

Appendix

Wisconsin Plastics Recycling Study

Project I.D.: 12W025

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**Wisconsin Department of Natural Resources
(DNR)**

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Appendices

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Appendix - Chapter 2

Background Information and National Trends

2-A State Container Deposit Programs (U.S.)

Bottle Bills in the USA - All US Bottle Bills

State	Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success	History
California	California Beverage Container Recycling and Litter Reduction Act (AB 2020)	Enacted 9/29/1986 Implemented 9/1/1987	Beer, malt, wine & distilled spirits coolers, all non-alcoholic beverages except milk	Aluminum, glass, plastic and bi-metal. Exempts refillables	(10¢: 24oz and greater) and (5¢: under 24oz.)	(Paid by state to supermarket sites, nonprofit convenience zone recyclers, and rural region recyclers.) .859¢	Beverage manufacturers pay Processing Fees to offset recyclers' costs when the cost of recycling exceeds the value of material. Processing Payments paid by state to redemption centers. Processing fees and payments vary by container type.	State certified redemption centers, registered curbside operations, drop-offs	Property of state: used for program administration and grants to non-profits	2011 redemption rates (January–June): Overall 88% aluminum 100%, glass 102% #1 PET 70% #2 HDPE 276% #3 PVC 6% #4 LDPE 1% #5 PP 3% #6 PS 9% #7 other 8% bimetal 16%	Amended in 1990, 2000, 2004, and 2007
	Notes: For sources and references, see the California Quick Facts page. Containers are returned to licensed redemption centers, not to retailers; Refund value determined by weight for more than 50 containers										
Connecticut	Beverage Container Deposit and Redemption Law	Enacted 4/12/78; Implemented 1/1/80	Beer, malt, carbonated soft drinks, and bottled water	Any individual, separate, sealed glass, metal or plastic bottle, can, jar or carton containing a beverage. Excluded are containers over 3L containing noncarbonated	5¢	Beer 1.5¢, other beverages 2¢		Retail stores and redemption centers	Returned to the State	No statistics available	Amended in 1983, 1986, and 2009

State	Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success	History
				beverages, and HDPE containers.							
Notes: For sources and references, see the Connecticut Quick Facts page. "Dislocation fund" for workers who lost their jobs due to bottle bill											
Hawaii	Solid Waste Management; Deposit Beverage Container Law (Act 176)	Enacted 6/25/02, Implemented 1/1/05	All nonalcoholic drinks, except for milk or dairy products, and limited alcoholic drinks (beer, malt beverages, mixed spirits, mixed wine).	Aluminum, bi-metal, glass, plastic (PET and HDPE only) up to 68 oz.	5¢	Variable fee of 2–4¢ paid to redemption centers from the Deposit Beverage Container Fund.	1¢ non-refundable "container fee" (added to price of beverage) paid to fund redemption centers.	Certified Redemption Centers (CRCs) operated by privately owned by State permitted Solid Waste facilities.	Property of state: used for program administration	Redemption rate of 72% in fiscal year 2008 79% as of November 2009	Expanded in 2007
Notes: For sources and references, see the Hawaii Quick Facts page. Redemption centers must submit reports regularly, Refund may be calculated by weight											
Iowa	Beverage Container Deposit Law	Enacted 4/1/78, Implemented 6/2/79	Beer, carbonated soft drinks & mineral water, wine coolers, wine & liquor	Any sealed glass, plastic, or metal bottle, can, jar or carton containing a beverage	5¢	1¢, paid by distributor to retailer or redemption center		Retail stores and redemption centers	Retained by distributor/bottle rs	overall 86%	
Notes: For sources and references, see the Iowa Quick Facts page. Wine/liquor containers included; deposit containers were banned from landfills in 1990; if agreement exists w/licensed center, retailer can refuse containers											
Massachusetts	Beverage Container Recovery Law	Enacted 6/4/81, Implemented 1/1/83	Beer, malt, carbonated soft drinks, & mineral water	Any sealable bottle, can, jar, or carton of glass, metal, plastic, or combo. Excludes biodegradables.	5¢	2.25¢		Retail stores and redemption centers	Property of state general fund	70.8% in Fiscal Year 2010 (July 2009 – June 2010)	Amended in 1990 and 2003
Notes: For sources and references, see the Massachusetts Quick Facts page. Wholesalers must file monthly reports w/Dept. of Revenue re: deposit & refund, Survived repeal by referendum effort in 1982 by a 60% to 40% vote.											

State	Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success	History
Maine	Maine Returnable Beverage Container Law	Enacted 1/12/76, Implemented 6/1/78	All beverages except dairy products and unprocessed cider	All sealed containers made of glass, metal or plastic, containing 4 liters or less, excluding aseptics	Wine/liquor: 15¢ All others: 5¢	4¢ (.5¢ less if part of qualified commingling agreement)		Retail stores and redemption centers; Dealers may refuse if in agreement with a redemption center	Property of state	No statistics available	Amended in 1980, 1990, 1991, 1993, 2003, 2009
	Notes: For sources and references, see the Maine Quick Facts page. Distributors who initiate deposits have the obligation to pick up containers from the dealers they deliver to or from the licensed redemption center that serves those dealers. There is a per container fine of \$100 for tendering containers purchased out of state for redemption.										
Michigan	Michigan Beverage Container Law	Enacted 11/2/76, Implemented 12/3/78	Beer, soft drinks, carbonated & mineral water, wine coolers, canned cocktails	Any airtight metal, glass, paper, or plastic container, or a combination, under one gallon	10¢	None		Retail stores	75% to state for envt'l programs, 25% to retailers	Overall 96.9%	Amended in 1989 and 2008
	Notes: For sources and references, see the Michigan Quick Facts page. Only state with a 10 cent deposit										
New York	New York State Returnable Container Law	Enacted 6/15/82, Implemented 7/1/83	Beer, malt, carbonated soft drinks, water, wine coolers	Airtight metal, glass, paper, plastic, or combination of the above, under one gallon	5¢	3.5¢		Retail stores and redemption centers	80% to the state General Fund; 20% retained by distributor	Overall: 66.8% Beer: 75.2% Soda: 56.8% Wine: 64.7%	Amended in 1983, 1998, and 2009
	Notes: For sources and references, see the New York Quick Facts page. Requires reporting of containers sold and redeemed by bottlers and distributors										
Oregon	The Beverage Container Act	Enacted 7/2/71, Implemented 1/01/72	Beer, malt, carbonated soft drinks, & bottled water (will	Any individual, separate, sealed glass, metal or plastic bottle, can, jar	Standard refillable: 2¢; all others 5¢ (with potential to	none		Retail stores or approved redemption centers	Retained by distributor/bottlers	overall 84%	Expanded 1/1/08, 6/2011

State	Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success	History
			cover all beverages except wine, liquor, milk, and milk substitutes by 2018)	containing a beverage	increase to 10¢)						
Notes: For sources and references, see the Oregon Quick Facts page. Only deposit law without a handling fee.											
Vermont	Beverage Container Law (1972), Solid Waste Act (1987)	Enacted 4/7/72, Implemented 7/1/73	Beer, malt, carbonated soft drinks, mixed wine drinks; liquor	Any bottle, can, jar or carton composed of glass, metal, paper, plastic or any combination (Biodegradables excluded)	Liquor: 15¢ All others: 5¢	4¢ for brand-sorted containers and 3.5¢ for commingled brands		Retail stores and redemption centers, If retailer is located conveniently near a licensed center and thereby gains state approval, retailer may refuse containers	Retained by distributor/bottlers	Overall 85%	Expanded in 1991
Notes: For sources and references, see the Vermont Quick Facts page.											
All States	Notes: Food Stamps: Food stamp benefits can cover the entire cost of items such as eligible drinks in returnable bottles, including the bottle deposit. [a]										
[a] Source: The Food Stamp Program: Training Guide for Retailers. USDA Food and Nutrition Service. December 2002 (http://www.dss.state.va.us/pub/pdf/ebt_retguide.pdf)											

Information provided by: bottlebill.org

2-B Provincial Container Deposit Programs (Canada)

Recycling Legislation in Canada: All Canada Bottle Bills

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Alberta	Beverage Container Recycling Program	Implemented December 1, 1997	All beverages	All sealed containers	Up to 1 litre: 10¢ Over 1 litre: 25¢	Fees range from 1.67 to 12 cents as specified in the administrative bylaws.	None	212 permitted province-wide depots. Beer containers are collected through licencees, liquor stores and beer stores.	Retained by distributor/bottler	2009 return rates: Aluminum (soft drink) – 86.5% Aluminum (beer) – 90.5% Bi-Metal – 74.1% poly Coat – 56.4% Glass (non-refillable beer) – 94.6% Glass (refillable beer) – 97.1% Glass – 90.5% plastic – 74.4% Overall - 82%
	Notes:	For references and sources, see the Alberta legislation page								
British Columbia	Industry Product Stewardship: Beverage Container Product Category	Implemented 1970, current version implemented in 2004	All ready-to-drink beverages except milk & milk substitutes	All containers for accepted beverages	Non-Alcohol: Up to & Including 1 Litre: 5¢ Over 1 L: 20 ¢ Alcohol: Up to & Including 1 Litre: 10¢ Over 1 L: 20 ¢	Not regulated by government. Varies by container type and retail store or depot agreement.	Not regulated by govt. Determined by producers and their agencies	Return to retail or depots	Retained by producers, or the producer agency, to cover program management including collection, recycling, and consumer awareness.	2010 redemption rates: Encorp (Alcoholic and non-alcoholic): 80% Brewers Distributors Ltd (Refillable beer bottles and domestic beer cans): 94%
	Notes:	For references and sources, see the British Columbia legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Manitoba	Manitoba Product Stewardship Plan (MPSP)		Beer only (all other beverage containers are collected through the blue box)	Beer containers	Beer: 10¢	None	None	Return-to-retail for beer only	Retained by beer distributor/bottler	Refillable beer: 95.5% Domestic beer cans: 74.4% PET: 37% Glass: 34% Aluminum cans: 31% Gable top/Aseptic: 26% Steel: 26% HDPE: 23% OVERALL RESIDENTIAL: 31% (via blue box)
	Notes:	The program described on this page has been superseded by a new program, implemented in 2010: the Packaging and Printed Paper Stewardship Regulation. Until this page can be updated with current information, please see Who Pays What 2010 [pdf], a report describing all the beverage container recycling laws in Canada.								
New Brunswick	Beverage Containers Act	Implemented June 1, 1992	All beverages except milk	All beverage containers under 5L	10¢ (5¢ refunded for non-refillable containers) Alcoholic beverages only: <500ml: 10¢ >500ml: 20¢	Refillable beer containers 2.89¢ All other empty beverage 4.059¢	Half-back system: half of the deposit is returned when containers are redeemed	Return to licensed redemption centers	Returned to the Env't. Trust Fund along with the non-refunded half of the deposit to run env't. programs	Container collection rates[4] Aluminum Cans:79% Non-Refillable Glass:77% PET Bottles:81% Other Plastics:78% Other:47% TOTAL Non-Refillables:75% Refillable Beer:102% TOTAL CONTAINERS :81%
	Notes:	For references and sources, see the New Brunswick legislation page.								
Newfoundland	Greenback Trash to Cash Program		All beverages except milk	All beverage containers except fountain cups, or those with a greater than 5L capacity	Non alcoholic: 8¢ Alcoholic: 20¢		Like a half-back system: 3¢ is kept on the non-alcoholic bottles, a dime on the alcoholic.	37 province-wide depots and 50 satellite depots	Retained by government organization (Multi-Materials Stewardship Board) and used to offset costs. Surplus is placed in provincial trust fund.	Refillable beer: 95% Domestic beer cans: 54.6% OVERALL: 68%
	Notes:	For references and sources, see the Newfoundland legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Nova Scotia	Beverage Container Recycling Program		All beverages except milk	All containers for accepted beverages	Non-liquor: 10 ¢; Liquor: Refillable <1L: 10 ¢ Refillable >1L: 20 ¢ Non-refillable <500mL: 10 ¢ Non-refillable >500mL: 20 ¢	2.75¢ /unit	Half-back system: half of the deposit is returned when containers are redeemed	83 province-wide depots	Retained by government organization (RRFB) and used to offset costs. Surplus is used for municipal curbside and depot programs.	Container recovery rates (2008) Aluminum Cans:84% Non-Refillable Glass:84% PET Bottles:82% Other Plastics:27% Bi-Metal:102% Gable/Tetra Pak:63% TOTAL Non-Refillables:78% Refillable Beer:101% TOTAL CONTAINERS:83%
	Notes:	For references and sources, see the Nova Scotia legislation page.								
Northwest Territories	Beverage Container Program		All ready to drink beverages except milk	Bottle, can, plastic cup or paperboard carton or a package made of metal, plastic, paper, glass or other material, or a combination of them	See detailed table.			Return to one of 18 government depots; Now also 26 community depots	Retained by NWT	Program new. Since beginning in November 2005, by March 15 2006 over 6 million containers had been returned. Original estimates were that 25 million containers were disposed of every year. Some basic number crunching shows an approximate 72% recovery rate. (6x3 / 25)
	Notes:	For references and sources, see the Northwest Territory legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Ontario	Bag It Back, or Ontario Deposit Return Program	February 5, 2007	All alcoholic beverages	All alcoholic beverage containers	Glass bottles, plastic bottles (PET), Tetra Pak containers, bag-in-box: Up to 630mL: 10¢ Over 630 mL: 20¢ Aluminum and steel containers up to 1L: 10¢ Over 1L:¢	None	Companies that introduce packaging and printed paper into Ontario's consumer marketplace pay 50% of the funding of Ontario's municipal Blue Box programs.	Return to Beer Store only, LCBO does not take empties.	Retained by beer distributor/bottler	Redemption rates May 2010 - Apr 2011: Beer 99.8% for refillable bottles; 97% for nonrefillable glass bottles; and 80% for aluminum cans. 94% overall. Other Alcohols Glass: 81%; PET: 48%; Aseptic/Bag-in-box: 23%; Aluminum: 80%; and Overall: 77.5%
	Notes:	As of February 15, 2010, The Beverage Container Regulations under the Waste Reduction and Recovery Act was amended to include all containers for milk and milk supplements excluding those with infant formula or milk products in containers less than 30ml. This page does not reflect those changes.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Prince Edward Island	Beverage Containers Act		All ready-to-drink beverages, excluding dairy and dairy substitutes	All sealed containers holding a qualifying beverage	Liquor Up to 500mL: 10¢ (fully refundable for refillable containers, 5¢ refundable for recyclable containers) Over 500mL: 20¢ (fully refundable for refillable containers, 10¢ refundable for recyclable containers) Other beverages: 10¢ (fully refundable for refillable containers, 5¢ refundable for recyclable containers)	3.6¢, paid by distributor or its agent to the beverage container depot	Licensed beverage container depots	Kept by state		2008 container collection rates Aluminum Cans :73% Non-Refillable Glass :82% PET Bottles :84% Other Plastics : Bi-Metal : Gable/Tetra Pak :44% Other :44% TOTAL Non-Refillables :74% Refillable Beer :101% TOTAL CONTAINERS :81%
	Notes:	For references and sources, see the Prince Edward Island legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Québec		Implemented 1984	All non-refillable beer and carbonated soft drinks	All containers for accepted beverages	Soft drinks containers: 5¢ Beer aluminum cans <450ml: 5¢ Beer aluminum cans >450ml: 20¢ Beer bottles <450ml: 10¢ Beer bottles >450ml: 20¢	2¢ "Return Incentives" paid to retailers from unredeemed deposits	.15¢ fee, paid by distributors to Boissons Gazeuses Evt (BGE) to cover admin costs.	Return-to-retail	Retained by Recyc-Québec and distributors/bottlers	2007 Redemption Rates Non-refillables Soft drinks containers Aluminum cans 67 % Plastic bottles 68 % Glass bottles 36 % Overall 67 % Non refillables Beer containers Aluminum cans <450ml 67 % Aluminum cans >450ml 80 % Glass bottles <450ml 82 % Glass bottles >450ml 74 % Overall 74 %
	Notes:	For references and sources, see the Quebec legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Saskatchewan	Beverage Container Collection and Recycling Program	August 1, 1973	All beverages except milk (milk is under a voluntary recovery program through depots)	Refillable bottles, cans, and other paper or plastic beverage containers. One-way containers are exempt	Aseptic: 5 ¢ Polycoat: 5¢ Metal cans<1 litre: 10 ¢ metal cans>1 litre: 20 ¢ plastic bottles <1 litre: 10 ¢ , plastic bottles>1 litre: 20 ¢ non-refillable glass <300ml:\$1 non-refillable glass: 300ml-1 litre: 20 ¢ non-refillable glass>1 litre: 40 ¢	Aseptic & Polycoat: 3 ¢ Aluminum cans: 5¢ Plastic containers: 6¢ Glass containers: 7¢ Collectors of milk jugs and cartons are provided with a "guaranteed salvage price" of \$400/tonne of baled plastic milk jugs and \$150/tonne of baled milk cartons	Environmental Handling Charge or "EHC" Aseptic: \$.03 Polycoat: \$.03 Metal cans: \$.05 Plastic bottles: \$.06 Non-refillable glass: \$.07	Not-for-profit SARCAN redemption depots	Retained by province and used to pay for the program through SARCAN annual operation contract fee. Surplus is placed in provincial general revenues and helps fund extended recycling programs	2008 collection rates (nonrefillables) Overall: 87% Aluminum: 91% Glass: 89% PET: 82% Other Plastic: 53% Bi-metal: 91% Gabletop/TetraPak: 55% Refillable Beer: 94%
	Notes:	For references and sources, see the Saskatchewan legislation page.								

	Law Name	Dates	Beverages Covered	Containers Covered	Amount of Deposit	Handling Fee	Other Fees	Reclamation System	Unredeemed Deposits	Program Success
Yukon Territory			All beverages except milk and milk substitutes	All beverage containers for accepted beverages	10-35¢, partially refundable (non-refundable portion goes to Recycling Fund)	Paid to depots from Recycling Fund	Processing facilities receive processing fees, paid from Recycling Fund	Return-to-depot	Retained by the Government (Territory)	Container collection rates Aluminum Cans:81% Non-Refillable Glass:87% PET Bottles:96% Other Plastics:64% Bi-Metal:53% Gable/Tetra Pak:50% TOTAL Non-Refillables:76% Refillable Beer:94% TOTAL CONTAINERS:78%
	Notes: For references and sources, see the Yukon Territory legislation page.									
Nunavut	Nunavut is yet to develop any sort of program.									

Information provided by: bottlebill.org

Appendix - Chapter 3
Current Plastics Recycling Systems in Wisconsin

Case Studies and Interviews with MRFs and Markets:

3–A Outagamie County

(Representing the Tri-County “BOW” Group of Brown, Outagamie and Winnebago Counties)

Case study topics:

- ◆ Municipal/County plastics recycling systems for PET and HDPE bottles.
- ◆ Regional single-stream recycling program for three Counties: Brown, Outagamie, and Winnebago (BOW).
- ◆ Capabilities of a publicly owned and operated single-stream MRF.
- ◆ Public education messages about the types of plastics that are acceptable / recyclable.
- ◆ Research needs for BOW Counties to consider before adding more types of plastics.
- ◆ Discussion of supply development options and other policies.

Information sources:

- ◆ Interview with Phil Stecker and Jill Haygood on August 6, 2012
- ◆ DNR RU and MRF reports.
- ◆ *Tri-County Recycle Guide* (April 14, 2012), Contributing Writers: Chris Miller, Joe Van Rossum, Jennifer Semrau, Mark Walter:
http://www.co.winnebago.wi.us/sites/default/files/uploaded-files/tri-county_recycling_guide_single_page.pdf
- ◆ County web pages:
 - ▶ County recycling “Do’s and Don’ts” information page:
<http://www.outagamie.org/index.aspx?page=916>
 - ▶ County MRF description web page (<http://www.outagamie.org/index.aspx?page=766>)
 - ▶ County plastics bags recycling page: <http://www.outagamie.org/index.aspx?page=1055>
 - ▶ Video of the MRF:
http://www.elocallink.tv/vp6/spon-fesa_a.php?sponid=AzdWYQZlAmsOOw==&fvm=1

Collection and Processing

The Tri-County Recycling Facility is operated by the Outagamie County Department of Solid Waste and is the result of the partnership between Brown, Outagamie, and Winnebago Counties, commonly referred to as BOW. In 2007, BOW signed an agreement to develop a single-stream recycling facility for operation over the next 15 years. The state-of-the-art Tri-County Recycling Facility was completed in 2009 at a capital cost of about \$10 million and is one of the largest publicly owned, publicly operated, single stream recycling facilities in the United States. With over 55,000 square feet under roof, the facility currently serves over 65 communities and more than 200,000 households, which accounts for nearly 10 percent of the state's population. In 2011, the recycling facility processed and sold over 52,000 tons of recyclable material. The facility is capable of processing up to 80,000 tons per year, so expanding the service area or commodities accepted is always under consideration.

The County’s MRF web page states:

“The Tri-County Recycling Facility is where the recyclables are:

- ◆ Separated from one another by hand and by high-tech sorting equipment.
- ◆ Compressed into storage bales for easy shipping.
- ◆ Marketed and sold to companies to be re-manufactured into a wide array of new products.

