ½ gallon, and 1 gallon bottles))

ALLOWABLE LEVELS OF CONTAMINANTS

- Maximum waste is not to exceed 2% of total content (no PET, PVC, PP, Aluminium, tin food cans or beverage container, paper, cardboard or film)
- No moisture – dry bales only
- Maximum waste is to not exceed 2% of total content (no PET, PVC, film or pails)
- No trash, food, or paper inside bales (labels are acceptable)
- No hazardous material, medical waste
- No steel or aluminium
- No pails
- No industrial HDPE

BALE SIZE / MARKINGS

- Bale size 24 x 36 x 42 minimum to 36 x 48 x 72 maximum
- Bale weight 250 kg minimum to 500 kg maximum
- Truckload shipments only
- Bill of lading to list supplier's name and Haycore's reference number

PROHIBITED MATERIALS

- Bales containing hazardous product containers
- Bales containing medical waste such as IV bags and needles / syringes
- Bales containing other materials that would be dangerous or damaging to process

COMMENTS

A positive sort and a good faith effort to eliminate all forms of waste and contamination will ensure stable markets for this grade of material.

Head Office
3144 Gregoire Road
Russell, Ontario K4R 1E5
(613) 445-3610 fax (613) 445-0247

Processing Facility
9 Newport Drive
Prescott, Ontario K0E 1T0
(613) 925-0005

HAYCORE
CANADA INC

Post Consumer HDPE Specifications

ACCEPTABLE MATERIALS – HDPE color

- Curb-side plastics HDPE bottles number 2 (small neck only)

ALLOWABLE LEVELS OF CONTAMINANTS

- Maximum waste is not to exceed 2% of total content (no PET, PVC, PP, Aluminium, tin food cans or beverage container, paper, cardboard or film)
- No moisture – dry bales only
- No trash, food, or paper inside bales (labels are acceptable)
- No steel or aluminium
- No pails
- No industrial HDPE

BALE SIZE / MARKINGS

- Bale size 24 x 36 x 42 minimum to 36 x 48 x 72 maximum
- Bale weight 250 kg minimum to 500 kg maximum
- Truckload shipments only
- Bill of lading to list supplier's name and Haycore's reference number

PROHIBITED MATERIALS

- Bales containing hazardous product containers
- Bales containing medical waste such as IV bags and needles / syringes
- Bales containing other materials that would be dangerous or damaging to process

COMMENTS

A good faith effort to eliminate all forms of waste and contamination will ensure stable markets for this grade of material.

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HAYCORE CANADA INC.

Post Consumer Mixed Plastics #1 Through #7

ACCEPTABLE MATERIALS – Mixed Plastic 1 - 7

- Curb-side plastics #1 through #7
- Must contain # 1 and # 2

ALLOWABLE LEVELS OF CONTAMINANTS

- No moisture – dry bales only
- Maximum waste is to not exceed 5% of total content
- Waste defined as #3-7 plastics, paper, metal or glass
- No trash, food, or paper inside bales (labels are acceptable)
- No hazardous material, medical waste

BALE SIZE / MARKINGS

- Bale size 24 x 36 x 42 minimum to 36 x 48 x 72 maximum
- Bale weight 250 kg minimum to 500 kg maximum
- Truckload shipments only
- Bill of lading to list supplier's name and Haycore's reference number

PROHIBITED MATERIALS

- Bales containing hazardous product containers
- Bales containing medical waste such as IV bags and needles / syringes
- Bales containing other materials that would be dangerous or damaging to process

COMMENTS

A good faith effort to eliminate all forms of waste and contamination will ensure stable markets for this grade of material.

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Prescott, Ontario K0E 1T0
(613) 925-0005

HAYCORE CANADA INC.

Grocery Bags Specifications

ACCEPTABLE MATERIALS

- Grocery bags

ALLOWABLE LEVELS OF CONTAMINANTS

- Maximum waste is not to exceed 2% of contamination.

BALE SIZE / MARKINGS

- Bale size 24 x 36 x 42 minimum to 36 x 48 x 72 maximum
- Bale weight 250 kg minimum to 500 kg maximum
- Truckload shipments only
- Bill of lading to list supplier's name and Haycore's reference number

PROHIBITED MATERIALS

- Bales containing hazardous product containers
- Bales containing medical waste such as IV bags and needles / syringes
- Bales containing other materials that would be dangerous or damaging to process
- Bales must be dry

COMMENTS

A positive sort and a good faith effort to eliminate all forms of waste and contamination will ensure stable markets for this grade of material.

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(613) 925-0005

Once delivered to Mondo Polymers facility, the material is then processed and converted to highway department-approved guard rail spacer blocks. Approximately 21,000 blocks were constructed thanks to this 2006 recycling effort from plastic that has been land-filled in the past.

Is boat shrink-wrap filling your trash dumpsters?

Boat shrink-wrap is made of low-density polyethylene (LDPE), which can be recycled and used in the manufacture of new products such as plastic bags, guard rail blocks, wheel chalks, lawn edging, plastic banners, plastic lumber (decking, benches, etc.), and more!