“The Tri-County Recycling Facility is a centerpiece of Wisconsin's recycling industry, creating jobs, protecting the environment, conserving resources and encouraging all to:

‘RECYCLE MORE ... LANDFILL LESS’

About 80 percent of the recyclable material coming into the MRF is residential, curbside collected material and 20 per cent is commercial or institutional material. The educational material approved by the MRF and distributed by the RUs states that “#1 and #2 plastic bottles with a narrow neck or screw-like top are accepted for recycling” (see more details under section 3-A.2, “Public Education” below). There is some movement in the customer cities toward collection of recyclables in carts; approximately three quarters of the curbside recyclables are collected from bin set-outs.

The facility pre-sorts large rigid plastics (5 gallon tubs, kitty litter pails, etc.) and bales the material. There are approximately 20 tons per month of these plastics, even though they are not specified as “accepted” in the program materials. They have found very limited, low value markets for this material, and export it overseas.

Recyclables then move through four screens for size sorting, with plastics moving to the container line. Steel is removed by magnets, and HDPE natural and clear are positively hand-sorted. An automated sorting machine (made by National Recovery Technologies - NRT - under the model name *MultiSort IR™*) removes PET bottles followed by a manual hand-sort for quality control to remove clam shells and other non-bottle PET from this PET stream. Additional quality sorts are made for other recyclables. Residuals from the MRF average less than five percent of the incoming stream.

The MRF currently markets approximately 500 tons per month of PET and HDPE plastics, of which 275 to 300 tons per month are PET. DNR reports from Outagamie County for 2010 indicate that 3,600 tons of total plastic were recycled for that year. All plastics are sold on a spot market basis without long-term contracts, usually to Wisconsin companies. Historically, these have been strong markets.

When asked about potential increases to the types of plastics that must be recycled if the plastic ban waivers are removed, the facility operators were concerned with several issues:

- ◆ The facility already receives more large rigid plastics than they can efficiently process, or can find cost-effective markets for, even without “officially” accepting these materials. This problem would be exacerbated if large rigid plastics were banned from landfill disposal.
- ◆ There is already a significant problem with plastic bags (which are not advertised as being accepted in curbside programs) sorting as a “flat” or paper product. The plastic bags tend to mask other contaminants and/or “float” through the facility and contaminate other processes. For example, the plastic bags interfere with production when they have to be hand-sorted from the paper sorting line or during the optical, automated sorting of PET bottles. The added cost of equipment maintenance is very significant on a daily basis to remove film plastic from screens,

conveyors and other equipment where it becomes entangled. Redesign of the MRF to accept plastic bags would be expensive; probably well beyond the value of any plastic film marketed.

- ◆ The County’s opinion is that other education programs to accept “plastic bags in bags” have not proved effective. Also, the County’s own efforts to encourage residents to use only the designated retail store take-back locations does not totally prevent the bags from getting into the single-stream carts and container drop-off bins.
- ◆ Before deciding to accept additional types of plastics, County staff would prefer to talk to the markets directly and discuss the details about price, quantities and material specifications. The County’s main concern is that any additional requirements to recycle more types of plastics, absent strong market interest, would necessitate significant additional costs that would not be justified by the limited additional revenue.

Public Education

The Outagamie web page (<http://www.outagamie.org/index.aspx?page=1007>) on recycling states:

“Wisconsin residents and businesses are required to recycle paper, # 1 and # 2 plastic jugs and bottles, aluminum and bi-metal cans and food grade glass. The state recycling law bans these items from the landfill along with appliances, electronics, lead acid batteries, tires, yard materials and waste oil and filters. These disposal bans went into effect in several stages, beginning in the 1990s.

“Curbside recycling is just the beginning of a successful program to reduce the amount of trash we send to our landfills. By recycling beyond the bin, you'll join Outagamie County in its efforts to "Recycle More...Landfill Less"

Outagamie County Plastics Recycling Instructions: “Do’s and Don’ts”
 (Excerpt from Outagamie County’s recycling information web page:
<http://www.outagamie.org/index.aspx?page=916>)

PLASTICS



DO RECYCLE	DO NOT RECYCLE
Plastic bottles and jugs (HDPE # 2)	# 2 Tubs
Plastic bottles and jars (PET # 1)	# 3 - # 7 bottles and containers
	Plastic Bags
	Styrofoam
	Motor oil containers

Tri-County Recycle Guide:

Excerpts re: Lists of Acceptable Plastics

(Publication that serves the counties of Brown, Outagamie and Winnebago:

http://www.co.winnebago.wi.us/sites/default/files/uploaded-files/tri-county_recycling_guide_single_page.pdf)

Tri-County Recycle Guide (page 4):

Do Recycle:

- ◆ Plastic bottles and jugs (#1 PETE) such as water and soda bottles
- ◆ Plastic bottles and jugs (#2 HDPE), such as milk jugs and laundry detergent bottles

Don't Recycle:

- ◆ #1 clam shell containers (berry and produce containers)
- ◆ #2 Tubs (cool whip, margarine, yogurt tubs, etc.)
- ◆ #3 – #7 Bottles and containers
- ◆ Plastic bags
- ◆ Motor oil bottles, break (sic) and Transmission fluid bottles
- ◆ Styrofoam
- ◆ Pails (ice cream and kitty litter)
- ◆ Flower pots and garden plastics
- ◆ Food storage and microwave containers

Guidelines:

- ◆ Rinse bottles and jugs
- ◆ No need to remove labels
- ◆ Remove all caps and lids and discard

Additional ***Tri-County Recycle Guide*** information (page 8):

1. “Which plastic containers can I recycle?”

“Recycling plastic not only reduces waste in landfills, but reduces our need to drill for the oil needed to make new plastic materials. In the Tri-County area we collect ONLY # 1 and # 2 plastic bottles and jugs. You can identify your plastic container by the numbering system usually found on or near the bottom of the container. Currently, we are unable to find consistent and reliable markets for the #3 through #7 plastics, as well as wide mouth #2 plastic tubs, but our staff is always on the lookout for new and stable markets for possible future collection of other plastic types.

“Plastic bottles and jugs we collect also need to have a narrow neck and screw cap. Containers that have a wide mouth like a margarine tub are made differently and have a different melting point, so they cannot be mixed together.

“Our plastic buyers also ask that we do not collect motor oil containers as the oil contaminates the plastic. However, vegetable oil containers are okay to recycle.”

2. “Do I need to rinse my containers and remove labels and caps before recycling?”

“As a courtesy to the people who sort the recycling, we ask that you rinse your containers before tossing them into your bin or cart. Also, there is no need to remove the labels because they are burned off during the recycling process. Finally, removing bottle caps and lids is a good recycling habit. When the caps on, the liquids stay in the bottle which makes it difficult for the specialized machinery to properly sort the plastic. The bottle could then end up in the trash rather than being recycled.”

3. Can I recycle plastic bags?

“Plastic bags are NOT accepted through the Tri-County recycling program. The recycling system is not designed to remove plastic bags and plastic bags actually wrap around the equipment, and cause maintenance issues. There are many recycling options for recycling plastic bags. Please take your plastic bags to a local retail store to be recycled.”

Additional *Tri-County Recycle Guide* information (continued on page 9):

8. “Why can’t margarine tubs and yogurt containers be recycled, even though they are #2 plastics?”

“# 2 plastics are made of high-density polyethylene (HDPE) which can be either ‘blow molded’ to form bottles or ‘injection-molded’ to form tubs. The two applications are chemically different and have different melting points, so even though both items have the same code on the bottom, they cannot be collected in our recycling program. A good rule of thumb: if it is a bottle or a jug, and there is a #1 or #2 stamped on the bottom, it’s recyclable.”

3-B Waukesha County

Case study topics:

- ◆ Municipal/County plastics recycling systems for PET and HDPE bottles
- ◆ Regional two-stream recycling program
- ◆ Planning underway for potential expansion / conversion to a single-stream system, potentially in collaboration with City of Milwaukee
- ◆ Recyclables and residuals composition information
- ◆ Research needs for County consideration of adding more types of plastics
- ◆ Policy options.

Information Sources:

- ◆ Interview with Karen Fiedler, County Recycling Coordinator on July 12, 2012
- ◆ DNR RU and MRF reports
- ◆ Additional county recycling reports:
<http://www.waukeshacounty.gov/defaulttwc.aspx?id=40013&terms=recycling+reports>

- ▶ *2011 Annual Recycling and Solid Waste Program Report:*
http://www.waukeshacounty.gov/uploadedFiles/Media/PDF/Parks_and_Land_Use/Recycling/Reports_and_Charts/2007%20RSW%20Prog%20Report%20FIN%2002_12_08.pdf
- ▶ *RRT + GBB Waukesha County MRF Capacity Study (2007):*
[http://www.waukeshacounty.gov/uploadedFiles/Media/PDF/Parks_and_Land_Use/Recycling/MRF/Waukesha%20Final%20Report%20_Combined\(1\).pdf](http://www.waukeshacounty.gov/uploadedFiles/Media/PDF/Parks_and_Land_Use/Recycling/MRF/Waukesha%20Final%20Report%20_Combined(1).pdf)
- ▶ *AECOM Transportation Study: Executive Summary:*
http://www.waukeshacounty.gov/uploadedFiles/Media/PDF/Parks_and_Land_Use/Recycling/Reports_and_Charts/Recycling%20Transportation%20Study%20ExecSum_Waukesha%20County%20%20Wauwatosa%20Final8-10.pdf

Waukesha County is the designated “Responsible Unit” (RU) for recycling planning, and management for specified local jurisdictions in the County. There are 25 communities in the County which all collect the same line of recyclables, including PET and HDPE bottles.

Three of the communities collect recyclables at the curb and there are also 13 “commingled” (two stream) community drop-off sites which include PET + HDPE bottles. The County initiated collection of plastics in 1991 with the start of the original MRF. The County MRF is a public/private partnership: the building and equipment are County-owned and a private contractor operates the facility. The contract MRF operator charges communities \$6.22 per ton for recyclables (tipping fee). The County receives a 50 percent revenue share of gross revenue (not net after processing fees) because the County owns the building and the processing equipment. The County makes improvements to the facility as needed or recommended by the contract operator.

This is a county-owned facility. A private company operates the plant and markets the materials. The plant began operating in 1991 and was expanded in 1996 from 18,880 to 29,312 square feet, increasing the processing capacity from 80 to 140 tons per day. The Waukesha County MRF has two sort lines: one for paper and one for containers.

The private company has about 20 people working on the plant floor and 2 in the office. Employees on the sorting lines wear safety glasses, earplugs, special gloves and long sleeves. In 2011, the plant processed 21,431 tons of recyclables from 87,969 households in 25 participating communities. Private haulers collect the recyclables and daily tonnage varies with an average of about 85 to 90 tons per day.

2011 Processing Information

Material	Where Shipped To	Avg. Bale lbs.	Avg. Bales/Day (% Total Material)
Paper*	Wisconsin - Michigan -Illinois - Tennessee	1200-1500	75 (63%)
PET plastic	Georgia	1100	6 (5%)
HDPE plastic	Michigan	1200	4 (3%)
Steel/Tin	Milwaukee	1240	3 (3%)
Aluminum	St. Louis, MO	740	1 (2%)
Glass	Wisconsin - Illinois	N/A	N/A (24%)
TOTAL			89

*Includes newspaper, phone books, magazines, corrugated cardboard, household mail/paper, boxboard (cereal boxes, beverage carriers).

Source: Waukesha County Recycling Reports

http://www.waukeshacounty.gov/uploadedFiles/Media/PDF/Parks_and_Land_Use/Recycling/Reports_and_Charts/2007%20MRF%20Statistics.pdf

DNR Data:

Waukesha County MRF
Plastic Tons Shipped 2007-11

Year	PET	HDPE NAT	HDPE COLOR	TOTAL
2007	930.95	354.54	303.07	1588.56
2008	904.53	349.85	307.41	1561.79
2009	975.43	370	328.54	1673.97
2010	1027.18	379.64	323.03	1729.85
2011	1040.72	368.73	309.94	1719.39

Source: DNR

The County's MRF sorting system is based on dual-stream recycling: containers are sorted via magnet and air classifier; aluminum and plastics are then hand sorted. There is no eddy current separator. The sorters are on one side of the elevated aluminum/plastics line and they push containers off the belt into commodity specific cages. There are 20 employees at the County MRF, 5 of which directly sort plastics. The positive plastic sorts include:

- ◆ HDPE natural bottles
- ◆ HDPE colored bottle
- ◆ PET bottles (mixed by color)

The #3 through #7 types of plastics (and non-bottle PET + HDPE tubs, jars, cups, lids, etc.) end up as negatively sorted "residual" wastes. A newer Harris (double ram) baler is used to bale plastics. Waukesha currently sells plastic bales to:

- ◆ Tabb Packaging Solutions, Inc. (Plymouth, MI)
- ◆ Placon (Madison, WI)
- ◆ Mohawk (Summerville, GA)

In 2007, the County commissioned a consultant study to conduct a cost analysis of various MRF expansion or transfer options. The study also evaluated the state of the County's existing MRF operations. The RRT/GBB consultant team concluded that, despite its age, the County's MRF continues to provide good recycling service for the participating municipalities. However, there are problems that were recommended to be addressed.

Most important was the capacity of the mixed container processing line of the facility. Since the design and construction of the container line, there have been substantial changes in the number and weight of plastic containers handled by the facilities. This is in part due to the increase in number of "single serve" plastic containers (bottled water) and light-weighting of all types of plastic beverage bottles. The consultant team concluded the mixed container processing line was all but overwhelmed by plastic, forcing the operator to continuously stop and start the line to keep up with the flow of materials. This growth of plastic containers and the specific growth in the use of single serve PET containers still needs to be addressed.

There is a significantly larger percentage increase in the number of containers requiring hand sorting in 2007 compared to when the MRF was first opened in 1991 as the average number of containers per pound has increased during this same period. The RRT Project Team observed numerous and regular

stoppages of the container processing line at the Waukesha MRF due to the sorters being overwhelmed with the amount of plastic on the sort line and the need to stop the system to catch up. The RRT/GBB consultant team concluded that the increase in the number and types of plastic containers will necessitate that any new or retrofitted County recycling facility should include the use of automated plastic identification and sorting equipment. These systems, based upon near-infrared optical sorting technology are considered state of the art in MRF technology today.

3-C City of Madison

Case study topics:

- ◆ City operated curbside program receiving a full line of plastics including the recent, 2012 addition of non-bottle containers and plastic bags.
- ◆ Recent switch of processing contractors.
- ◆ New private MRF in the City's (Eastern) industrial park.
- ◆ Potential for this industrial park to attract other recycling related businesses (e.g., a plastics processor).
- ◆ Ability / capacity to recycle more types and volumes of plastics.
- ◆ Recycling in City parks.
- ◆ Policy options.

Information sources:

- ◆ George Dreckman's participation in project kick-off meeting on June 5, 2012.
 - ◆ Interview with Matthew Mikolajewski, Madison Economic Department on August 13, 2012.
 - ◆ Interview with Charlie Romines, Madison Parks Department, Operations Manager, August 21, 2012.
 - ◆ DNR's MRF reports.
 - ◆ City's web page: <http://www.cityofmadison.com/>.
-

3-C.1 Public Education

The web page (<http://www.cityofmadison.com/streets/recycling/guidelines.cfm>) states:

“Recycling Expands in 2012

The City of Madison is adding new material to the curbside recycling program. You can now put the following items in your green recycling carts:

- 1) Plastic Bags (Grocery and retail bags, produce bags, newspaper bags. No dark green or black bags.)
- 2) Plastic Dairy Tubs and Deli Containers and their lids
- 3) Other Plastic Containers numbered 1-7
- 4) Number 1 plastic clamshells and berry containers
- 5)” [listing of other new recyclables]

“Plastic Recycling

“The following plastic items can be placed in your green recycling cart. Please clean or rinse before recycling:

- ◆ All plastic bottles (except Motor Oil bottles. Motor oil bottles should be capped and put in the trash)
- ◆ All plastic jugs

- ◆ All plastic laundry product bottles
- ◆ #1 Peanut Butter and Condiment Jars
- ◆ Plastic Frozen Juice Containers
- ◆ All plastic dairy tubs (ice cream, sour cream, cottage cheese, yogurt, etc.) and their lids. Remove lids and place in the cart separately
- ◆ All #1 plastic clamshell containers including berry containers
- ◆ All other plastic containers #1-#7

Do not recycle the following plastic regardless of the number on the bottom:

- ◆ Microwave Dinner Plates
- ◆ Plastic Wrap or Cellophane
- ◆ Styrofoam™

3-C.2 2009 Recycling Pilot Program in City Parks

Permits/Licenses:

Elements of the City of Madison Parks Use Permit that reference but don't directly require recycling are:

- ◆ Each organization is responsible for cleanup of the event area. In accordance with Park Commission policies, a cleanup deposit of \$3,000 may be required.
- ◆ Organizations must include plans for collection and disposal of materials during and after their event, including the number and location of garbage/recycling containers and dumpsters and the number/schedule of volunteers/staff assigned to collection and clean up.
- ◆ If City containers are not used; the organization must provide the name of the collection agency providing equipment and service for the event.

Additionally, the City of Madison Parks Department conducted a pilot recycling program in 2009, which is continuing. There are 30 recycling carts on east and west side parks, with concentrations of containers in high use areas. In the roll-out announcement, it was noted that challenges of park recycling programs included:

- ◆ Bottles
- ◆ Adequate staff
- ◆ Correct recycling carts
- ◆ Adequate collection vehicles
- ◆ High "contamination" rates

The Parks Department collaborated with the City Streets Division to use the same recycling carts in the parks that citizens use at their homes. Park staff place the recycling containers in mid-late

May, and remove the containers around Labor Day. Seasonal staff is used to maintain the containers. A different truck than the truck used to collect litter (garbage) containers is used so as not to contaminate the recyclables. Each recycling container is bright blue, and has a label with a list of items that cannot go into the container. All recycling containers tend to be full at each collection. Recyclables are taken to the Pelletieri MRF. Over 2,000 pounds of material was recycled in 2009. Contamination rates were high at Street Mall and boat launch locations, and were lower at a pool, Recreation center and high use athletic fields. Events in Parks may or may not provide recycling. For events that rent specific facilities, recycling may or may not be provided, depending on the renter.

3-C.3 Interview with Matt Mikolajewski

(City of Madison, Planner)

Interview with Matt Mikolajewski & Cynthia Moore
8/13/2012

Southeast Madison has a dozen business parks

The Pelletieri MRF is in one of these. The City of Madison helped them fund the Thermoform and Bottle auto-sort line.

300 acres are platted and zoned for manufacturing

The City works one-on-one with businesses...they come to Madison or Madison becomes aware of them...the City is not pro-active in going out and soliciting businesses.

There are two reasons for this strategy:

1. City only has bandwidth to work with companies who come to them
2. The City has been more successful with companies that want to be in Madison...smokestack chasing has not been effective for the City

The approach they believe will work best is to identify Wisconsin businesses that need this plastic product, identify the processors, marry those two companies up.

They would shy away from creating a branded Eco-Business Park.

Requires lots of money to sink into the branding that would better be spent on 1:1 meetings and into identifying who the companies are and what they really need.

Matt's reading: statewide there is vacant, zoned, industrial property available, it will be relatively cheap...space is NOT a limiting factor.

Manufacturing land is widely available for about \$3.00/sq. ft.

Small business development: City has funded two organizations:

1. Wisconsin Women Business Development Initiative
2. Madison Development Corporation

They also work with the Small Business Development Center at the University of Madison

More established businesses know to make one of two contacts; Matt at the City or Mary Gage, the State WEDC regional economic development contact for the Dane County area.

At the state level, the WEDC is divided into Regions...each Region has a Manager who is the gate-keeper for all of the state programs (tax credits, loans, etc). They are experts in this, and a great resource.

At the City level, Tax Increment Financing (TIF) is available (especially around the Pellitteri site). Companies speak with the local economic development professional and also talk with the state economic development agencies.

Wisconsin Manufacturing Extension Partnership (WMEP)

Madison is not as involved with them, because Madison doesn't have a huge manufacturing base.

Barriers and Challenges for new entrepreneurs....

1. New folks need very solid business plans...very hard to get financing without it. There are organizations out there that will help (SCORE, etc.).
2. Experience is good. It may be better to reach out to processors out of state that would locate in Wisconsin to achieve competitive growth advantages or talk to MRFs/processors in state that want to grow or expand.

Thoughts about Eco-Parks

1. Better to let this grow organically, call by call, meeting by meeting, business by business.
2. WEDC would probably be best suited to carry this concept
3. Trade Organizations might know who would be open to expansion in Wisconsin...having the discussion builds the buzz. They have relationships established and could capitalize on those.

Cynthia asked his thoughts about a half day forum that would bring together people from economic development organizations. Matt's response was to have a half day session that brings in MRFs, processors, and manufacturers. Present a couple of success stories...Have an outline of services available and set them up with introductions to each other, with time for them to get acquainted.

3-D Pellitteri Disposal (Madison)

Case study topics:

- ◆ Private MRF processing City of Madison's and other suburbs' recyclables including a full line of plastics.
- ◆ Private hauler collecting other suburbs' plastics
- ◆ New MRF with automated sorting equipment, including plastics sorting
- ◆ Recent five-year contract with Madison.
- ◆ Located in the City's Eastern industrial park.
- ◆ Ability / capacity to recycle more types and volumes of plastics.

- ◆ Discussion of supply development options and other policy issues.

Information sources:

- ◆ Interview and site visit on Wednesday, June 6, 2012 with David Pellitteri (Cynthia Moore, DNR; and Dan Krivit, Foth)
- ◆ DNR's MRF reports
- ◆ City's web page:
- ◆ Pellitteri's web page: <http://www.pellitteri.com/> including the video describing their recycling systems
- ◆ Wright, Shawn (August 9, 2011); "*Madison Wisconsin Likely to End Contract with WM*"; *Waste & Recycling News* article: <http://www.wasterecyclingnews.com/article/20110809/NEWS03/308099992>
- ◆ Mosiman, Dean (August 8, 2011); "*Million Dollar-Plus Madison Recycling Contract Up for Grabs*"; Article in the *Wisconsin State Journal*: http://host.madison.com/wsj/news/local/govt-and-politics/million-dollar-plus-madison-recycling-contract-up-for-grabs/article_8bfc9160-bb3a-540d-a6f4-91208301cd60.html
- ◆ Glaze, Jeff (January 2, 2012); "*City to Accept More Plastic and Metal Items in Recycling Bins*"; Article in the *Wisconsin State Journal*: http://host.madison.com/wsj/news/local/environment/city-to-accept-more-plastic-and-metal-items-in-recycling/article_5675d0e0-34e8-11e1-b24e-001871e3ce6c.html
- ◆ NEXGEN (August 9, 2012); "*Single-Stream MRF at Pellitteri Waste Systems in Madison, WI*"; A promotional video on NEXGEN's equipment and processing lines, including those installed at the Pellitteri single-stream MRF as a case study via YouTube at: <http://www.youtube.com/watch?v=D1AflNdSor8>
- ◆ National Recovery Technologies, Inc. (NRT) web site (www.NRTSorters.com), including equipment brochures for automated plastics sorting machines including their SpydIR™ machine that sorts RIC plastic types #1 through #7: <http://www.nrtsorters.com/Brochures/SpydIR.pdf>

Pellitteri Waste Systems provides trash and recycling collection service to commercial, industrial, and residential customers in the greater Madison Area and throughout Dane County.

Municipal curbside recycling programs with Pellitteri collection service:

- | | |
|----------------------------|------------------------------|
| ◆ City of Fitchburg | ◆ Village of Brooklyn |
| ◆ City of Middleton | ◆ Village of Oregon |
| ◆ Town of Pleasant Springs | ◆ Village of Shorewood Hills |
| ◆ Town of Verona | ◆ Village of Waunakee |

Pellitteri opened a new 30,000 square foot materials recovery facility / solid waste transfer station in 2010 at 4002 Kipp Street in the "Waubesa Business Campus" industrial park on the southeast side of Madison. In August 2011, the City of Madison awarded Pellitteri the processing contract for curbside recyclables collected by City crews. This residential recyclables processing contract had previously been with Waste Management (WM) via a transfer operation

off the South Beltline where WM would transfer the materials to their Germantown MRF near Milwaukee. WM had the City's recyclables processing service contract for 20 years.

The new City contract with Pellitteri is for a five-year term (2012 through 2016). The new contract allowed Pellitteri to invest in the expansion of their single-stream MRF. The expansion of MRF was opened in April 2012 and added another 55,000 square feet immediately adjacent to the original transfer station, including an education center for school and community tours. The addition is estimated to generate up to \$50,000 per year in property taxes and create about 18 new local jobs. The City also expects to see additional revenues from the new materials being accepted by Pellitteri including all types of plastics (RIC #1 through #7) and plastic bags. The City receives 80 percent of the revenue when Pellitteri sells recyclables to various markets. By increasing the number of recyclable items collected and marketed, the City will make more money back from new material revenues which City staff estimated to be around \$60,000 annually.

The new Pellitteri MRF uses an extensive combination of automated equipment and manual sorting systems to receive and process the single-stream materials. At the very beginning of the process, plastic bags / other film and large bulky plastics (e.g., five – gallon buckets; toys, furniture; cat litter jugs/trays; etc.) are positively sorted off the conveyor belt. The paper (or “fiber”) materials are then largely sorted by disc, other screens, air classifiers and some manual sorting. Magnets and eddy current separators automatically sort the steel and aluminum cans into separate streams. The plastics remain at the end of the “container sorting line”.

The plastic products are also sorted by a combination of automatic machines and manual labor. The PET containers are sorted off the container line (defined as “positive sorting” off the belt) by an automatic infrared PET detection/sorting machine made by NRT under the model name “SpyDIR”. Pellitteri stated the SpyDIR recovery rate is about 92 to 95 percent for PET containers, with very little if any cross-contamination of other materials into the PET product. The remaining “mixed plastics” go off the end of the line (i.e., “negatively sorted”) where one more manual sorter picks for any remaining PET containers. The HDPE – natural bottles (e.g., milk jugs, water jugs, etc.) and the HDPE – colored bottles (e.g., laundry detergent jugs, gallon orange juice jugs, etc.) are manually sorted off of the plastics sort line.

The Pellitteri MRF currently sorts and “markets” the following types of plastics:

- ◆ PET (both bottles and thermoforms mixed into one bale)
- ◆ HDPE – natural bottles
- ◆ HDPE – colored bottles
- ◆ Bulky rigid materials
- ◆ Plastic bags/film
- ◆ Mixed plastics (e.g., RIC #3 through #7)

David Pellitteri made the following comments in the interview and site visit:

- ◆ Pellitteri sells on a spot market basis; they generally do not have contracts for recyclables.
- ◆ Their markets for the PET and HDPE products are very strong, “sold out”.

- ◆ He has not yet found a good domestic market for the mixed plastic bales (RIC types #3 through #7). This is the lowest grade of plastics and so far has been an economic loser, although the volume is low and the MRF is so new they've only shipped a couple of loads of this commodity. He is concerned what may happen to this grade if China stops accepting these mixed plastic bales. Pellitteri will use four to five sorters to handle the PET and HDPE products, but need to add another two to four more to handle sorting of the mixed plastics.
- ◆ The plastic bags and other film are a new commodity for Pellitteri and, although the City of Madison is collecting these items curbside, Pellitteri is not promoting it to other customers. The bags/film items are a nuisance to sort (e.g., labor to sort and added equipment maintenance) and the baled product is not as clean as it should be.
- ◆ The government sector and recycling industry will need to look for additional sources of recyclables (e.g., multi-family, other commercial establishments, "dirty MRF" designs, mining of recyclables from landfills, etc.).
- ◆ Drop-off stations should be considered for some of the harder to recycle items (e.g., film/bags).

3-E Waste Management (Germantown)

Case study topics:

- ◆ Private MRF processing recyclables including a full line of plastics.
- ◆ Private hauler collecting recyclables from residential communities and commercial establishments, including plastics.
- ◆ Germantown MRF with automated sorting equipment, including optical (infrared) plastics sorting.
- ◆ Ability / capacity to recycle more types and volumes of plastics.
- ◆ Discussion of supply development options and other policy issues.

Information sources:

- ◆ Phone interview on Wednesday, June 6, 2012 with Mike Lunow and Lynn Morgan (with Cynthia Moore, DNR; and Dan Krivit, Foth)
- ◆ DNR's MRF reports
- ◆ WM's web page:
 - ▶ Video describing their recycling systems and the Germantown, WI MRF: http://www.youtube.com/watch?v=pa_ebNcz8c
 - ▶ WM's plastics web page: <http://www.wm.com/customer-service/residential-recycling-faq.jsp#plastic1>
 - ▶ WM's web page on the plastic RIC "codes": http://www.thinkgreen.com/recycle-what-detail?sec=plastics&prod=resin-identification-code&tab=where_can_i_recycle

- ▶ *Plastics: What's Widely Accepted?*
http://www.thinkgreen.com/recycle-what-detail?sec=plastics&prod=easy-recycle&tab=where_can_i_recycle
- ▶ *Plastics: What's Less Commonly Accepted?*
http://www.thinkgreen.com/recycle-what-detail?sec=plastics&prod=less-easy-recycle&tab=where_can_i_recycle
- ▶ *Learn More About Recycling Plastics*
http://www.thinkgreen.com/recycle-what-detail?sec=plastics&prod=learn-more&tab=where_can_i_recycle
- ▶ WM's news release about investment in the Agilyx plastics to oil (PTO) technology "WM Announces Investment" (Mar 31, 2011)
http://www.wm.com/about/press-room/pr2011/20110331_Waste_Management_And_Agilyx_Annouce_Strategic_Investment.pdf

WM Collection and Processing (MRF at Germantown, WI)

Waste Management (WM) is arguably the largest collector and processor of residential and commercial recyclables in the world. The company states it processes and markets about 5 million tons per year of recyclables. WM has about 150 materials processing facilities throughout the world.

WM's MRF in Germantown, Wisconsin is one of their larger single-stream processing plants at 165,000 square feet with a design capacity of 700 tons per day of recyclables. This Germantown MRF serves as a regional hub for recyclables from WM collection routes and any other merchant materials. Materials are delivered directly from route trucks or via transfer trailers from more distant recyclables transfer stations.

The WM process at the Germantown MRF involves a "pre-pick" of non-recyclable items (including plastic bags). Then the material is fed onto a series of disc screens for sorting of the fiber (paper) products from the rigid containers (cans, glass, plastics). Once the material is sorted down to rigid containers only, the steel cans are pulled off with an overhead belt magnet. The aluminum is then pulled off with an eddy current separator.

The remaining plastic containers are then automatically sorted with a series of infrared optical sorters into PET and HDPE streams. The plastics products (e.g., PET, HDPE – natural, HDPE – colored) are inspected and picked for any contaminants that can be manually removed from the sorting conveyor.

The Germantown, WI MRF, as a general rule, processes more commercial material compared to the WM Minneapolis, MN MRF which processes more residential recyclables.

The City of Milwaukee recently converted their residential recycling system to single-stream, converting their City MRF into a single-stream recyclables transfer station.¹ WM is the contract operator for the City's recyclables transfer operation and hauls the materials to the WM – Germantown MRF. Milwaukee's current list of plastics in its new single stream program now includes "all plastics numbered 1, 2, 4, and 5" and "Bulky #2 plastics (e.g., 5-gallon buckets)".²

WM Public Education

WM has extensive public education literature and instructions. While the details are often customized to the individual community, some of the more generic plastics recycling information is also posted on their web pages. Below are some of the excerpts for WM web pages listed under "Information Sources" above.

"How can you tell what kinds of plastic to put into your recycling bin? There's no simple answer. The equipment at processing facilities varies, so the only sure way is to check with your municipality to see which plastic items it accepts."

"There are, however, general guidelines. Turn the product over and look for the recycling symbol, a triangle with a number from 1 to 7 inside. That number is the "resin identification code," or RIC. Each number represents a different type of plastic, and some numbers are easier to recycle than others."

"Some municipalities accept all types of plastic. Others accept only containers with certain code numbers stamped on them. Still others accept only products with specific resin codes that also are bottles (having a neck that's narrower than the body).

"Note that the same type of product may be packaged in different types of plastic. Shampoo, for example, is commonly packaged in bottles made of Code 2 and Code 3 plastic, depending on the brand. Check the code to determine."

"If you have questions about whether a plastic item is recyclable, call your municipality or local recycling center."

"One important thing to keep in mind as you recycle plastics is that cleanliness is essential. One dirty product, or one with food waste still in it, can contaminate an entire bale containing thousands of pounds of collected plastics."

"Typical Dos:

- ◆ "Make sure it's clean! Does that peanut butter jar still have some remnants sticking to the side? Don't recycle it until it's clean!"

¹ City of Milwaukee web page "Milwaukee's MRF Building"
<http://city.milwaukee.gov/mpw/divisions/operations/environmental/sanitation/recycling/MaterialsRecoveryFacility.htm>

² City of Milwaukee *Recycling Guidelines*:
http://www.milwaukeecycles.com/documents/Recycle-For-Good_Guidelines_English.pdf

- ◆ “Products labeled Code 1 and Code 2 are widely accepted at recycling facilities. These typically include soft drink and soda bottles; plastics from cereal boxes; containers for salad dressing, vegetable oil, and peanut butter; oven-ready meal trays; butter and margarine tubs; and containers for laundry detergent and some household cleaners.

“Typical Don’ts:

- ◆ “Municipalities differ on whether to accept products labeled with Code 4 and Code 5. These typically include squeezable bottles, bread wrappers, frozen food bags, dry cleaning bags, yogurt containers, syrup bottles, ketchup bottles, some straws, and prescription bottles.
- ◆ “Plastic grocery and produce sacks are commonly, but not always, made from plastic types 2 or 4. These bags are often collected in barrels at grocery stores.
- ◆ “Products labeled with Code 3, 6, or 7 are less-often accepted for recycling. These typically include window cleaner and dishwashing detergent bottles, some shampoo bottles, cooking oil bottles, clear food packaging, plastics used in most blister packs, disposable coffee cups, polystyrene, plastic egg cartons, aspirin bottles, and compact disc cases.
- ◆ “Each municipality has its own local criteria for what can and can not be recycled. Check with your closest Waste Management facility for specific services in your area.”

Other plastics recycling instructions by WM via their web pages:

- ◆ “Please remove caps.”
- ◆ “Note: Black microwave trays are Code 1 but may not be mixed with other Code 1s such as clear or green soda, water, or salad dressing bottles. Check with your municipality to find out if black microwave trays are accepted for recycling.”
- ◆ “LDPE is a flexible plastic with many applications. Historically it has not been accepted through most American curbside recycling programs, but more and more communities are starting to accept it. Check with your local community recycling program.”
- ◆ “Code 5 (PP)” “May be accepted by your curbside recycling programs. Call your local recycler.”

“Learning More About Recycling Plastics”:

“Plastics come in a variety of colors and chemical formulations – all with different recycling needs. The code number does not mean the plastic can be recycled. It is simply a way to identify the resin, or plastic, type. Different types of plastic must not be mixed for recycling.³ One reason is that the different resins have different melting points. Even a small amount of the wrong type of plastic can ruin an entire container or bale of recyclable plastic. Example: Most

³ WM’s statement “Different types of plastic must not be mixed for recycling...” should be qualified to say “...when used by the end-use manufacturer.” WM did not mean to imply that residents or business should separate the recyclable plastics by resin type or melting point, etc.

clear bottles are made of a Code 1 plastic, but some are made of Code 3 plastics. A single Code 3 item can ruin an entire bale of Code 1 recycling.”

“Plastic grocery and produce sacks are commonly, but not always, made from plastic types 2 or 4. These bags are often collected in barrels at grocery stores, and usually end up as plastic lumber.”

“If your local recycler doesn't accept a particular type of plastic, it's probably because the market for that resin is small or non-existent.”

WM Investment in the Agilyx Plastics to Oil as an Alternative Technology

In March 2011, WM announced it invested in the Agilyx plastics to oil technology. “Agilyx is the first company to economically convert difficult-to-recycle waste plastic into high quality synthetic crude oil. Agilyx’s fully-permitted, patented waste plastic conversion technology recycles mixed waste plastic into synthetic crude oil in a scalable, versatile, and environmentally-beneficial manner. Its expertise is in its efficient, anaerobic thermal reclamation process and in the commercial application of this process, including building and operating commercial-scale systems, and successfully marketing synthetic crude oil as a feedstock to existing petroleum refineries. The Company deploys its systems with companies engaged in the management of plastic waste streams.

“Tim Cesarek, managing director of Organic Growth at Waste Management, said “Agilyx’s technology complements Waste Management’s advancement of thermal chemical conversion technology platforms and provides us with a viable option for processing contaminated and hard to recycle plastic resins and creating a high value commodity.”

“Agilyx’s facility near Portland, Oregon is the largest commercially operational waste plastic to synthetic crude oil facility in North America. The Company was the first of its kind to successfully permit in the U.S. and has the first refinery off take agreement in the industry.”

“Agilyx uses an oxygen-free chamber and heat to process plastics that are made of mixed resins (from plastics that) may be dirty or greasy. Crude oil created from the used plastics can be used again to make fuels, inks, printing supplies, and even new plastics.”

WM Discussion of Supply Development and Other Policy Options

WM staff is concerned about the stability of state laws. Many of their collection programs and MRFs have been planned and designed based on the assumptions of current state policies and programs. For example, WM is concerned for the future of the State of Wisconsin support for local RUs and their municipal recycling programs. This support is critical for recycling companies, large and small, to have some level of certainty that recycling initiatives are here to stay. Even more important, however, is having stable end-use markets that can reliably purchase the large volumes of recyclables that WM produces.

WM, in numerous forums, has stated a preference for plastic bags/film to be collected in separate retail drop-offs and other commercial establishments and not by curbside collection.

The investments that the WM “*Organic Growth*” division is making into alternative technologies, such as plastics-to-oil, may be able to help provide a viable outlet for the waste plastics that are not able to be recycled.

3-F Milwaukee Brewers’ Miller Park (Milwaukee)

Case Study:

- ◆ Away from home recycling project: Large sports stadium (Major League Baseball team)
- ◆ Challenges of sustaining high quality recycling service (i.e., bins)
- ◆ Quality of recyclable materials collected
- ◆ Economics

Source:

- ◆ DNR staff (unpublished data, personal communications, etc.)
- ◆ Milwaukee Brewers’ web page: <http://milwaukee.brewers.mlb.com>
- ◆ Teddy Werner, Milwaukee Brewer’s staff (via Lynn Morgan, Waste Management)

Over the past few years the Milwaukee Brewers have undertaken several “green initiatives” including planting trees, saving energy and water, donating money to environmental organizations, donating unused food, and collecting recyclables within Miller Park.

The Milwaukee Brewers have dramatically boosted recycling at Miller Park by continuously improving opportunities to recycle in and around the stadium. Since 2010, 35 percent of all waste has been diverted from landfills to recycling. On average, Miller Park recycles approximately 7 to 8 tons of waste from each game.

Urging fans to recycle in tailgate areas has been a particular focus for the Brewers. To make recycling as convenient as possible, the Team has steadily increased the number of recycling containers throughout the stadium's parking lots and outdoor pavilions. During the 2012 season, fans were served by more than 60 recycling containers in those areas, including a recycling container paired next to each solid waste container.

Fans deposit their loose cans, bottles, deli containers and other recyclables in the large, clearly marked containers. Waste Management, the Brewers' recycling and waste service provider, collects the recyclable materials for sorting and processing at the company's Germantown materials recovery facility.

The effort has been a growing success: Recycling in tailgate areas has increased every year since 2010, thanks to the expanded recycling opportunities and the Team's robust fan outreach.

The Brewers plan to continue to refine and improve recycling through ideas gleaned from pilot projects, fan education and feedback, and other sources. During six home games in 2012, for example, the Brewers worked with Keep Greater Milwaukee Beautiful, the DNR, a corporate sponsor and volunteers from two local environmental groups to test a pilot "blue bag" program. The pilot consisted of volunteers offering blue plastic bags and recycling information to tailgaters in three parking lots.

Another pilot project during 2012 placed recycling containers in the areas just outside the gates to capture beverage containers discarded by fans as they enter the stadium. Waste Management adapted the containers to prevent leaks from partially full beer, soda and water containers. The pilot was an immediate success, both in recovering recyclables and reducing litter around the approaches to the stadium.

Other recycling efforts at Miller Park recover used kitchen oil, corks, cardboard, plastic and metal from food preparation areas. In 2011 and 2012, the Brewers held electronics recycling events at Miller Park. The Brewers' initiatives also extend to waste reduction; for example, concession stands no longer automatically dispense cups and straws with drinks, resulting in a reduction of 20% in the use of these plastic items that would otherwise end up in a landfill.

3-G Green Bay Packers, Lambeau Field (Green Bay)

Case Study:

- ◆ Away from home recycling project: Large sports stadium (National Football League team)
- ◆ Challenges of sustaining high quality recycling service (i.e., bins)
- ◆ Quality of recyclable materials collected
- ◆ Economics

Source:

- ◆ DNR staff (unpublished data, personal communications, etc.)
- ◆ Green Bay Packers Website: <http://www.packers.com/lambeau-field/index.html>

One example of a venue that in the past made an effort to comply with recycling requirements is Lambeau Field. The Packers launched their "Packers Green Team" initiative in 2008. This effort leveraged the Wisconsin Public Service's "NatureWise" renewable energy program and recycling programs offered by Waste Management, the team's waste and recycling partner/contractor. More recycling opportunities, in the form of additional recycling containers shaped like beverage bottles, were offered in several areas around the stadium. The parking lot of Lambeau Field already had large, helmet shaped recycling containers. Packers CEO Mark Murphy committed to stepped up efforts to educate fans, stating that "*We need our fans help on recycling....we need our visitors to be cognizant of where to discard their used items.*" The 2007

– 2008 season collected 2 tons of recyclables per game, consisting mostly of plastic bottles. The logo for the program was “*Defending Our Resources*”⁴.

3–H Alliant Energy Center (Madison)

Case Study:

- ◆ Away from home recycling project: Large convention center
- ◆ Challenges of sustaining high quality recycling service (i.e., bins)
- ◆ Quality of recyclable materials collected
- ◆ Economics

Source:

- ◆ Alliant Center staff (unpublished data, personal communications, etc.)
- ◆ Alliant Energy Center’s web page: <http://www.alliantenergycenter.com/>

One example of convention facility recycling in Wisconsin is the Alliant Energy Center in Madison. The Alliant Energy Center is the home of the Dane County Fair, and other events, conventions and festivals year round. The Alliant Energy Center is very concerned about the environmental impact of its visitors and events and prominently uses their Green ethic in promotion of the Center. In April of 2007, the Alliant Energy Center received the Travel Green Certification from the Wisconsin Department of Tourism for its efforts to reduce the environmental impact through operational and other energy-saving improvements. To achieve the Travel Green Certification, tourism-related businesses must meet several goals including demonstration of how they encourage staff and vendors to be environmentally aware and how they reduce their solid waste generation and energy consumption. The Center is a leader in recycling of cardboard and paper in Dane County. There are recycling containers in all permanent buildings, and in outdoor areas for outdoor events. The recyclables containers are handled in a single-stream system. Collection and processing of recyclables is provided by Pellitteri Waste Systems.