Would your marina like to participate in a program to recycle that material?

In 2007, the boat shrink-wrap program will be expanded to include the entire Lake Erie coastline. Marinas, yacht clubs, dry marinas and boat storage yards can coordinate pick-up schedules to accommodate large and small quantity clients.

To find out how to participate, visit: ***ohiocleanmarina.osu.edu*** or contact Gary Comer, Jr. at *comer.29@osu*.edu or 419.609.4120.

Contact:

Gary L. Comer Jr., Ohio Clean Marinas Coordinator
Ohio Sea Grant Extension
105 West Shoreline Drive
Sandusky, Ohio 44870
comer.29@osu.edu
419.609.4120

David Kelch, Ohio Clean Marinas Program Administrator
Ohio Sea Grant Extension
42110 Russia Road
Elyria, Ohio 44035
kelch.3@osu.edu
440.326.5851

Ronnie Wesel
Mondo Polymers
Technologies, Inc.
State Route 7, P.O. Box 250
Reno, Ohio 45773
ron@mondopolymer.com
740.376.9396

The Ohio Clean Marinas Program is a proactive partnership among the Ohio Sea Grant College Program, Ohio Department of Natural Resources, Lake Erie Marine Trades Association, and other public and private sector partners that are connected to Ohio's recreational boating industry. The program is designed to encourage marinas and boaters to use simple, innovative solutions to keep Ohio's coastal and inland waterway resources clean. The Ohio Clean Marinas Program assists these operators in protecting the resources that provide their livelihood - clean water and fresh air.

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ohiocleanmarina.osu.edu

The Boat Shrink-Wrap Recycling Program

Ohio Clean Marina

MONDO Polymer Technologies

The Boat Shrink-Wrap Recycling Program

In the spring of 2006, the Ohio Clean Marinas Program, in partnership with Mondo Polymer Technologies, Inc. completed the first year of a two-year pilot program, offering marina operators and boaters a welcomed cost effective alternative to recycle boat shrink-wrap.

The program provided a no-cost shrink-wrap collection service once every two weeks for more than 50 marinas located in Erie, Ottawa, and Lorain counties. In addition, scheduled pick-ups occurred at 20 marinas located in Lucas, Cuyahoga, and Lake counties by appointment.

Thanks to this program, more than 50 tons of boat shrink-wrap and more than 23 tons of greenhouse plastics were recycled into approximately 21,000 polymer guardrail blocks.

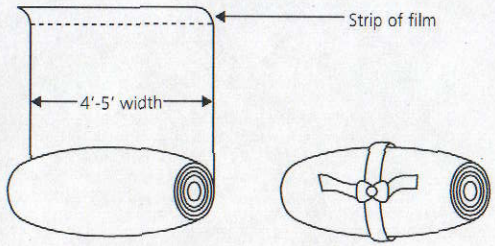
Packer truck used by Mondo Polymers to collect boat shrink-wrap and seasonal nursery plastic. Workers collected between 10,000 -15,000 pounds in a single truck load.

What You Can Do:

1. Remove all lumber, metal zippers, reusable vents, rope, and other non shrink-wrap materials (batteries, soda cans, screws, nails) from the shrink-wrap. The doors and vents may be reusable next year.

2. Keep the shrink-wrap as clean as possible – gravel, sand, and excess dirt make the recycling process more difficult.

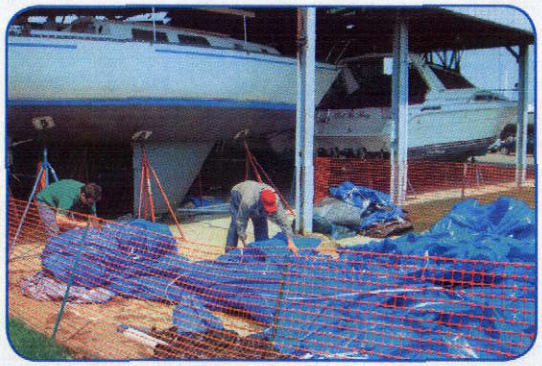
3. Maximize the amount of shrink-wrap that will fit in your storage area and reduce water weight by rolling the shrink-wrap into a bundle up to five feet long, similar to a rolled up sleeping bag. Tie the bundle with a strip of shrink-wrap or ribbon strapping (see diagram below). While rolling, try to keep the shrink-wrap clean.



(1) Fold the film into a width of 4-5 feet, roll the film up and then cut off a strip of film from the end of the roll.

(2) Use the strip of film to tie the bundle.

4. Place rolled shrink-wrap in the designated containers marked "**SHRINK-WRAP ONLY**." Make sure to put only shrink-wrap into the container or storage area. Contaminated and dirty shrink-wrap may disrupt the recycling process decreasing the value of the material.



Marinas temporarily stored shrink wrap material in a variety of cost effective and creative ways.

Bales were loaded on tractor trailers for transport to Mondo Polymers, Inc. located in Reno, Ohio. Each trailer holds approximately 30,000 pounds or 15 tons of material.