3–I Barron County

Barron County is a rural county in northwestern Wisconsin that relies heavily on tourism for economic activity.

Case Study:

- ◆ Mixed messages to same customers about acceptable plastics
- ◆ Two program operations: Barron County and Community Disposal and Sanitation

Sources:

⁴ Green Bay Packers “*Defending our Resources*” former program web page: www.packers.com/community/green_team .

- ◆ Barron County web page: <http://www.mosaictelecom.com/~recycle/>
- ◆ Community Sanitation & Disposal, Inc. web page: <http://communitysanitation.com/>

**Community Disposal and Sanitation, Inc. (XX, WI) vs. Barron County
Plastics Recycling Lists:**

Community Disposal and Sanitation, Inc

Milk and Juice Containers
Pop and Water Bottles
Laundry and Soap Bottles

Barron County Recycling Guide

Milk and Juice Containers
Pop and Water Bottles
Laundry and Soap Bottles
Other “Narrow Necked”
Bottles with the
following symbol
(recy 1, rec 2)

3-J IROW

Case study topics:

- ◆ Reclamation and end-use manufacturing markets in Wisconsin
- ◆ Ability / capacity to recycle more types and volumes of plastics
- ◆ Policy options.

Information sources:

- ◆ Interview with Cory Tomczyk, President & Owner
- ◆ DNR's MRF reports
- ◆ IROW's web page: <http://www.irow.bz/>

IROW offers shredding, recycling and waste services to Marathon, Wood and Portage Counties in Wisconsin. The company focuses on commercial and industrial customers, specializing in paper and plastics recycling, and has residential garbage and recycling routes. Specific plastics they have markets for include Polyethylene industrial waste and films, PET blow-molded and sheet forms, polypropylene rigids and non-woven fabrics, polycarbonate, several forms of polystyrene and extruded Vinyl in flexible and rigid forms. In addition, if a customer has a specific waste type, and IROW is able locate markets for that material, they will. The majority of their markets are domestic, with Wisconsin Film and Bag a significant local market.

In discussing potential improvements to recycling of plastics in Wisconsin, IROW had several points:

- ◆ Although many persons wish to recycle agricultural films, there is no reliable market for this material. Redirecting this material from landfill disposal would best be accomplished by using the material as a fuel product. There is a significant amount of wood waste presently being landfilled that could be diverted for beneficial reuse. The direction of DNR resources into the area of wood waste diversion would have a greater impact than chasing the elusive solution of recycling Ag films.
- ◆ Two thirds of Wisconsin is rural area. There has been a strong focus in prior years on grant funding in the Madison and Milwaukee areas, especially in recycling collections infrastructure. For increased recycling to occur throughout the state, capital investments must be made in processing infrastructure, especially in areas of the state that are not well served by existing large MRFs. If it is important to build a Wisconsin recycling infrastructure and support Wisconsin jobs, local companies should be supported to be competitive with out-of-state and multi-national firms. There is a fundamental lack of understanding of this need by government waste industry persons. Building a strong recycling infrastructure to support industry that uses recyclable commodities requires an understanding of business needs.
- ◆ There are markets for material from Wisconsin MRFs; moving plastics that are now banned from landfills is usually not a problem. If additional plastics will be added to the recycling stream, it would be helpful if regional and state economic development

agencies would provide assistance in marketing these goods locally and internationally. The growing effort to add “all plastics” to the recycling bin is very appealing to all involved, but will not substantially increase materials available for reuse and manufacture unless optical sorting operations are placed within the state to process those types of plastic mixes close to “home.”

- ◆ Enforcement of laws and bans that are currently in place would significantly improve the amount of plastics recycled. Residents, businesses, restaurants, special events and public places (arenas, athletic facilities) were noted as having significant amounts of banned recyclables that are landfilled. Additional laws, such as Extended Producer Responsibility requirements are not seen as needed to increase recycling in Wisconsin and could have unintended negative impacts on the existing infrastructure. Concern was expressed that the MRFs would lose control of the product value under those laws.
- ◆ For recycling to be cost-effective in the long term and to be able to withstand market fluctuations, baling and shipping of plastics is not the best course of action. Processing capacity should be paired with manufacturing or end use capacity. The Eco-Park concept is ideal for out-state needs. An example of a company in Green Bay was given, which had a very fine processing facility. However, because transportation of their product to manufacturing facilities was not cost-competitive with virgin or recycled material created closer to the manufacturing facilities, the Wisconsin processor failed. “Finishing the job” is very important to a sustainable Wisconsin recycling industry.

Increased recycling in the northern part of Wisconsin faces three hurdles:

1. The haulers in that part of the state are smaller, very independent haulers. For increased recycling of plastics to occur someone has to build the processing capacity, locally.
2. Small haulers have difficulty competing with large multi-national firms, and taking risks or lining up financing to develop new infrastructure or new markets is very difficult. The multinational firms do not contribute to local jobs, since they aggregate the recyclable to ship out of state for processing, and use international, not Wisconsin-based markets.
3. Geographic factors hinder increased plastic recycling in outstate and rural areas. People and MRFs are spread out. For additional plastics recycling to happen, there has to be secondary processing available, locally, to achieve transportation cost-effectiveness. In the long run, baling and shipping is just not enough to sustain the collection and MRF infrastructure. DNR grants have previously been focused on the collection infrastructure; processing infrastructure is needed. A processing facility that would grind, wash, and pelletize plastics could employ as few as 10 to as many as 20 depending on the size.

There is a back haul system in place for many small retail chains. However work still needs to be done. In his view there are two challenges to bringing more film to market. #1-Storage space at generation site, most business's don't have space to store loose film and don't generate enough to pay for a baler. #2- Hauling around loose film isn't cost effective. So even if they are willing to

store it recyclers may not want to haul it far. I ROW does haul loose film but only when we are getting paper or other rigid plastics.

3-K N.E.W. Plastics Corp.

Case study topics:

- ◆ Reclamation and end-use manufacturing markets in Wisconsin
- ◆ Ability / capacity to recycle more types and volumes of plastics
- ◆ Policy options.

Information sources:

- ◆ Interview with Mike Rekitzke
- ◆ DNR's MRF reports
- ◆ N.E.W. 's web page: <http://www.renewplastics.com/>

Headquartered in Luxemburg, Wisconsin, N.E.W. has been a leader in recycled plastic since the late 1960's. They manufacture containers, plastic lumber and components made from virgin and recycled material. The company has annual sales of \$35 million and continues to grow. They have 25 million tons per year of recycled plastics capacity. They manufacture plastic lumber in ½ X ½ inch to 12 inch timbers (reinforced with fiberglass).

They started out in curbside collection of recyclables. They collected, washed and ground their own materials. They no longer have a wash line, but have considered putting in a line. They do have a metal detector on their grinders, because of the take-back of plastic lumber that they do.

They recycle material that they produce (i.e., take-back their own products for recycling) and purchase clean recycled resin material. Approximately 90 percent of the material they buy is HDPE flake, and 10 percent is polypropylene. They do not recycle any film plastics.

The amount of recycled material they use is dependent on how readily they can access quality, recycled flake. High quality material is a requirement and the chemical composition of the material is a key. A good share of the HDPE is "too contaminated" with calcium stearate, which is used to quicken cooling and stiffen side walls of containers. If N.E.W. uses HDPE with calcium stearate in their plastic lumber products, there will be a dust, or bloom, on the resulting lumber, which is a flaw and would require them to take back the substandard lumber.

Mr. Rekitzke was asked what is limiting the growth of N.E. W. plastics. He stated that local recycled materials are important. Since N.E.W. recycles rigid plastics, there is a lot of air that is shipped in the bales. He has found that 350 miles is the maximum that he can ship the unprocessed material and remain competitive. The plastic lumber industry is very competitive, and a lower cost recycled material or lower shipping costs would help his bottom line, and help him expand. He noted that an expansion of the Wisconsin recyclables bans to include non-bottle HDPE might increase the local supply of recyclables.

He also noted that he would use more recycled materials if he could find quality distributors of recycled resin. He has tried to branch out and use new or different distributors, but ended up with contaminated, poorly sorted materials that N.E.W. couldn't use. They buy from a couple of companies in Illinois that have been long term, loyal relationships. He noted that the corridor along the lake has been very good from a transportation point of view.

N.E.W. Plastics was green before green was cool. They build to LEED standards, and their products obtain LEED points for the companies that use the plastic lumber. They have investigated a new process line, but obtaining capital was prohibitively expensive. Assistance with low interest loans or knowledge of tax rebate programs would help them expand.

Mr. Rekitzke believes that there is demand for recycled plastic lumber and growth is possible in this industry. However, he is too small to get the help from Exxon and Mobil that other companies do; that's one reason that good partners, and long-term stable relationships with recycled content supplies always have been so very important to their business.

3-L Placon

Case study topics:

- ◆ Reclamation and end-use manufacturing markets in Wisconsin
- ◆ Ability / capacity to recycle more types and volumes of plastics
- ◆ Best role for the state
- ◆ Policy options to increase quality and quantity of supplies

Information sources:

- ◆ In person interview at Placon's offices near Madison with Daniel F. Mohs, CEO on June 6, 2012 (together with Cynthia Moore, DNR; and Patty Moore, Moore Recycling Associates)
- ◆ DNR's MRF reports
- ◆ Placon's web page: www.Placon.com
- ◆ Holbrook, Jessica (June 6, 2012), "*Placon Launches Deli Containers from Post-Consumer PET*"; [Plastics News](#) article about Placon
- ◆ Verespej, Mike (February 2, 2012), "*Perpetual to Build \$30 Million PET Recycling Plant in Indiana*"; [Plastics News](#) article about competing PET recyclers
<http://plasticsnews.com/headlines2.html?id=24398&q=Placon>

Interview Results:

- ◆ Lack of supply of recyclable PET is the biggest challenge to our growth, yet the collection and processing infrastructure exists. PET reclamation is the most developed of the plastic resins. Our PET recycling rate in the U.S. is around 30 percent, compared to Europe where the recycling rate is about 50 percent.
- ◆ Our supply comes primarily from the Midwest, but suppliers ship from as far away as each coast. Cost of transport from more distant sources is high. We could save an

average of around \$0.08 per pound on cost of transportation if we could source more of our material from Wisconsin and nearby states.

- ◆ This type of policy analyses needs to look at demand side too, not just supply.
- ◆ Averaging about 52 percent, our actual bale yield rates are awful. . There needs to be better sorting at MRFs based on “best practices” guidelines. Training and education should be a part of the mix of study recommendations.
- ◆ One of the most significant contaminants in our supply is the film labels used on the PET bottles (e.g., V8, Selby Water). These labels are often made of PET-G; PLA or PVC. Alternative, more standardized and recyclable labels would be helpful (e.g., all PP labels). Need more attention on the upfront “design for recyclability” (DFR) standards (e.g., APR’s DFR guidelines). It would be best if such a label were all PP. But there are some very large manufacturers with a vested interest in labels made of (contaminating) resins such as PET-G.
- ◆ Placon has a submarket for PP and HDPE byproducts from its sink float tanks.
- ◆ As PET bottles continue to be light-weighted, the use of material density / and air classification to sort labels from Recycled PET (R-PET) flake is more difficult. The lighter flake makes separation from the shredded label more difficult.
- ◆ Extended producer responsibility (EPR) boards are like “packaging death panels” making decisions about which products should live or die rather than allowing the competitive marketplace to influence these outcomes

Placon’s primary business is designing, manufacturing and marketing plastic thermoforms and extruded plastic sheet for food, retail and medical products. Placon, headquartered in Madison, has been around for more than four decades and currently employs more than 300 people worldwide with Wisconsin locations in Madison and Fitchburg, and another facility in Elkhart, Indiana. According to *Plastic News* magazines, Placon ranks among the top 20 thermoformers in the U.S. with a 2011 sales of \$114 million.

Placon Corporation recently opened its new closed-loop plastics recycling facility in Fitchburg, Wisconsin which is designed to process 36 million pounds a year of PET. Placon invested \$14 million in this recycling facility. The 70,000-square-foot facility processes post-consumer bottles as well as thermoforms as part of a stand-alone manufacturing location. Placon works with EcoStar, which purchases bales of post-consumer PET bottles and thermoform packaging from curbside recycling programs and other sources. Placon washes and processes the recyclable PET materials into sheet and flake for food packaging and sheet products for consumer products. The plant has created 47 new jobs and collects material primarily from the Midwest.

One of Placon’s product lines is Evolutions™, a new series of environmentally responsible deli containers ranging in size from 8 ounces to 32 ounces, designed for use with cold, ready-to-eat foods. The Evolutions deli line features easy open/easy close recyclable containers, made from 100 percent EcoStar recycled PET, a material derived from curbside collected PET bottles. The clear clamshell containers are used for cold, ready-to-eat deli foods including: pasta salads, fruit, vegetables, nuts, and candy. Placon also offers a comprehensive line of retail food packaging products made with EcoStar recycled materials including containers for bakery and produce such as Crystal Seal®, Fresh ‘n Clear™ containers, HomeFresh® deli containers, and Dimensions™

bakery containers. To date, close to one billion water and soft drink bottles have been diverted from landfills and converted into Placon's EcoStar packaging.

3-M Printpack, Inc. (Rhineland, WI)

Case Study:

- ◆ Flexible Film Printing Company

Sources:

- ◆ Interview with Bill Rubick (Printpack, Manager of Sustainability; HQ offices in Atlanta, GA) on August 15, 2012
- ◆ Printpack web site: www.Printpack.com
- ◆ Article in the Milwaukee Journal Sentinel (June 1, 2012)

Printpack is a major converter of flexible and specialty rigid packaging with an over fifty-year history of innovation. Founded in 1956 and headquartered in Atlanta, GA, USA, Printpack is a privately held manufacturer of flexible and specialty rigid packaging. Employing 4,220 associates worldwide, the company operates 28 manufacturing facilities in the United States, Mexico, the United Kingdom, Poland and China.

The Rheinlander facility is part of the "Snacks Division" and makes flexible packaging for candy and chips. Printpack, company-wide, is looking hard at sustainable content packaging, especially the use of plastics from renewable resources, bio-added resins and, potentially, recycled-content resins. Most of their existing recycling uses in-house plant scrap and the materials are not used in their packaging. They are concerned that:

- ◆ Post-industrial recycled plastic has too many additives that they cannot control.
- ◆ Ninety percent of the packaging they make is for the food industry, and this limits the recycled content that they can use.

The best options for this company to improve sustainability are in the resins that they manufacture products with; they are looking at sustainable sources, and bio-based resins. Printpack believes that ethanol-based polyethylene is as recyclable as any other polyethylene, especially if the recycled bio-poly is made into recycled HDPE.

Mr. Rubick stated that while they believe that the best value for the company is to use organic plastics and biopolymers, they have done research on other resins. They have found that the 3's, 4's, 5's and 6's are not useful in their film business. They specifically studied polypropylene and polystyrene, but found that it did not produce good quality packaging. These resins made packaging with a high gel content, and the packaging was cloudy, not clear as needed for retail applications. They found that a higher quality of material was needed for film food and retail applications; however, the polypropylene and styrene are fine for their injected or blow molded applications.

Printpack is building a new facility in Rhinelander in the fall of 2012 as part of its strategy of aggressive reinvestment to improve production efficiency. The transition to the new Rhinelander plant will take place in the second half of next year. The Rhinelander facility will result in additional capacity, as part of its expansion plans, Printpack will close its Hendersonville, NC plant and transition that business to the new facility in Rhinelander. Printpack is proposing to invest approximately \$72 million in the plant and equipment. It is estimated that the "brick and mortar" portion of the building will come at an expense of around \$32 million, with the remaining \$40 million being invested in new technology. Printpack will use a \$1.7 million loan and \$300,000 in tax credits for capital investment through the Wisconsin Economic Development Corporation (WEDC). In addition, WEDC and the Wisconsin Housing and Economic Development Authority will help Printpack obtain up to \$12 million in New Market Tax Credits to support the company's expansion. This support will help retain 138 jobs and add up to 12 more jobs in Rhinelander. "The decision to close Hendersonville was very difficult for us. However, our goal has always been to provide our customers competitively priced, high quality packaging materials, utilizing the best technology available. This new investment will enable us to continue to meet this goal," said Dennis Love, President and CEO. (Milwaukee Journal Sentinel, June 1, 2012)

3-N Trex

Case Study:

- ◆ National recycled plastic lumber manufacturer.

Sources:

- ◆ Interview with Dave Heglas (Trex, Director of Materials Resources; HQ offices in Atlanta, GA) on August 14, 2012
- ◆ Trex web site: www.Trex.com

Trex® is the nation's largest manufacturer of wood-alternative decking, railing and fencing and trim products. Trex lumber is made from reclaimed plastic and waste wood. Trex is one of the largest plastic bag recyclers in the U.S. Trex purchases approximately 300 million pounds of used polyethylene and an equal amount of hardwood sawdust each year, materials that would normally end up in a landfill. About three billion recyclable grocery bags were collected for use to manufacture Trex products in 2010. About 70 percent of all plastic bags recycled in the U.S. come from in-store, retail collection drop-off programs which are used as a source of recycled resin by Trex

Trex began as a division of Mobil Chemical. Trex Company's headquarters and a manufacturing facility are located in Winchester, VA. Trex Company also has a manufacturing facility in Fernley, NV.

Trex was born to answer the question, "What 'cha gonna do with all these bags?" Trex focuses on obtaining recycled material from commercial and industrial sources. About 10 to 15 percent of their material comes from grocery store returns (20 to 30 million pounds per year). About another 20 to 30 million pounds per year is from additional in-store film generation (e.g., shrink

wrap from pallets, etc.). Distribution centers are another significant source of supply. The balance of the supply is from industrial sources, other distribution centers, beverage and food warehouses and distributors (SYSCO, etc.), large vendors (P&G, SC Johnson), and automotive parts stores and suppliers, etc. Recyclable PE film can come from just about any user or distributor of anything wrapped with polyethylene or foam wrap.

There has been a great deal of consolidation in the plastic lumber manufacturing business. Originally, there used to be about 30 companies. Twenty years later, there are only four or five other end-use manufacturers of recycled lumber that are using that same materials supply. The other manufacturers may also use PVC or virgin resins to make plastic lumber. Trex's market share is about 30 to 40 percent of the plastic lumber market. No other company has more than a 15 percent market share.

Recycled dimensional lumber used to be the only end product. Today, companies are making railroad ties, guardrail offset blocks, parking lot bumpers, three-layer trash bags (the middle layer is reprocessed linear low density film) and paving stones.

The Trex recycling system includes the following steps:

1. Plastic bags and other PE film are dropped off at grocery stores or other collection centers.
2. The recyclables are backhauled to distribution centers. Trex supplies balers and trailers (if requested) at the distribution centers so that floor space doesn't need to be dedicated to recyclables.
3. Trex transports the materials to their recycling plant. Trex pays for the material as well as providing the baling and transportation.

Trex needs more, clean, dry materials: dry-cleaner bags, shopping bags, or any polyethylene film material. When discussing barriers to recycling additional material, Mr. Heglas emphasized the need to look from the back-end of the process. For example: Waste Management, Allied and other national waste management companies are really collectors and consolidators, not recyclers. An end-use "recycler" is someone that makes a product from the collected recyclables. To increase the plastics that are recycled, it is important to focus on the industries that can use recycled content, and have recyclers specify what to collect, how to sort it, and how it should be processed. The manufacturers should, in effect say, "Here is a type of plastic bale that "X" number of companies could use, in the amount of "Y" number of tons. Here are the specifications for the bale (e.g., percent fines, percent dirt, percent other resins or other additives). Collectors, go get this and put it in a bale."

Trex has found much of today's packaging is not recyclable because of multiple resin layers and additives to the resins. Trex needs polyethylene to make their lumber product function; polyethylene with nylon and EVA take the value from the recycled material, and the best end of life option becomes waste to energy. Examples of changes in packaging that have greatly reduced recyclability included:

- ◆ Trash bags used to be all polyethylene and were thick bags. To reduce the weight and the amount of polyethylene needed in the bags, bags have been thin walled. To put back the strength that was in the thicker bags, nylon barriers have been added to the bags. The nylon makes the bags very difficult to recycle.
- ◆ Pre-processed food packaging is designed to keep food flavor and freshness. To achieve this, ethylene vinyl acetate (EVA) is added to provide an odor barrier and enhance “clinginess”.

Multilayer plastics tend to be designed for very specific products. Trex is developing processes to mitigate the problems of multilayer films, but they are expensive. People need to recognize that the materials that do wonders for packaging are not necessarily recyclable. There has not yet been a co-evolution of packaging technology and recycling technology. Such co-evolution is needed.

It is difficult to know what additives are put into resins without knowing the source of the plastic. For instance, if the plastic came from bubble wrap, it typically has nylon additives, frozen food packaging has EVA and other barriers; pop/soda bottles have added vapor barriers to contain CO₂. He noted that the SPC label will be very important to future recycling efforts.⁵

There was a trend by MRFs to comingle bales, whereby an OCC bale had a film “center.” These bales ended up with too much contamination, as MRFs included a “little” bit of floor sweepings to the center, or “some” hangers in with the plastic layers, or miscellaneous organics in the OCC.

Trex noted that as recyclers, they can tolerate some contamination, as long as it is consistent contamination. For instance, if it is known that a certain vendor always has four percent contamination of film with rigid plastics, the sort line can be modified when that vendor’s material is processed to reflect this amount of contaminants. Contaminated bales these days can have garbage throughout one bale, and a clean bale is next, followed by a bale with 35 percent paper in the bale. This type of contamination cannot be handled in plastics re-processing systems.

Trex began plastic packaging recycling programs to answer the “what-to-do-with bags” question. Now that the percentage of plastic bags in the recycling stream is dropping, they are taking other types of plastic packaging. Plastic bags have not decreased in the retail trade, people are not taking responsibility for making sure that the packaging they love (convenient bags) are handled correctly after the use.

Mr. Heglas is a prominent member of several plastics trade associations that are progressing plastics recycling. When asked for his opinion on EPR, he stated that he has mixed views, but believes the European model, where everyone shares in the cost of the product life cycle is probably the way to go. He noted that when costs are shared, better results are seen. He gave

⁵ *Sustainable Packaging Coalition (SPC)*” program for How2Recycle.org, including a label for plastic bags and film: <http://www.how2recycle.info/>.

the example of the distribution centers where Trex collects plastics. Often, recycling in these centers is mandated by corporate directive. The individual center does not see a return for the work they do to collect plastics from grocery stores, or to separate and compact recycled plastic at the center. The corporate entity can receive millions of dollars per year for the plastics, but the distribution center doesn't see that, or know of the return on the time and effort investment. Trex's concept is a "WIN-WIN-WIN"...the corporate company can tout their recycling as a "green" initiative, they save disposal money and receive recycling revenue for the plastics collected, and everything that consumers bring into the stores, even if the plastics weren't generated in the store, brings revenue back to the distribution company.

Film Recycling Logistics:

Film has lots of surface area, and not much weight. 10 to 15 soda bottles or 100 bags make up a pound of material. Keeping film clean and dry is the key to cost-effective recycling; it is very expensive to clean and dry flake plastic. Trex tried a wash line in the US; it was not cost-effective. The film was initially filthy and it didn't dry well. In the end, the wash line was not sustainable. In Spain the Spanish government paid Trex to process curbside film which made the wash line cost-effective. When collecting film to recycle, it has to be kept separate, dry, and contaminants have to be minimal – then you have a valuable product. Curbside film in the US has proven to be trash.

The material that is coming back to grocery stores is growing very slowly. There has been no substantial increase in collections though in-store programs. The infrastructure exists, the material is just not coming to the stores.

There is no market for low-grade materials except exports, and export markets are now going away. Not even China will take the trash any more. Many markets are competing for clean grocery material; bidding wars are starting. The distributor that now goes to 20 Mom and Pop grocery stores needs to start to provide recycling services for the film that wraps the deliveries. Recycling services for these smaller retailers needs to be in place before a film ban is put in place.

What are the potential roles of government in recycling programs?

Mr. Heglas suggested the following when asked to identify potential governmental roles to increase recycling:

1. Gradual ban on materials that can be recycled; tax landfills, for instance, if they accept plastic film that could be recycled.
2. Provide businesses that use or manufacture goods with financial incentives if they use recycled content in the goods.
3. Consumers need to bear part of the cost of bags that are desirable to them, but that are not recycled.

4. There should be a waste to energy (WTE) option for dirty materials. WTE is preferable to landfilling, especially with high energy value, combustible waste materials.

Mr. Heglas was asked if agricultural (ag) bags could be better recycled in Wisconsin. He noted that anything that has contact with the ground has to be washed. The system that he referred to in Spain had to buy ag plastics, but because of the government participation, it was cost-effective. In the US, there is no way to cost-effectively wash the ag films. Trex has tried to wash the large quantities of film that are used for strawberry fumigation. Yields in that effort were less than 40 percent because of the dirt in the films. Trex sent the material to China to wash, and brought it back to the US to recycle. Dirty film puts a lot of wear and tear on washing and grinding equipment, and can pit or damage extrusion equipment.

Mr. Heglas noted that ag films would have potential for an extended producer responsibility (EPR) program. The installer could be required to take back the film after fumigation. He noted that grape drape and banana bags do not have dirt issues, but are still difficult to process. He also stated that some people are starting to experiment with the 27 layers of film that are put around cotton to transport it to the gins for de-seeding. There will need to be some type of incentives for ag plastics to be recycled. There is one company that is making plastic/rubber sidewalks, and targeting ag film for this use. Lindsey Smith, with TerraCycle⁶ is making 3 X 3 sidewalk squares.

“Green washing” is an issue for real recyclers. There needs to be an analytical evaluation of recycling, not just a marketing push.

3-0 Wisconsin Film & Bag (WF&B)

Case study topics:

- ◆ Reclamation and end-use manufacturing markets in Wisconsin
- ◆ Ability / capacity to recycle more types and volumes of plastics
- ◆ Policy options.

Information sources:

- ◆ Interview with Pete Emenecker on August 13
- ◆ DNR’s MRF reports
- ◆ WF&B’s web page: <http://www.wifb.com/>

WF&B’s main business line is blown film extrusions. They have 14 lines at the present time, and are putting in two more blown film lines. Eighty five percent of their product lines are clear films.

They have sorting lines to handle post-industrial material and have averaged 14 million pounds per year of post-industrial recycled plastic material for the past 15 years. Each shipment of

⁶ TerraCycle, Inc. web page: www.TerraCycle.com

plastic film is randomly inspected to determine the resin type and properties. WF&B uses specialized lab equipment that permits an exact analysis of the material to ensure the correct polyethylene resins are processed. Any material that fails inspection is rejected and returned to the film source. Once the material is tested for resin type, it is sorted prior to processing. This ensures that resins with similar properties are consolidated with like property resins.

WF&B's recycling department reprocesses post-industrial plastic into pellets. These pellets are introduced back into production to manufacture more environmentally friendly products including: non - Food and Drug Administration (FDA) applications, can liners, industrial type applications and WF&B's ECO Blend™ line of products. The WF&B ECO Blend™, recycled product line includes can liners, box liners, barrel liners. WF& B markets both ECO Blend™, their post-industrial recycled line, and ECO Blend™ - PCR, their post-consumer line. ECO Blend™ - PCR has 25 percent or more post-consumer recycled plastics. They have found these lines to be most competitive in lower-end products, such as liners for Gaylord boxes.

Recycled content products must compete on quality and price point; it is not practical to monitor percent recycled content as a consistent market requirement. The value of post-industrial plastic recycled material follows the trend of the virgin resin market, at 14 to 15 percent off of the virgin price. At this time, the post-industrial film market is in the mid-forties to low fifty cents per pound. More people can use post-industrial than post-consumer plastic film as it is easier to grind and put back into extruders. Post-consumer films are mostly marketed off-shore, and are in the range of eighteen to twenty-eight cents per pound.

WF&B is finalizing installation of a new, post-consumer processing system which will process an additional 14 million pounds per year. The Hairibault system will have a manual sort at the front, followed by separation of metal fragments, followed by a shredder, wash processes, drying and densification of the plastics. They have installed the post-consumer system because there is a significant post-consumer polyethylene resource out there that has great value that was not being recovered. The wash line, in particular, is very sophisticated because of the pressure-sensitive labels found on post-consumer recyclables. They have found that there is a large amount of material available, if it could be properly processed for their operation.

Obtaining quality recyclables is a significant problem for them. Because most of their products are clear films, color and printing on recycled films are serious contaminants for them. They work with recyclers, one-on-one, to obtain color-free and print-free materials. They noted that IROW is excellent at sorting recyclables, and provides a quality recyclable to them.

WF&B uses an A-B-C grading system that is not yet used industry wide.

- ◆ **Domestic A** is the cleanest material, with 1 – 2 percent contamination
- ◆ **Export A** is less clean, with 5 percent contamination
- ◆ **B and C grades** are a wild guess at contamination. These will have 20 to 25 percent bubble wrap and strapping tape, which are serious contaminants for WF&B's process.

Other contaminants that are issues for them:

- ◆ Nylon is a problem because of the different melt temperatures of nylon-containing plastics and because nylon-containing plastics retain moisture.
- ◆ Stretch film has a sticky coating on the surface which collects dirt and residues. These materials must go through a sophisticated wash line in order to be recycled.
- ◆ Ethylene Vinyl Alcohol (EVOH) and nylon in multilayered extrusions are a problem.

He's competing with composite wood companies who can take the grocery bags and the shrink wrap together. Mr. Emenecker believes that there are a lot of markets for grocery bags; for instance, it is not difficult to run them through an extruder to make structural construction materials. He noted that he can take the shrink wrap, but it has to be sorted; there is minimal sorting required for TREX to take the film plastics from the pallet companies. WF&B does not accept HDPE or colored materials that are in the grocery bag stream.

He noted that MRFs with star screens are trying to market the films (plastic bags) that they recover, but there has been little success in this, and that is why most MRFs are crabby about accepting plastic bags in curbside recycling programs. Many curbside film bales are viewed in the industry as "garbage," because of the contamination.

According to Emenecker, grocery bag bans do not fix the problem. There are lots of other bags out there, including dry cleaner bags and other film packaging.

The WF&B facility is able to use plastic bags in their post-consumer lines. Emenecker came to plastics from the paper recycling industry when he took co-transported stretch films as a favor (no cost) to his suppliers with OCC paper loads. Back then, he was able to market the stretch film bales at twenty cents per pound. Mr. Emenecker has been working with pallet companies to fill their dead truck space with shrink films and double up their loads. Back hauling commodities like film plastic can make sense for businesses.

WF&B is not looking at recycling organic or biodegradable bio-plastics, which they do not consider recyclable at this time. Mr. Emenecker has found that bio-plastics, or oxy-compostable plastics, are a significant contaminant to their supply stream. He works with the University of Wisconsin in their sustainability curriculum. He has not found enough people in the plastics development industry that sufficiently understand differences between aerobic and anaerobic digestion. These different "composting" processes will each handle biodegradable plastics differently.

Mr. Emenecker believes that more effort should be made in sustainability programs to tap into the plastics that are going to landfills instead of focusing on bio-plastics. If sugarcane is used to make plastics, it removes the cane from food production efforts, similar to corn and E85 or ethanol. The cane would be better used in food production, from a sustainability perspective, than in plastics where it causes recycling problems.

Getting a sufficient supply of film plastic to recycle is a significant problem for him. He noted that in states with bottle laws, they have gotten bottles into the recycling stream. Industrial plant managers don't understand that film is recyclable. He wants to do one million pounds per month of recycled material, but it is hard to obtain that for his facility. The material is out there, and is going to landfills; it is not being recycled. He is currently using 600,000 pounds per month, and is obtaining material from out-of-state including the East Coast, Chicago, Georgia, Tennessee and Missouri. Closer markets would allow him more control over quality, and significant cost savings. Mr. Emenecker noted that logistics are very important; recyclers need to be transporting OCC, paper, etc., with the film plastics. Plastics need centralized pickup points, because they are so light. He includes one cent per pound for transportation in his bid prices for film to recycle. All of his markets are spot markets; because the industry is so fragmented, long term contracts are difficult to set up.

The Flexible Film Recycling Group (FFRG) is an industry organization that is increasing awareness among all recyclers that there is value in film plastics, and that this is a good income stream. WF&B is proud to be a member of FFRG. There is a need for more efforts to get people to know that there is value in flexible film plastic recycling. Many people in manufacturing facilities know that they can recycle boxes; they need to know that they can recycle film, also.

Mr. Emenecker sees a tremendous need for education about film plastic recyclables. The new label that the Sustainable Packaging Coalition (SPC) is working on will help. He sees this helping to get bread bags and dry cleaning bags recycled. He believes the pictures on the proposed SPC poster will be a good start, as will the SPC label on the bags themselves. It's important to pick one film plastic to start with, and he believes that polyethylene is a good start. There is a lot of material out there, and it is easily recyclable. Meat and cheese packaging will be a real challenge because of the EVOH and nylon oxygen barriers in those films.

When asked about ways to improve recycling in Wisconsin, Mr. Emenecker noted that more regulations will not be productive. Incentives make sense, especially to small companies. He obtained a low interest loan and training grants for his recycling facility improvements; this will generate 15 jobs immediately and 27 total jobs when the new lines are in full production. He noted that polyethylene is the easiest plastic to pick out of the waste stream. When companies make decisions, they look at the bottom line. Incentivize Recycling! He understands that creating a culture shift to get people to know they can recycle instead of landfilling is steering a pretty big ship. His company works the bottom line, and they recycle everything, including the dust on the floor. Through his work with other companies and with the University of Wisconsin, he sees companies that dispose of potentially recyclable material because they don't see a need to recycle to help their bottom line. Again he noted that back hauling and avoiding landfill fees make sense to business, they just don't know what is possible. If Wisconsin wants to increase recycling, recycling processing, and manufacturing with recycled content, make more information widely available.

He noted that it is difficult to find information about programs to help small businesses grow. Many recyclers are small; they don't have capital resources to expand. It would help them if the process to seek assistance was less intimidating, and if there were more local resources to reach out to them. He noted that people need to know that they're going to save money, education

efforts need to let them know that doing the right thing will save them money. He noted that many plant managers and consumers think that they know about recycling, but they don't. This is why he works with industry trade groups like the SPC and FFRG, but the information that they are putting out needs wider distribution.

Mr. Emenecker, when asked why WF&B got into recycling, replied that it was, "a smart play by the managers." Vertical integration (having the recycling processing and manufacturing together) helps them control feed stock sources and volatility in pricing, since virgin polyethylene prices are widely variable. Recycling offers them a competitive advantage, in that they can offer lines of products that other companies don't. Finally, they promote the sustainability of their products and their use of materials that would otherwise be in the waste stream.

WF&B is evaluating the feasibility of recycling agricultural films. Currently they are looking for 5,000 to 10,000 pounds of ag film to use in a trial. Ag bags need a wash line. He anticipates that if they can process and clean this material, they would use 80 percent internally and use the other 20 percent for something else. They see this as a way to completely utilize the investment in their wash line.

Mr. Emenecker was asked if a "Plastics Exchange" targeting Wisconsin companies would be helpful. He noted that the FFRG and PlasticBagRecycling.org (soon to be rebranded as PlasticFilmRecycling.org) is already working to perform this function nationally. Plasticmarkets.org was supported with funding from U.S. EPA, but the data base needs to be populated with plastics for sale, and plastics needed. He noted that getting the information "out there" is critical, and that this will probably need to be done company-by-company and state-by-state. He believe that it will be best if everyone lines up and works with the sites that are out there, instead of creating many new sites; too many sites for exchanging plastic recyclables would be confusing.

Lists of Markets and MRFs:

3-P List of Markets Located in Wisconsin (Private Only)

Introduction

This list includes all known plastics recycling markets located in Wisconsin. This list was compiled from a variety of sources including:

- ◆ DNR reports;
- ◆ UW-Extension SHWEC program's *Wisconsin Recycling Markets Directory* (<http://www4.uwm.edu/shwec/wrmd/search.cfm>);
- ◆ Moore Recycling Associates database of plastics recycling markets;
- ◆ Other states' recycling directories;
- ◆ Industry publications (e.g., *Plastics News*; etc.);
- ◆ Manta business listings (<http://www.manta.com/mb>); and
- ◆ Other sources.

This list is intended to focus on the private reclaimers and end-use manufacturers using recyclable plastic collected in Wisconsin. Haulers, MRFs, and scrap dealers that do not further clean, wash, shred, grind or pelletize the material (e.g., make a recycled resin) are not included. (See Appendix E-J.2 for a separate list of recyclable plastics MRFs and other "Handlers".)

Disclaimer: This list does not constitute any form of endorsement or recommendation for use of these companies as markets for plastics recycling. Suppliers of recyclable plastic must contact the market directly to discuss any proposed sale or delivery. The list is for informational and educational purposes only as part of the DNR *Plastics Recycling Study*. The information is as accurate as possible, given the wide range of sources used. Any error or omission is unintentional. Additions or corrections are always welcome.

Ace Plastics, LLC (North Prairie, WI)

Category: Reclaimer, Manufacturer

Types of Plastics: All types (primarily post-industrial scrap)

Contact: Charles Beranek, Owner
113 North Oakridge Dr., 53153
(262) 392-5177

aceplastics@centurytel.net

<http://www.aceplasticsrecycling.com/>

<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=56>

Company web page description: Ace Plastics LLC specializes in plastics recycling programs for domestic and international consumer accounts. We recycle virtually all types of plastic scrap, including PP, PS, PS Sheets, PE, PET, ABS, HMW-HDPE, Nylon, PC, ACRYLIC and HIPS. The material comes in many forms including buckets, barrels, pallets, etc. We also supply manufacturers with clean-quality regrind at highly competitive prices.

Manta's web page description: Ace Plastics in North Prairie, WI is a private company categorized under "Mold Makers". Manta's records show it was established in 1997 and incorporated in Wisconsin. Products or services: medical injection molding, precision injection molding, ceramic injection molding, automotive injection molding and other injection molding.

Applied Plastics, Inc. (Oak Creek, WI)

Category: Manufacturer

Contact: 414.764.2900

customerservice@appliedplasticsinc.com

<http://www.appliedplasticsinc.com/quality/our-process>

D.R. Plastics, Inc. (Delavan, WI)

Notes: Shredding, grinding, and repelletizing services. Has a warehouse, distribution (including rail haul) and storage capabilities. Has extrusion and converting capabilities and custom and stock polyethylene film and bags.

Category: Reclaimer

Contact: Russ Blakeley, President
1501 E Wisconsin St, 53115
262-728-5990

info@drplastics.net

<http://www.drplasticsinc.com/>

<http://www.drplasticsinc.com/Plastic-Recycling.html>

"D. R. Plastics, Inc. began in 2005 in response to the need of our affiliated plastic company to handle their internally generated scrap. It quickly became evident that the recycling of scrap plastic is a universal issue that needs to be addressed. All manufacturing companies struggle with the production of scrap and how to most efficiently handle it. This opportunity formed the basis for D. R. Plastics' business plan-provide scrap recycling services to manufacturers and packaging companies within the plastic industry.

dba "Eco-Tech" / Ecological Concepts, Inc. - Wisconsin (Burlington, WI)

Notes: 10,000,000 in sales as per Plastic News article:
<http://plasticsnews.com/rankings/listrank.html?mode=ppt>

Category: Reclaimer
Types of Plastics: HDPE bottles, LDPE bottles
Contact: Joe Sadlier, Owner
6455 S. Pine St., 53105
262-539-3811
ectch@aol.com
www.eco-tech.ws

"We manufacture plastic lumber from recycled plastics without using wood, turning waste problems into productive solutions. Eco-Tech comes into the picture by purchasing those materials included in category 2 (HDPE) and some 4 (LDPE). Eco-tech usually receives those materials in large, rectangular bales wrapped in wire. These bales are four to six feet tall. Eco-Tech receives them at our recycling center in Genoa City, WI. There the bales are fed into a bale breaker that removes the wire and breaks the bales into smaller pieces. These pieces are then fed into a grinder, which grinds the material into pieces of about a quarter of an inch. The ground material is conveyed to a wash system which cleans the product and removes any contaminants heavier than water. Most of the water is then removed by ancillary equipment. It is then loaded into gaylords (large boxes) and transported to our extrusion facility in Burlington, WI. There the material is dried and fed to our extruders. The extruders melt the plastic and form it into our plastic lumber, etc. During this extrusion process, it is heated to a temperature high enough to melt the plastic which is also high enough to sterilize the material of any bacteria. Eco-Tech packages the material for shipment to our customer either flat or in coils for space savings. Our customers install them in truck boxes as liners or as scuff boards or use them to manufacture decking, fencing, furniture, etc. Basically it is used as a green replacement for wood products."

Manta's web page description: Eco-Tech is a manufacturing company. It produces high quality plastic lumber from post consumer waste, and sells this lumber to many industries.

Business Categories:

Wholesale Recycled Products in Burlington, WI; Plastics and Plastic Products Manufacturers; Patio Porch and Deck.

Deltco of Wisconsin, Inc (Ashland, WI)

Notes: Found on PN list of May 21, 2012

Category: Reclaimer
Contact: Dan Metler, President
601 Industrial Park Road, 54806
715-682-9007

Manta's web page description: Deltco Of Wisconsin, Inc in Ashland, WI is a private company categorized under Plastics Processing. Manta's records show it was established in 2000 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$4,000,000 and employs a staff of approximately 35. Products or Services: Collect post-industrial scrap, process it, and sell as grind, desified or pelletized recycled plastic.

EVCO Plastics - DeForest (AMP and MED) (DeForest, WI)

Contact: 100 W. North Street
DeForest, WI 53532
800-507-6000
<http://www.evcoplastics.com/>

"We are a global custom plastic injection molder of thermoplastic resins with mold design and mold building. Our ten manufacturing facilities, strategically located throughout the U.S., China and Mexico, employ over 800 people and operate 140 injection molding presses ranging from 28 to 3,300 tons."

Manta's web page description: Evco Plastics in De Forest, WI is a private company categorized under Mold Makers. Current estimates show this company has an annual revenue of unknown and employs a staff of approximately 250 to 499. Products or Services: Medical Injection Molding, Precision Injection Molding, Ceramic Injection Molding, Automotive Injection Molding and Injection Moulding.

EVCO Plastics - Oshkosh (Oshkosh, WI)

Contact: 100 West North St.,
Oshkosh, WI 53532
<http://www.evcoplastics.com/>

"We are a global custom plastic injection molder of thermoplastic resins with mold design and mold building. Our ten manufacturing facilities, strategically located throughout the U.S., China and Mexico, employ over 800 people and operate 140 injection molding presses ranging from 28 to 3,300 tons."

Manta's web page description: Evco Plastics in Oshkosh, WI is a private company categorized under Injection Molded Finished Plastics Products, Nec. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$10 to 20 million and employs a staff of approximately 50 to 99.

Flexible Foam Products, Inc. (Portage, WI)

Types of Plastics: Polyurethane/Flexible Foam

Contact: Mike McVicker,
2626 Murphy Road,
608-745-4650
<http://flexiblefoam.com/>

"Flexible Foam Products, Inc. is a national manufacturer of polyurethane foam and carpet cushion products. We have been making your world more comfortable and serving our customers in the flooring, bedding, furniture, packaging, retail, and automotive industries for over 40 years."

Flexible Foam Products Inc in Portage, WI is a private company categorized under Foam Rubber. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$20 to 50 million and employs a staff of approximately 50 to 99.

"Company Overview: Flexible Foam Products, Inc. manufactures polyurethane foam products. Its products include carpet cushions which help in repelling bacteria and fungi growth and reducing odors and stains in home and workplace; AdaptaFlex™

IROW (formerly: Industrial Recyclers of Wisconsin) (Mosinee, WI)

Category: Reclaimer

Types of Plastics: Polyurethane/Flexible Foam, "Plastic Bottles & Containers" (from IROW web page); "Plastic pails, Industrial scrap plastics, Stretch wrap" (from IROW Recycling fact sheet).
"Plastics – Plastics #1, #2, PET and HDPE bottles with caps removed and rinsed.

Contact: Cory Tomczyk, President & Owner
1040 Indianhead Dr, 54455
(715) 693-7123
cory@irow.bz
<http://www.irow.bz/>
<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=802>

"IROW now offers Shredding, Recycling and Waste Services to Marathon, Wood and Portage Counties.

See also "Case Study" 3J

Luetzow Industries (South Milwaukee, WI)

Contact: 1105 Davis Avenue, 53172
(414) 762-0410
<http://luetzowind.com/>

" ... a basic extruder and manufacturer of plastic bags since 1956. factory direct the finest and highest quality plastic bags, Luetzow saw a need for total automation to lower the cost of plastic polyethylene film, constructed the worlds first totally automated plastic polyethylene extrusion plant. Today - Luetzow Industries direct selling coupled with total automation, produces consistent perfect quality plastic polyethylene garment bags, laundry & dry cleaning bags, trash bags, dental chair covers & bags, cot and casket covers, tubing and sheeting at the lowest price. "

Business Categories: Mfg Plastic Product;s Mfg Unsupport Plstc Film; Mfg Plstc Material/Resin Mfg; Plstc/Coat Paper Bag. All Other Plastics Product Manufacturing. Luetzow ... is a private company categorized under Plastics Containers, Except Foam. Manta's records show it was established in 1953 and incorporated in Wisconsin. Products or Services: Cargo Containers, Collapsible Containers, Containers, Cremation Containers and Custom Containers.

MidWest Manufacturing (Eau Claire, WI)

Notes: Product manufacturing subsidiary of Menards: "UltraDeck".

Contact: Denny Volbrecht, Manager
5311 Kane Road, 54703
(715) 876-5555
www.MidwestManufacturing.com

"... UltraDeck composite decking uses state of the art equipment to specially blend plastic and recycled wood fibers for its composite decking materials. ..."

Business Categories: Wood & lumber stores; Ret lumber/building materials; Other millwork including flooring. Midwest Manufacturing in Eau Claire, WI is a private company categorized under Wood and Lumber Stores. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company employs a staff of approximately 250 to 499.

Midwest Plastics Products, Inc. (Jefferson, WI)

Category: Reclaimer

Contact: Gary Fish, President
201 W Plymouth St, 53549
920-674-2752
dlucas@draintile.com
<http://www.midwest-plastic.com/>

"... a manufacturer of quality blow molded products. ... With an in-house recycling operation utilizing post consumer plastic (Midwest Plastics Products) ... offers exceptional value over our competitors. Our presses range in size from 5 - 35 lb head capacity giving us the versatility to mold small to large parts. ... Midwest Plastics Products molds custom and stock fittings for 3" through 6" corrugated high density polyethylene (HDPE) pipe including fittings and catch basins and retention systems.

Business Categories: Mfg Plastic Products; and All other plastics product manufacturing. Midwest Plastic Products is a private company categorized under Plastics Processing. Manta records show it was established in 1985 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$2,100,000 and employs a staff of approximately 20.

N.E.W. Plastics Corp. (Luxemburg, WI)

Notes: (See also "ReNEW Plastics")] 3rd phone: (920) 845-1818; 4th: (920) 845-2439

Contact: Mike Rikitzke,

P.O. Box 480, 54217-0480
920-845-2326
mrekitzke@newplastics.com
<http://www.renewplastics.com/>
<http://www.environmentfirst.info/>

"N.E.W. Plastics Corp. has been a leader in sustainable plastics technology since 1968 when our founder, Irvin Vincent, first began exploring the possibility of recycled plastic. N.E.W. Plastics Corp. manufactures containers, plastic lumber, and components made from other prime and recycled material. The company's annual sales are \$35 million and growing. Privately held and family-owned for two generations, N.E.W. Plastics Corp. has been a leading innovator in plastics and recycling technology for more than three decades. The company has three distinct business units: (1) N.E.W. Plastics Corp. Custom Blow Molding - PVC- and BPA-Free injection and extrusion blow-molding; (2) VBS Total Packaging LLC - Distributor/packaging support and supplies; and (3) RENEW Plastics - PVC- and BPA-Free extruded plastic lumber and components."

"N.E.W. Plastics Corp. is committed to sustainable manufacturing. "Pioneers in Plastic ~ Leaders in Sustainability." N.E.W. Custom Blow Molding unit, .. like 3D modeling RENEW Plastics unit. Business Categories: Plastic bottles manufacturers (Luxemburg, WI); Plastics and plastic products manufacturers; Unsupported plastics profile shapes.

See also "Case Study" 3K

Norm Arendt Brokers (Middleton, WI)

Contact: 6630 Clovernook Road, 53562
(608) 345-1412
<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=283>

PET, HDPE (injection + blow molded), PVC, polycarbonate, Industrial plastics, other plastics.
We broker the sale and purchase. We do not store nor purchase directly.

Pactiv Corp (Chippewa Falls, WI)

Category: Reclaimer, Manufacturer,

Types of Plastics: Acrylonitrile butadiene styrene ABS alloys, Acetal polymer, Acrylonitrile Styrene Acrylic ASA, Acrylonitrile Styrene Acrylic ASA alloys, Fluoropolymers PTFE, Liquid Crystal Polymer LCP, Polyamide Nylons PA, Polybutylene Terephthalate PBT, Polycarbonate PC

Contact: 1500 W River St, 54729-1954
715-723-9145
(Company headquarters: Lake Forest, IL)
www.pactiv.com

"Pactiv is a leading provider of foodservice/food packaging in North America. Our lines include products used by the supermarket, packer/processor, institutional, foodservice, and restaurant industries. World's largest manufacturer of Foodservice Disposables and Food Packaging; 55 manufacturing facilities worldwide (7 countries); 12,300 employees; 1,600+ customers; 17,000 SKU's; 10 material types; 8 manufacturing platforms."

Business Categories: Plastics processing; Mfg plastic products; mfg plastic materials/resins; and Coated & laminated packaging materials mfg. Pactiv Corp in Chippewa Falls, WI is a private company categorized under Plastics Processing. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$100 to 500 million and employs a staff of approximately 250 to 499.

Penda Corp. (Portage, WI)

Category: Manufacturer

Contact: Chase Harvey, Marketing Coordinator
2344 W. Wisconsin Street, 53901
608-742-5301 x78
pendahr@penda.com
www.Penda.com

"At Penda, market-leading truck bedliners are just the beginning of the great product possibilities we can help you bring to life through heavy-gauge thermoforming. From the sophisticated molded-in-color vehicle components to smart solutions for industries as diverse as water management, the thermoforming experts at Penda deliver."

Business Categories: Wholesale automobile parts and supplies; Whol auto parts/supplies; and All other plastics prod manufacturing. Penda Corp is a private company categorized under Wholesale Automobile Parts and Supplies. Manta's records show it was established in 2000 and incorporated in Wisconsin. Current estimates show this company employs a staff of approximately 250 to 499. Products or Services: auto parts.

Placon Corporation (Madison, WI)

Category: Manufacturer

Types of Plastics: PET Bottles, clear

Contact: Dan Mohs,
6096 McKee Road, 53719
608-271-5634
package@placon.com
<http://www.placon.com/about/>
<http://placon.com/>

... one of the nation's leading thermoformed packaging resources in the food, consumer packaged retail, and medical device markets. EcoStar®, our line of environmental packaging and rollstock material; Stock products; Customized package design, production and implementation; ... our mission is simple: "Our products work hard to sell yours."

We are a plastics thermoformer for the retail, medical, and food markets. Business Categories: Vacuum and pressure forming plastics manufacturers; All other plastics prod. Placon Corp is a private company categorized under Vacuum and Pressure Forming Plastics Manufacturers. Current estimates show this company has an annual revenue of \$50 to 100 million and employs a staff of approximately 250 to 499. Products & Services: Square deli containers; Custom retail packaging; and Stock retail packaging.

See also "Case Study" 3L

Plymouth Foam, Inc. (Plymouth, WI)

Category: Manufacturer

Types of Plastics: EPS

Contact: 1800 Sunset Drive, 53073
920-893-0535
www.plymouthfoam.com

"Plymouth Foam Inc, founded in 1978, has become one of the nation's leading converters of EPS (expanded polystyrene) and flexible foams for a variety of market segments, including, but not limited to: Packaging; POP Displays; Food Industry (retail, commercial, grocery,

manufacturers); Cold-Chain Medical (molded or laminated insulated shipping containers); Toys; and Custom laminated products."

Business Categories: Insulation materials manufacturer for both cold and heat; Mfg plastic foam products. Urethane & Other Foam Prod Manufacturing. Plymouth Foam Inc in Plymouth, WI is a private company categorized under Insulation Materials-Cold and Heat-Manufacturers. Manta's records show it was established in 2005 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$20 to 50 million and employs a staff of approximately 100 to 249.

Printpack, Inc. (Rhineland, WI)

Contact: 114 West Kemp Street, 54501
715-361-7100
www.Printpack.com

"Printpack is a major converter of flexible and specialty rigid packaging with an over fifty-year history of innovation. Printpack is an authorized converter of DuPont™ Tyvek® for Medical Device Packaging. ...

Printpack Inc in Rhineland, WI is a private company categorized under State Credit Unions, Not Federally Chartered. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$50 to 100 million and employs a staff of approximately 100 to 249

See also "Case Study" 3M

Recycled Plastics Industries (Green Bay, WI)

Category: Manufacturer

Types of Plastics: HDPE

Contact: Patrick Richard, Sales
3110 Market Street, 54304
920-330-9050
Patrick@rpi2.com
<http://www.rpi2.com/>

“Recycled Plastics Industries (RPI) manufactures plastic lumber from recycled HDPE not incorporating any fillers such as wood fiber or wood flour. The recycled plastics utilized in our plastic lumber is a combination of post industrial, post consumer regrind and wide-spec (industrial by-product).”

Recycled Plastics Industries in Hobart, WI is a private company categorized under Lumber: Rough, Sawed, or Planed. Manta's records show it was established in 2003 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$10 to 20 million and

Rehrig Penn Pacific Logistics (Pleasant Prairie, WI)

Category: Manufacturer, Reclaimer

Types of Plastics: Mixed Bales, plastic types #1 through #7; Stretch film; Plastics pallets;

Contact: Chris Morley,
7800 100th Street, 53158
303-666-6162
cmorley@rehrigpenn.com
<http://rehrigpenn.com>

“We begin by performing an in-depth audit of your entire supply chain to determine what type of materials can be recycled. We make recycling easy by handling all aspects of your waste stream, reducing expensive haul rates, and allowing you more time to concentrate on your core business. The Rehrig advantage allows us to pair pallet services with recycling services, reducing the need to keep a storage trailer on site or hold materials on your dock until they can be picked up.”

Rehrig Penn Logistics in Tomah, WI is a private company categorized under Wholesale Pallets and Skids. Current estimates show this company has an annual revenue of \$20 to 50 million and employs a staff of approximately 20 to 49.

ReNew Plastics (See "N.E.W. Plastics Corp." above) (Luxemburg, WI)

Notes: [Refer to "N.E.W. Plastics Corp.)

Category: Manufacturer

Types of Plastics: HDPE

Contact: P.O. Box 480, 54217-0480
920-845-2326

<http://www.renewplastics.com/>
<http://www.environmentfirst.info/>
<http://www.vbstotalpackaging.com/>

Shadow Plastics, Inc. (Rice Lake, WI)

Contact: 2301 Pioneer Ave., 54868
(715) 234-9186
<http://www.shadowplastics.com/>
<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=521>

“Shadow Plastics is your premier source for the highest quality custom bags and plastic film products.”

Shadow Plastics Inc in Rice Lake, WI is a private company categorized under Bags-Plastic Manufacturers. Manta's records show it was established in 1970 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 20 to 49.

T.A. Solberg Co., Inc./Trigs Recycling Center (Minoqua, WI)

Contact: <http://stevens-point.trigs.com/company/>

Tulip Corp. (Milwaukee, WI)

Notes: Used to recycle the 18-gallon curbside bins

Category: Manufacturer, Reclaimer
Contact: Alan Schmidt, Senior VP of Sales and Marketing
714 East Keefe Ave., 53212
414-963-3120
aschmidt@tulipcorp.com
<http://www.tulipcorp.com>

“From custom products to battery components, the applications of Tulip's Molded Products Division are as wide ranging and diverse as the many materials used in thermoplastic injection molding. With plants supported by a modern Technical Center in Milwaukee, Wisconsin, the Molded Products Division is ideally suited to serve its varied markets.....”

Business Categories: Plastics processing; Mfg plastic products; Mfg dies/Tools/Jigs/Fixtures; All other plastics. Tulip Corp in Milwaukee, WI is a private company categorized under Plastics Processing. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$100 to 500 million and employs a staff of approximately 500 to 999. Products or Services: Plastic Molding Manufacturing, Plastic Packaging Manufacturing, Plastics Product Manufacturing, Plastic Manufacturing Services and Plastic Toy Manufacturing.

Wisconsin Film and Bag (Shawano, WI)

Category: Reclaimer, Manufacturer

Types of Plastics: Film

Contact: Peter Emenecker, Director of Sales and Marketing
3100 E. Richmond St., 54166
715-524-2565
peteemenecker@wifb.com
<http://www.wifb.com/>
<http://www.wifb.com/index.html>

“Wisconsin Film & Bag (WF&B) is a custom manufacturer of mono-layer polyethylene bags and film ranging from large pallet covers to shrink bundle film and shrink bags. WF&B has high performance film extrusion, in-line bag converting and state of the art blending systems to create specialty blends “

Business Categories: Bags-plastic manufacturers; Mfg bags-plastic/coated paper; All other plastics. A private company categorized under Bags-Plastic Manufacturers. Manta's records show it was established in 1993 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$20 to 50 million and employs a staff of approximately 100 to 249.

See also “Case Study” 30

3-Q List of Wisconsin MRFs and Other Handlers

List of MRFs and Other “Handlers” Located in Wisconsin (Public and Private; But not included as “Markets” in Appendix 3-P)

Introduction

This list includes all known plastics recycling markets located in Wisconsin. This list was compiled from a variety of sources including:

- ◆ DNR reports;
- ◆ UW-Extension SHWEC program’s *Wisconsin Recycling Markets Directory* (<http://www4.uwm.edu/shwec/wrmd/search.cfm>);
- ◆ Moore Recycling Associates database of plastics recycling markets;
- ◆ Other states’ recycling directories;
- ◆ Industry publications (e.g., *Plastics News*; etc.);
- ◆ Manta business listings (<http://www.manta.com/mb>); and
- ◆ Other sources.

This list is intended to focus on the public and private organizations handling recyclable plastic collected from Wisconsin. Reclaimers and end-use manufacturers that further clean, wash, shred, grind or pelletize the material are not included in this “Handlers” list (See Appendix E-J.1 for a separate list of Wisconsin recyclable plastics “Markets”).

Disclaimer: This list does not constitute any form of endorsement or recommendation for use of these companies as markets for plastics recycling. Suppliers of recyclable plastic must contact the market directly to discuss any proposed sale or delivery. The list is for informational and educational purposes only as part of the DNR *Plastics Recycling Study*. The information is as accurate as possible, given the wide range of sources used. Any error or omission is unintentional. Additions or corrections are always welcome.

Arcadia/Alma Recycling (Arcadia, WI)

Category: Multi-material MRF, Drop Off

Types of Plastics: HDPE - blow molded; HDPE - injection molded; PET; Stretch/Shrink wrap

Contact: Robert Sonsalla,
1420 Wanek Ave., 54612
(608) 323-3385
bob_sonsalla@hotmail.com
[Website unavailable]
<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=961>

Manta's web page description: Arcadia Recycling in Arcadia, WI is a private company categorized under Recycling, Waste Materials. Manta's records show it was established in 1985 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$93,000 and employs a staff of approximately 1.

Argyle Recycle Center (Argyle, WI)

Contact: 105 Mill St, Argyle, WI - 53504 - 5350
(608) 543-3313

Aronson Recycling Co. (Waupin, WI)

Category: Multi-material MRF

Types of Plastics: Stretch/Shrink wrap

Contact: 513 Fond du Lac St., 53963
(920) 324-2209
<http://www.aronsonrecycling.com/>

Company web page description: "Our recycling yard purchases Ferrous (Iron) and Non-Ferrous scrap metal of all grades. We also recycle certain types of paper & corrugated cardboard, plastics, foam pad, and precious metals. Additionally, we offer container services and remote scrap pickup with semi trailers. Our facility has magnet cranes, grapple cranes, and mobile hydraulic shears to serve you."

Manta's web page description: Aronson Recycling CO in Waupun, WI is a private company categorized under Wholesale Scrap Metals and Iron. Manta's records show it was established in 1999 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$2.5 to 5 million and employs a staff of approximately 5 to 9.

Carroll Brothers Recycling Inc. (Hustisford, WI)

Contact: 120 Anthony Street Hustisford, WI 53034
(920) 349-3688

Manta's web page description: Carroll Brothers Recycling Inc in Hustisford, WI is a private company categorized under Recycling, Waste Materials. Manta's records show it was established in 1988 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$820,000 and employs a staff of approximately 8.

Chicago Iron & Supplies (Ashland, WI)

Contact: <http://www.chicagoironandsupply.com/>

Chicago Iron & Supply Inc is one of the leading scrap metal and steel distributors here in Ashland, WI. We have been serving Northland for over 50 years and our years of experience have built our company a reputation as a dependable resource to deliver quality products and services you require.

Learn More About Chicago Iron & Supply Inc:

- Scrap metal recycling center
- Retail steel
- Welding

Contact Chicago Iron & Supply Inc today at 715-682-3011 for more information

Commercial Recycling Corp (Medford, WI)

Contact: W6779 State Hwy 64, 54451
(715) 748-2970
<http://www.comrecycling.net/>
<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=321>

"Commercial Recycling Corporation is located in Medford Wisconsin and has been in the recycling business for over 30 years. We provide quality service to businesses in Wisconsin. Commercial Recycling Corporation is a recycling industry leader, designing service programs to best suit our business customer's recycling needs. Let us help you set up an efficient program for your cardboard, office paper, plastic, magazines, newspapers, and many other recyclable materials. Film/bags; HDPE - injection molded; Industrial plastics; LDPE; PET; PVC; Stretch/shrink wrap; Packaging peanuts.

Eagle Waste & Recycling, Inc. (Eagle River, WI)

Category: Multi-material MRF

Types of Plastics: PET, HDPE, LDPE, PP, Other

Contact: Alan Albee,
604 Jack Frost St. PO Box 729, 54521-0729
(715) 477-0077
<http://eaglewasteandrecycling.com/>

"Providing residential, commercial and industrial trash and recyclables collection and disposal for many Northern Wisconsin communities....."

HDPE - blow molded; HDPE - injection molded; PET; PP; Plastics - other.

Manta's web page description: Eagle Waste & Recycling Inc in Eagle River, WI is a private company categorized under Garbage Collection. Current estimates show this company has an annual revenue of \$500,000 to \$1 million and employs a staff of approximately 5 to 9.

EcoSource Corp. (Green Bay, WI)

Contact: Joe Cornell, Operations Executive
300 7th. Street, 54304
(920) 435-2644

<http://www.gp.com/greenbay/environmentalinfo.html>

Georgia Pacific: "Our EcoSource paper sorting operation diverts waste from public landfills."

Plastic pallets; Film/bags; HDPE - injection molded; Industrial plastics; LDPE; PET; PP; PVC; Polycarbonate; Stretch/Shrink wrap

Manta's web page description: Ecosource Corp in Green Bay, WI is a private company categorized under Recycling, Waste Materials. Our records show it was established in 1997 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 10 to 19.

Products or Services: Filter Recycling Services, Cardboard Recycling Services, Orange Recycling Services, Computer Recycling Service and Residential Recycling Services.

Faherty, Inc. (Platteville, WI)

Category: Multi-material MRF

Contact: 1120 Broadway, 53818
(800) 848-4591

<http://www.fahertyincorporated.com/>

<http://www4.uwm.edu/shwec/wrmd/details.cfm?recycler=43>

"We provide prompt, dependable and reliable recycling and waste collection services to residential, commercial and industrial customers throughout Grant, Crawford, Iowa and Lafayette Counties. ... "PLASTICS: Household container plastics # 1 through #7 are recyclable. Plastic items that are not recyclable include: Formed styrofoam and packing peanuts, plastic bags and oil bottles. Due to its light weight, plastic can be bagged for ease of collection and litter prevention. Please remove and discard lids and always remember to rinse containers clean."

Faherty Inc in Platteville, WI is a private company categorized under Garbage Collection. Manta's records show it was established in 1900 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$2.5 to 5 million and employs a staff of approximately 20 to 49. Products or Services: Rubbish Removal, Garbage Trash Removal, Waste Hauling, Garbage Service and Junk Removal Service.

Great American Disposal Recycling Facility (Quinnesec, WI)

Contact: W7702 US Hwy 2,
Quinnesec, WI 49876
906-774-5680

<http://greatamericandisposal.com/recycling/recycle-center/>

Hilltopper Refuse and Recycling Service, Inc. (Onalaska, WI)

Category: Multi-material MRF,

Types of Plastics: #1 and #2 Plastics (Bottle Form) [per company web page:
http://www.hilltopperrefuse.com/Recycling_Center_Onalaska_WI.html]

Contact: (608) 406-2542
gh@hilltopperrefuse.com
<http://www.hilltopperrefuse.com/>

“Hilltopper Refuse & Recycling Service has been a leader in waste and environmental service since 1984. Our business is family owned and operated to give you the best personalized service, whether you're a residential or commercial customer. This personalized service ensures consistent and exemplary refuse pickups throughout our operating area. We are always here to help residential and commercial clients with their bulk recycling demands.

The team at Hilltopper Refuse & Recycling Service is composed of quality service-driven individuals who perform on the highest levels. We are strongly committed to excellence in each service that we provide, making sure we always represent professionalism. At our recycling center, customer service is a high priority and we rely on it to retain our current business, as well as bring us new customers.

Our Recycling Center Offers:”

Roll-off Services

- Roll-off Containers (12-40 YD)
- Construction Containers
- Compactor Installation (Including Sales & Service)
- Lower Disposal Rates on Clean Wood & Shingle Loads
- Rebates up to 5% for Large Volume Accounts Rear Load Services
- Rear Load Containers (1-6 YD)
- Construction Containers
- Special or Regular Pickup
- Large Volume Rebates

Recycling Services

- Carts for Glass, Tin, & Aluminum
- Appliance Recycling/Hauling
- Complete Paper Recycling
- Plastic #1 & #2
- Light Bulb Recycling
- Material Recovery Facility

Business Categories: Garbage Collection and Transport, No Disposal in Onalaska, WI Refuse Collection & Recycling Center Other Waste Collection. Hilltopper is a private company categorized under Garbage Collection and Transport, No Disposal. Manta's records show it was established in 1981 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$2.5 to 5 million and employs a staff of approximately 20 to 49. Products or Services: Sanitary Services, Garbage Removal, Pickup Trash, Recycling Trash and Junk Removal Service.

**Johns Disposal Service, Inc.
(Franksville, WI)**

Contact: <http://www.johnsdisposal.com/>

"A family business since 1969, Johns Disposal Service currently serves the counties of Dane, Jefferson, Kenosha, Milwaukee, Racine, Rock, Walworth and Waukesha."

**Johns Disposal Service, Inc.
(Whitewater, WI)**

Category: Multi-material MRF,

Contact: Brian Jongetjes, President
262.473.4700
<http://www.johnsdisposal.com/>

"A family business since 1969, Johns Disposal Service currently serves the counties of Dane, Jefferson, Kenosha, Milwaukee, Racine, Rock, Walworth and Waukesha."

Business Categories: (Johns) is a private company categorized under Garbage Collection. Current Manta estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 50 to 99. Products or Services: Rubbish Removal, Garbage Trash Removal, Waste Hauling, Garbage Service and Junk Removal Service.

**Kard Recycling Service Inc
(New Berlin, WI)**

Contact: <http://kardrecycling.com/blogbase/>

"We have enjoyed serving Wisconsin-area businesses and citizens since 1975. Family-owned and operated, Kard's two locations in New Berlin (Milwaukee) and Madison are convenient, secure and customer-friendly.

Kard recycles paper, plastic, aluminum and cardboard. We also perform confidential shredding of important records and other items.

Kard is bonded, insured and a member of the National Association for Information Destruction (NAID)."

Kard Recycling & Shredding in Madison, WI is a private company categorized under Recycling, Waste Materials. Manta's records show it was established in 2004 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$2.5 to 5 million and employs a staff of approximately 5 to 9.

One Source Recycling (Hobart, WI – Green Bay, WI – Janesville, WI)

Contact: 973 Haven Place # B, 54313-5262
(920) 496-5830
(Headquarters: Loves Park IL)
<http://onesourcerecycling.com/>
<http://www.manta.com/c/mm4yrh6/one-source-recycling>

“We recycle! In a cooperative effort to better serve the needs of our customers, One Source Recycling is able to accept many various materials and provide a broad variety of services. With many years experience in the recycling industry, One Source Recycling is able to offer valuable insight into your recycling needs and tailor a program that will best suit these needs.”

Business Categories: Recycling, Waste, Refuse systems; Recyclable material merchant whls.; One Source Recycling is a private company categorized under Recycling, Waste Materials. Manta's records show it was established in 2007 and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$1 to 2.5 million and employs a staff of approximately 1 to 4. Products or Services: Filter Recycling Services, Cardboard Recycling Services, Orange Recycling Services, Computer Recycling Service and Residential Recycling Services.

Paper Valley Recycling - A Division of Waste Management, Inc. (Menasha, WI)

Contact: 1420 Earl St, 54952-1417 Menasha, WI ·
(920) 729-5005

Paper Valley Recycling Center in Menasha, WI is a private company categorized under Wholesale Recycling Centers. Current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 10 to 19.

Paul's Industrial Garage (P.I.G.) (Hager City, WI)

Category: Multi-material collector + transfer station

Contact: Paul Larson, President
W9724 Highway 35, 54014
715-792-5209
pigllc@hotmail.com
www.PigSanitation.com

"P.I.G. provides reliable trash and recycling collection for residential, commercial and construction. Recyclables: Plastic: Rinse out containers. We accept number 1 - 7 plastic containers (to recognize look at the bottom of the container for the recycling symbol 1 - 7.)

"P.I.G. - Paul's Industrial Garage - We provide trash and recycling service, roll off dumpster rental and a public transfer station. Products & Services: Residential & commercial garbage service; Roll-off dumpster rental; and Public drop off/Transfer station. Employees: 10 to 19. Years in Business: 22."

Pellitteri Waste Systems (Madison, WI)

Contact: Tim Pellitteri, President
David Pellitteri, Vice President
7035 Raywood Rd, 53713
info@pellitteri.com
<http://www.pellitteri.com/>

"Pellitteri Waste Systems- Providing Superior Trash and Recycling Collection Service to Our Commercial, Industrial, and Residential Customers in the Greater Madison Area and throughout Dane County."

Business Categories: Wholesale recycling centers; and Recyclable material merchant whols. Pellitteri Waste Systems is a private company categorized under Wholesale Recycling Centers. Manta's current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 10 to 19.

See also "Case Study" 3D

Rock Disposal, Inc. (Janeseville, WI)

Contact: <http://www.rockdisposalinc.com/>

Rock Disposal, Inc. is a solid waste recycling and disposal company serving South Central Wisconsin and Northern Illinois. Mixed Waste Recycling Facility - Single stream recycling for all recycling material goes into one bin, Containers: cans, glass bottles and plastic containers.

Schulz's Recycling, Inc. (Merrill, WI)

Category: Scrap metal dealer

Contact: W6059 Heldt Street, 54452
(715) 536-7141
www.SchulzsRecycling.com

“Schulz's Recycling, Inc has been purchasing scrap metals since 1958. We are located on a 20 acre yard in Merrill with an onsite scale for your convenience. Our yard offers easy access year round to allow us to purchase all grades of ferrous and nonferrous metals. Visit our location today and bring in your old miscellaneous scrap metals or aluminum cans and receive immediate payment. Our next big evolution came from recycling services - including paper, glass, cardboard, plastic, tires and other materials banned from the landfills.”

Business Categories": Wholesale recycling centers; Whol scrap & waste materials; Automotive scrap; Recyclable material merchant. Schulz's Recycling Inc in Merrill, WI is a private company categorized under Wholesale Recycling Centers. Manta's records show it was established in 1972 and incorporated in Wisconsin. Current estimates show this pcompany has an annual revenue of \$5 to 10 million and employs a staff of approximately 10 to 19. Products or Services: Albar precious metal refining; Hazardous waste materials; Metal refinery; Metal refining services; and Radioactive waste material.

Southern Lakes Recycling, Inc. (Elhorn, WI)

Contact: 220 S Broad Street, Elkhorn, WI 53121-1802
262-723-5022

T.A. Solberg Co., Inc./Trigs Recycling Center Minoqua, WI

Contact: <http://stevens-point.trigs.com/company/>

The Scrap Man, LLC (Wisconsin Dells, WI)

Types of Plastics: "All plastic cups and containers: #1, #2, #3, #4, #5, & #7. Plastic bottles, just, jars, yogurt & cottage cheese containers, margarine & whipped topping tubs. No: plastic shopping bags, no styrofoam, no hangers."

Contact: 1897a Broadway Road, 53965
(608) 408-0618
<http://www.thescrapmanllc.com/>

“Serving the Wisconsin Dells and surrounding areas since 2003. The Scrap Man LLC is a family owned and operated business. We hold numerous EPA, DNR, DOT licenses as well as being registered through multiple state agencies for metals, plastics and hazardous waste.”

"Serving the Wisconsin Dells and surrounding areas since 2003. The Scrap Man LLC is a family owned and operated business. Continuously trying to exceed our competitors. We hold numerous EPA, DNR, DOT licenses as well as being registered through multiple state agencies for metals, plastics and hazardous waste."

Town & Country Sanitation (Boscobel, WI)

Types of Plastics: Plastic (MUST have recycling symbol 1-7). Items that can be tied together (such as milk cartons) May be placed next to bin. Please rinse. No caps or lids. Styrofoam is not recyclable.

Contact: <http://townandcountrysanitation.com/index.html>

“Town & Country Sanitation Inc. is one of Wisconsin’s fastest growing and most environmentally protective refuse handling and recycling company. Currently we serve a great majority of Southwest Wisconsin and North East Iowa. Offering a wide variety of commercial and residential services, Town & Country Sanitation offers curbside recycling services twice a month in our residential pick-up areas. This service is also offered for non-residential customers.”

Business Categories: Garbage collection; Other waste collection. Town & Country Sanitation Inc in Boscobel, WI is a private company categorized under Garbage Collection. Manta's current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of

approximately 20 to 49. Products or Services: Rubbish removal, Garbage/trash removal, Waste hauling, Garbage service and Junk removal service.

Tri-R Recycling Project (Whitehall, WI)

Contact: <http://www.tchcc.com/index.cfm/m/recycling/>

Veolia Environmental Services (Chilton, WI – Eau Claire, WI – Kenosha, WI – Marshfield, WI – Minocqua, WI – Schofield, WI – Waunakee, WI – Wisconsin Rapids, WI)

Contact: <http://www.veoliaes.com/content/veolia/en.html>

“Protecting the Environment by Turning Waste into a Resource. Finding solutions for beneficial reuse or recycling waste into new raw materials protects and preserves our environment by limiting our dependence on landfills, conserving natural resources and decreasing our community’s environmental footprint. At Veolia, turning waste into a resource, preserving the environment and improving human safety and quality of life are among of our core values. Our allegiance to environmental protection is demonstrated by our decades-long, global commitment to developing new, state-of-the-art technologies and innovative solutions for the challenges presented by recycling hazardous and non-hazardous waste materials. Drawing from our global expertise, Veolia offers safe and convenient recycling services for the whole community—from residential consumers and small businesses to large-scale commercial and industrial enterprises, as well as municipalities and government agencies.”

Waste Management, Inc. (Germantown, WI - Fon du Lac, WI - La Crosse, WI - Madison, WI - Superior, WI -)

Contact: <http://www.wm.com/>

Disposing of waste in an environmentally-friendly manner is crucial to your business. We can help. Our experts will assess your waste streams and develop the right recycling and disposal solution for you.

See also “Case Study” 3E

Janesville Recycling Center (WM) (Janesville, WI)

Contact: 340 Black Bridge Rd, Janesville, WI

Janesville Recycling Center in Janesville, WI is a private company categorized under Refuse Systems. Manta's records show it was established in and incorporated in Wisconsin. Current estimates show this company has an annual revenue of \$5 to 10 million and employs a staff of approximately 10 to 19.

Zeus Recycling Solutions (Sheboygan, WI)

Category: Collector

Types of Plastics: HDPE, LDPE, LLDPE Films, PET rolls, ABS, Acrylic, Polycarbonate, Polyvinyl.

Contact: Brady Zufelt,
1434 S. 12th Street, 53081
920-918-9648
brady@zeusrecycling.com
<http://www.zeusrecycling.com/>

“Zeus Recycling Solutions, LLC was started in 2009 and specializes in the recycling of many types of plastics and plastic wraps (for) for manufacturers and warehousing distributors. manufactures a customized manual plastic shrink wrap baler. The Zeus Baler allows companies to easily reduce their waste disposal costs by recycling plastic wrap into small 30 lb. bales”

Recycling and waste materials.

Appendix - Chapter 4
Economic and Job Development

4-A SBA Offices Serving Wisconsin

Wisconsin is in Region V of the SBA, with Regional Offices in Chicago. The state affiliate of the SBA is Wisconsin Business Development, (www.WBD.org) and offices are located at 310 W. Wisconsin Ave., Rm. 400, Milwaukee, WI and 740 Regent St., Ste. 100, Madison, WI. Specific services provided include:

- ◆ Financial assistance for new or existing businesses through guaranteed loans made by area bank and non-bank lenders.
- ◆ Free counseling, advice and information on starting, improving or expanding a small business through SCORE ,“Counselors to America’s Small Business;”
- ◆ Small Business Development Centers (SBDCs) and Women’s Business Centers (WBCs).
- ◆ Training events throughout the district. Assistance to businesses owned and controlled by socially and economically disadvantaged individuals through the Business Development Program.

The Small Business Development Center (SBDC) is a small business management and technical assistance network. SBDCs offer free one-on-one expert business advice and low-cost training by qualified small business professionals to existing and future entrepreneurs. Centers are located in Eau Claire, Green Bay, La Crosse, Madison, Milwaukee, Oshkosh, Kenosha, Platteville, River Falls, Stevens Point, Superior and Whitewater. (www.sba.gov/sbdc.)

4-B U.S. Department of Commerce

www.Grants.gov is a search engine to find grant opportunities across many federal and state funders.

MEP has an extensive network of manufacturers and suppliers to help U.S. companies meet the requirements of the “Buy America” and “Buy American” standards. This work grew out of MEP’s supplier scouting program focused on finding business opportunities for small manufacturers by matching their capabilities with the supply chain needs of original equipment manufacturers (OEMs) located in the U.S. The Buy American provision in the American Recovery and Reinvestment Act of 2009 dictates that “none of the funds appropriated or otherwise made available by the Act may be used for a project for the construction, alteration, maintenance, or repair of a public building or public work unless all the iron, steel, and manufactured goods used are produced in the United States.” This includes manufactured goods made of plastics.⁷

⁷ WMEP web page: www.nist.gov/mep/scouting

4-C Wisconsin Economic Development Corporation (WEDC)

Budget Information

The WEDC is a private entity, established by the State of Wisconsin. In fiscal year 2013 (FY13), WEDC revenues come from state general purpose revenue appropriations, segregated fund appropriations, federal program revenues, repayments from WEDC's portfolio, and private contributed dollars. Total revenues in FY13 are expected to be \$89.7 million with the primary source (\$57 million) from state of Wisconsin appropriations and \$28 million from federal sources including Community Development Block Grant (CDBG) funds. The FY13 expenditures include tax credit allocations which are 'off balance' sheet items but are commitments of future state of Wisconsin tax revenue. In FY13, WEDC may allocate up to \$25 million in economic development tax credits (subject to authorization by Joint Committee on Finance) and \$17 million in jobs tax credits. There is also \$41 million available in Qualified New Business Venture credits of which WEDC expects to commit \$12 million in FY13. In addition, there are 5 Enterprise Zones available for designation.⁸

WEDC's FY13 budget corresponds with its Operations Plan and both were approved by the WEDC Board of Directors on June 26, 2012. Table 4-3 displays an excerpt of WEDC's FY 13 budget under "Products – Aids to Business and Community". These funds are statewide & program wide....

Table 4-3
WEDC FY 13 - (Statewide)

Products - Aids to Business and Community		
Revenues	Fiscal Year 12 Estimates	Fiscal Year 13 Budget
Start-up - Technology Business Development	\$1,934,000	\$9,000,000
Start-up - Seed Fund Investments		\$900,000
Start-up - Entrepreneurship Support		\$1,000,000
Econ Devt Project -Research	\$230,000	\$300,000
Econ Devt Projects - Industry	\$775,000	\$6,200,000
Export Assistance - Market Development Grants	\$121,909	\$185,000
Export Assistance - Export Training Support		\$100,000
Expansion - Business Retention Investment	\$18,373,462	\$38,500,000
Expansion - Fed Mfg Clean Energy	\$7,190,000	\$5,000,000
Expansion - Training Grants	\$258,314	\$1,000,000
Community - CDBG Public Facilities	\$19,499,681	\$17,000,000
Community - Brownfield Redevelopment	\$1,615,500	\$4,500,000
Total Products - Aids to Business and Community	\$49,997,866	\$83,685,000

Source: WEDC Budget for FY13 (As adopted on June 26, 2012)

⁸ WEDC FY13 Operations Plan (June 2012): http://wedc.org/wp-content/uploads/2012/07/2012_WEDC_OpsPlan_final.pdf

4-D Wisconsin Manufacturing Extension Partnership (WMEP)

Case Study - Economic Development Organization:

- ◆ Functions of WMEP
- ◆ Interests and capabilities to network with plastics manufacturers, especially related to use of recycled resin

Sources:

- ◆ Interview with Randy Bertram (Profitable Sustainability Initiative Program Manager), on August 13, 2012
- ◆ WMEP web page: www.WMEP.org

The Wisconsin Manufacturing Extension Partnership (WMEP) enhances the success of Wisconsin's small to midsize manufacturers by providing expert and accessible services for growth and innovation, continuous improvement, training, export assistance, supply chain management and profitable sustainability. WMEP is a strong advocate for manufacturers in Wisconsin and supports Wisconsin manufacturing at a national level. Based in Madison, WMEP's mission is to elevate the Wisconsin manufacturing economy to be the best in the world. WMEP believes that an innovative, successful manufacturing base is the key to higher paying jobs and a higher quality of life in the state. As a strong advocate for the state's 10,000 small and midsize manufacturers, WMEP strives to transform industry through consulting services, industry studies, seminars, publications and annual the *Manufacturing Matters!* conference.

WMEP's Profitable Sustainability Initiative (PSI) program helps small and midsize manufacturers identify the most important business impacts and highest ROI that can be achieved through reaching higher profitable sustainability performance. The PSI methodology utilizes a powerful and unique process that identifies, assesses and implements profitable sustainability solutions that are custom-designed to fit a company's unique needs and objectives. The PSI method, proved in delivery to 45 Wisconsin small and midsize manufacturers, is highly effective, with rapid speed-to-benefit. Supply chain logistics is one of the PSI program's key diagnostics to establish baseline performance and prioritize opportunities for profitable sustainability improvements.

The PSI program focuses on sustainability and helps manufacturers to be more efficient. His people look at the elements of manufacturing processes, reduce residuals, reduce logistic problems, reduce waste and lower energy costs. In a plastics situation, his folks will look at percent virgin material, percent recycled content, the processes the facility uses and come up with a recommendation to save money.

Example: He is working with a polyethylene manufacturer, Bemis, in Sheboygan Falls, which is best known for its toilet seat products. The company is a pioneer of co-injection molding, a process in which virgin resin is injected with scrap plastic. (Bemis' plastic work has won a number of awards in the SPI Structural Plastics Div. design competition, particularly with the John Deere 7000 tractor, which is believed to represent the first instance of co-injection molding of large parts where a recycled engineering material (ABS) is used in the core. (Plastic News,

October 2007) He noted that this company is having such a difficult time getting clean recycled content that their employees are bringing milk jugs and plastic bags from home for the company to recycle.

He sees a significant segment of plastics recycling to be post-industrial grinds and re-sells. There is a significant energy savings per pound of material processed when using regrind. He noted that in packaging design, Quality Plastics Inc., in Fond de Lac, is using 100 per cent post-consumer content (water bottles) to make clamshells purchased by Walmart and CostCo. This company is a member of WMEP's "Profitable Sustainability Initiative."

WMEP's strength is in facilitating operational improvements. Examples of companies that he has worked with included Cycle Polymers, Bemis, and Chief Companies. In Sheboygan County WMEP is facilitating discussion of recycling of plastics between companies in the county: residuals from one company become feedstock for the next company.

WMEP has tried to work with some of the national databases for waste streams, to assist their clients in sourcing feed stocks. The work they did in Milwaukee was not successful. Mr. Bertram believes that working on the county level, as he's doing in Sheboygan County, will be much more successful. Matt Howard, the Milwaukee Sustainability Director, brought to Milwaukee a byproducts synergy system that he developed in the Washington, DC area. He was not able to build enthusiasm or interest from the M7 group or the Milwaukee County Economic Development Authority to populate the system with residual products or with requests for residuals to use. Mr. Bertram stated that there may be some concerns with competitiveness; if one puts the specifics of a company's residual stream "out there," a competitor may use that information to determine proprietary information about the company's processes. He noted that a company such as Finkle Polymers may have that concern to a greater degree than a company such as Bemis.

WMEP also works with Saco Polymers, in Sheboygan. Saco manufactures polyethylene water pipe, among other products. Its subsidiary, NWP, Inc., manufactures XR Sheet, a moldable substrate for automotive interiors (for instance, floor mats). This subsidiary can use recycled materials, and grinds on-site for its production processes.

Mr. Bertram believes that the biggest barrier to greater use of recycled plastics is the poor quality of the recycled material. He has found that roto-molding and blow-molding companies, in particular, have experienced damage to process equipment, lack of consistency in the finished product, lack of quality in finished products, and an inability to meet customer specifications if they use recycled content, especially in food service applications. He also noted that small firms have no resources to research and overcome barriers to using recycled content. The potential for damage to equipment and customer relations is too high for them to risk the unknowns associated with recycled content. A company like Bemis has the capability to do the testing, and could take a small amount of risk that a smaller or midsize company could not handle.

Mr. Bertram noted that the standards for the products that processors meet must be very high. There have been times when processors have not met OEM specifications.

He noted that coordination must occur between MRFs, processors and manufacturers. He suggested that Randy Raider, in Milwaukee, has a great deal of experience in this area. He was a plastics buyer for Briggs and Stratton, and witnessed large amounts of scrap plastic form operations that had nowhere to go.

He concluded that the two most significant challenges to increased recycling of plastics in Wisconsin are collection (i.e., supply) and the reliability of quality and quantity of the processed material.

4-E Northwest Wisconsin Manufacturing Outreach Center (NWMOC)

Case Study - Economic Development Organization:

- ◆ Functions of NWMOC
- ◆ Interests and capabilities to network with plastics manufacturers, especially related to use of recycled resin.

Sources:

- ◆ Interview with Larry Blackledge (NWMOC Director;)
- ◆ NWMOC web page: <http://www.uwstout.edu/nwmoc/about/index.cfm>

The Northwest Wisconsin Manufacturing Outreach Center (NWMOC) was established in July 1994 as part of the Federal Technology Project with the National Institute of Standards and Technology (NIST)/Hollings Manufacturing Extension Partnership (HMEP) as its statutory funding source. It was formed as a partnership between the University of Wisconsin-Stout (UW-Stout) and five technical colleges - Chippewa Valley, Nicolet Area, North Central, Western, and Wisconsin Indianhead. NWMOC is headquartered at UW-Stout in Menomonie, Wisconsin and is one of numerous specialized outreach Centers within the Stout Technology Transfer Institute (STTI) housed under the UW-Stout Discovery Center.

NWMOC is part of the MEP network, and has been working to develop a plastic cluster with the 7 Rivers Economic Development Group. This is a regional organization along the I-94 corridor, in Wisconsin, Iowa and Minnesota. One hundred and thirty two plastics and rubber manufactures are located in the Region. There are no plastics distributors locally and the small manufacturers pay higher resin prices than if they had a co-op or a regional distribution center. A significant barrier to recycled plastic in this region is the predominance of medical device manufacturers. U.W. Stout is currently doing research to evaluate the potential for use of recycled plastic in medical devices. Phillips Plastic is a company in the region that uses only virgin resin in the medical devices that they manufacture.

The mission of UW Stout is to solve real-world problems and enhance economic activity. Mr. Blackledge believes that NWMOC could be of assistance in product development by existing manufacturers that would use recycled resin. Their services are used by small to midsize manufacturers, in a concentrated area, to assist in new product development leading to new job creation. They are experts in LEAN manufacturing, have a prototyping center and a plastics

engineering department and access to a varied, talented pool of professionals for consultation of specific projects.

The Discovery Center is a three year old applied research center. The center has access to chemists, engineers, resources, faculty, student interns and other universities for product development. Value Stream Mapping is one area of expertise. Recently they assisted a company by evaluating paint chemistry and production changes and institution of LEAN practices to achieve a six-hour paint dry from the previous 12 hour dry. For plastics, these resources could be used to model, test and prove reliability and durability of a recycled resin-made part as opposed to the existing virgin-resin part.

4-F Wisconsin Business Development

Since 1982, Wisconsin Business Development (WBD) has helped fund over 2,000 businesses in Wisconsin and produced projects in 69 of 72 Wisconsin counties. This past year, WBD rose to become the 9th largest producer out of the 254 community development corporations (CDCs) in the U.S. WBD participated in projects with over 100 Wisconsin lenders and served as an integral hub in every project. Additionally, WBD bridged the constant need for access to capital markets while keeping the interests of the lender, the SBA, and more importantly the small business at the forefront.

WBD Service Company - The Wisconsin Business Development Service Company (WBD Service Company) works with community based or economic development loan fund programs. By contributing or sharing experience, WBD works to improve the delivery of community development financing within specialized or diverse business sectors. WBD helps these organizations find solutions to improve their portfolio performance and operational efficiency. WBD Service Company provides both consulting and backroom support services including: loan packaging, servicing, underwriting and risk management services.

Wisconsin Business Growth Fund - The Wisconsin Business Growth Fund (WBG Fund) raises capital for businesses located in Wisconsin's low income communities. An allocation of \$65 million under the New Markets Tax Credits (NMTC) Program through the U.S. Department of Treasury allowed WBG to focus on larger businesses willing to create opportunity and invest in Wisconsin's most underserved areas. This award resulted from WBD's strong track record of successful service to businesses located in both urban and rural areas. NMTC loans will target businesses located in low income communities and will improve opportunities available to Wisconsin's workforce.

WBD Opportunity Fund, LLC - WBD Opportunity Fund (the FUND) is a Certified Community Development Financial Institution (CDFI) providing direct loans and guarantees to small businesses throughout Wisconsin's low income communities. The Capital Access Program (CAP) is a new program available through WBD Opportunity Fund and is designed to deliver loan loss capital to lenders as they extend credit to Wisconsin's small businesses needing a credit. More information on the CAP program is found at: www.wbd.org/capital_access_program

4-G Wisconsin Economic Development Directory

There is a directory of local and regional economic development agencies throughout Wisconsin. It provides regularly updated links to local economic development authorities:

www.ecodevdirectory.com/wisconsin.htm

4-H Eco-Industrial Parks – Case Studies

The consultant team researched a series of eco-industrial parks (EIPs). The following case studies provided selected examples of this market development concept.

Cape Charles, Virginia

The Eco-Industrial Park (EIP) concept with respect to enhancing plastics recycling is to co-locate potentially dependent companies in a common area, or “park.” For example, a MRF located in the same EIP as a plastics processor would greatly reduce transportation costs to market plastic bales. Similarly, when a plastics manufacturer that utilizes at least one of the resins processed is also located in the park, more transportation synergy is achieved. With the three companies in close proximity, cooperation and synergy in ideas, product development, “just-in-time” deliveries, specialized sorting/processing for on-campus manufacturing or new manufacturing capabilities to take advantage of adjacent sorting/processing capacity are possible. Competitive advantage is obtained by all three companies, resulting in increased business development and jobs creation.

This development was part of the town’s strategy to blend job creation with environmental protection and was envisioned to blend job creation with environmental protection. In the late 1980’s three food-processing plants closed, with 1,500 jobs lost. The Northampton County Board, through a citizen task force, determined to build the “Cape Charles Sustainable Technologies Industrial Park (SITP), using a \$4.6 million voter-approved bond. In January of 2000, the first phase of the Cape Charles Sustainable Technologies Industrial Park (STIP) opened to much fanfare. It was the first industrial park of its kind in the United States. A 31,000-square-foot manufacturing/office building was complete with solar panels, protected wetlands, low-energy light and water fixtures and native landscaping. Local water resources were protected through an innovative water recycling system. In the first few years after opening, STIP leveraged another \$8 million from private companies locating there and created more than 65 new jobs. Unfortunately, some of the businesses have since closed, and the county has struggled to replace them. According to local officials, federal and state officials developed a rigorous list of sustainability criteria for how businesses in the park could operate. Apparently, these criteria are so stringent that the already small pool of potential green businesses able to locate in the park became even smaller. In addition, county officials attribute miscommunication between state and local leaders over who would lead in recruiting businesses to the park as being a major factor in its downturn. (http://www.sog.unc.edu/programs/cednc/stbi/cases/pdf/cape_charles.pdf)

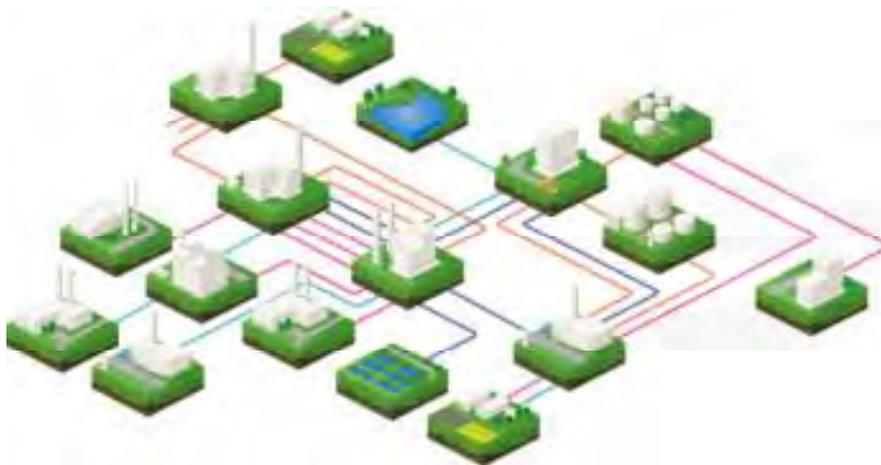
Positively, in 2006, when the Cape Charles park was struggling to maintain occupancy, the local Chamber of Commerce partnered with the area community college and the Nature Conservancy

to develop a certification course in ecotourism. Graduates of the course receive exclusive access to Nature Conservancy-owned barrier islands and can offer a more expensive and exclusive experiences to their customers. The course has been extremely successful for both the town government and local business owners.

In a current example, the state of California established specific Recycle-market development-zones in 1989 legislation. The Recycling Market Development Zone (RMDZ) program combines recycling with economic development to fuel new businesses, expand existing ones, create jobs, and divert waste from landfills. (<http://www.calrecycle.ca.gov/RMDZ/>) CalRecycle loans funds, provides technical assistance and free product marketing to eligible businesses and non-profits in designated zones. The zones cover about 88,000 square miles in California, forty separate zones are authorized. Ninety businesses that use plastic as a feed stock have taken advantage of this program.

The Kalundborg Symbiosis

The Kalundborg Symbiosis (www.symbiosis.dk/en) is an industrial ecosystem where the residual product of one enterprise is used as a resource by another enterprise in a closed cycle. An industrial symbiosis is a local collaboration where public and private enterprises buy and sell residual products, resulting in mutual economic and environmental benefits. A plan-view schematic of the Park is shown below:



In the development of the Kalundborg Symbiosis, the most important element has been healthy communication and good cooperation between the participants. The symbiosis has been founded on human relationships, and fruitful collaboration between the employees that have made the development of the symbiosis-system possible. Eleven physical linkages comprise much of the tangible aspect of industrial symbiosis in Kalundborg. The town's four main industries-Asnaes Power Station, a 1,500-megawatt coal fired power plant; a large oil refinery operated by Statoil; Novo Nordisk, a maker of pharmaceuticals and enzymes; and Gyproc, a plasterboard manufacturer and several users within the municipality trade and make use of waste streams and energy resources, and turn by-products into raw materials. Firms outside the area also participate as recipients of by-product-to-raw-material exchanges. The symbioses evolved gradually and without a grand design over the past 25 years, as the firms sought to make economic use of their

by-products and to minimize the cost of compliance with new, ever-stricter environmental regulations. Kalundborg was not explicitly designed to demonstrate the benefits of industrial symbiosis. Each link in the system was negotiated over a period of some 25 years as an independent business deal and was established only if it was expected to be economically beneficial. Benefits are measured either as positive flows by marketing a by-product (or obtaining feedstocks at prices below those for virgin materials) or as savings relative to standard pollution control approaches. This is the strength of the Kalundborg approach: business leaders have done the “right thing” for the environment in the pursuit of rational business interests. (1997. Ehrenfeld, John. Journal of Industrial Ecology, Volume 1, Number 1)

Tuen Mun (China)

The Eco Park (ecopark@epd.gov.hk) located in Tuen Mun Area 38, on the west side of Hong Kong, is similar to an industrial park exclusively for waste recycling and environmental engineering. This is the first of its kind in Hong Kong. The EcoPark occupies 200,000 square meters of land and was developed in two phases. In the document "A Policy Framework for the Management of Municipal Solid Waste (2005-2014)" published in 2005, the Government set out a strategy on waste management that places emphasis on waste reduction and recovery. As pledged in the Policy Framework, Phase I of EcoPark was implemented in 2006 (80,000 square meters) and Phase II (120,000 square meters) in 2009. Hong Kong Government funding was used to build the basic infrastructure.

The EcoPark is divided into lots of different sizes. Lots in the EcoPark were intended for specific recovered materials and processes that help achieve Hong Kong’s government waste management objectives, in particular, in recycling local wastes. Admission criteria were developed with priority given to processes involving value-added technologies, and target materials of the proposed Producer Responsibility Schemes.

Phase I tenants include:

- ◆ Champway Technology Limited - Recycling of waste cooking oil into biodiesel
- ◆ Li Tong Group - Recycling of waste computer equipment
- ◆ Shiu Wing Steel Limited - Recycling of waste metals
- ◆ Hong Kong Hung Wai Wooden Board Company - Recycling of waste wood
- ◆ Hong Kong Telford Envirotech Company Limited - Recycling of waste plastics
- ◆ Cosmos Star Company Limited - Recycling of car batteries

The EcoPark provides affordable and long term land for use by the recycling and environmental industry to encourage investment in advanced and cost-effective technologies. Such arrangements also help lowering the tenants' capital investment, so that their cashflow is more effectively used for injection to their business development.

4-1 Waukesha County (WCDEC)

Case Study:

- ◆ Manufacturer locating in Brookfield, WI
- ◆ Example of a local economic development resources

Source:

Greater Brookfield Chamber of Commerce newsletter

An example of this occurred when a German manufacturer, Thomas Magnete, was searching for a North American production headquarters in SE Wisconsin. Representatives of Waukesha County Economic Development Corporation (WCEDC), the City of Brookfield, Milwaukee County and the State of Wisconsin worked to locate them in the County. The company manufactures fluid power devices for the automotive, machinery, construction and agricultural equipment markets. The projected job growth of 27 jobs along with a \$3MM investment by Thomas Magnete USA was a beginning, but the next phase of this project was ensuring long-term growth of the company as it occupied the facility, hired a workforce and developed relationships in the community. The Greater Brookfield Chamber of Commerce connected the leadership of Thomas Magnete USA to resources in Brookfield and Waukesha County that benefit both the manufacturer, the membership of the chamber and the region.

Appendix –Chapter 5 Tables

5-A Plastics Remaining in the Waste Stream

(Tons in 2009⁹ as derived from the DNR 2009 Wisconsin State-Wide Waste Characterization Study)

ID	Plastic Type	Residential	ICI	C&D	Total	Percent of all Plastics in Waste Stream
PET Bottles/Jars:						
10	PET Beverage Bottles	7,993	9,302	39	17,334	3.0%
11	PET Non-Beverage Bottles/Jars	2,721	2,093	43	4,857	0.8%
	Subtotal of All PET Bottles/Jars	10,714	11,395	82	22,191	3.9%
HDPE Bottles/Jars:						
12	HDPE Natural Bottles/Jars	2,584	2,903	50	5,537	1.0%
13	HDPE Colored Bottles	4,286	3,501	64	7,851	1.4%
	Subtotal of All HDPE Bottles/Jars	6,870	6,404	114	13,388	2.3%
14	Other Plastic #3-#7 Bottles	2,601	1,661	30	4,292	0.7%
	Subtotal of all bottles/jars	20,185	19,460	226	39,871	6.9%
17	Other Rigid Plastic Packaging	18,929	43,264	789	62,982	11.0%
	Subtotal of all rigid containers	39,114	62,724	1,015	102,853	17.9%
	<i>(Percent by sector)</i>	<i>38.0%</i>	<i>61.0%</i>	<i>1.0%</i>	<i>100.0%</i>	
Film:						
18	Plastic Shopping Bags, Film	6,025	4,313	87	10,425	1.8%
	<i>(Percent of total film)</i>	<i>2.6%</i>	<i>1.8%</i>	<i>0.04%</i>		
19	Plastic Industrial Film Packaging	1,455	42,420	224	44,099	7.7%
20	Agricultural Plastic Film	526	8,662	41	9,229	1.6%
21	Other Plastic Film	57,772	111,221	1,174	170,167	29.6%
	Subtotal of All Film	65,778	166,616	1,526	233,920	40.7%
	<i>(Percent by sector)</i>	<i>28.1%</i>	<i>71.2%</i>	<i>0.7%</i>	<i>100.0%</i>	

⁹ Totals in this table do not match the totals reported in the DNR 2009 Wisconsin State-Wide Waste Characterization Study (Table 3-1) because that Characterization Study was not able to identify the source of some sample loads that came from transfer stations. The totals in this table are derived from the individual sectors tables in the Characterization Study (Tables 3-4, 3-9, 3-12). These numbers shown in this Plastics Recycling Study have been determined to be reasonable reflection of the data reported in the Characterization Study and adequate for this preliminary planning and this report. Additional recyclable plastic materials characterization will be needed for specific facility design or business planning efforts.

ID	Plastic Type	Residential	ICI	C&D	Total	Percent of all Plastics in Waste Stream
Polystyrene:						
15	Food Polystyrene Foam	6,350	10,406	114	16,870	2.9%
16	Other Polystyrene Foam	3,830	9,676	77	13,583	2.4%
	Subtotal of All Polystyrene	10,180	20,082	191	30,453	5.3%
	<i>(Percent by sector)</i>	<i>33.4%</i>	<i>65.9%</i>	<i>0.6%</i>	<i>100.0%</i>	
Other Plastics:						
22	Other Plastic	27,844	40,462	627	68,933	12.0%
23	Composite (with other materials)	49,921	83,914	4,344	138,179	24.1%
	Subtotal of Other Plastics	77,765	124,376	4,971	207,112	36.1%
	<i>(Percent by sector)</i>	<i>37.5%</i>	<i>60.1%</i>	<i>2.4%</i>	<i>100.0%</i>	
Total Plastics in Waste Stream		192,837	373,798	7,703	574,338	100.0%
	<i>(Percent by sector)</i>	<i>33.6%</i>	<i>65.1%</i>	<i>1.3%</i>	<i>100.0%</i>	

Source: DNR 2009 Wisconsin State-Wide Waste Characterization Study

5-B Potential Diversion Rates by 2020

(Percent of 2009 tonnages from Appendix 5-A as a the baseline year)

Plastic Type	Residential	ICI	C&D
PET Bottles/Jars:			
10 PET Beverage Bottles	75%	65%	30%
11 PET Non-Beverage Bottles/Jars	50%	40%	10%
HDPE Bottles/Jars:			
12 HDPE Natural Bottles/Jars	75%	50%	30%
13 HDPE Colored Bottles	40%	30%	10%
Other Bottles/Jars and Rigid Plastics:			
14 Other Plastic #3-#7 Bottles	40%	30%	10%
17 Other Rigid Plastic Packaging	20%	20%	10%
Film:			
18 Plastic Shopping Bags, Film (Percent of total film)	50%	40%	30%
19 Plastic Industrial Film Packaging	30%	20%	10%
20 Agricultural Plastic Film	10%	20%	20%
21 Other Plastic Film	10%	10%	10%
Polystyrene:			
15 Food Polystyrene Foam	30%	20%	10%
16 Other Polystyrene Foam	30%	20%	10%
Other Plastics:			
22 Other Plastic	20%	25%	10%
23 Composite (with other materials)	5%	11%	5%

5-C Potential Diversion Planning Targets by 2020

(Tons per year diverted from disposal by 2020 based on diversion rates in Appendix 5-B and 2009 baseline year tons in Appendix 5-A.)

Plastic Type		Residential	ICI	C&D	Total	Percent of Total Diversion
PET Bottles/Jars:						
10	PET Beverage Bottles	6,000	6,000		12,000	12.0%
11	PET Non-Beverage Bottles/Jars	1,000	1,000		2,000	2.0%
	Subtotal of All PET Bottles/Jars	7,000	7,000		14,000	14.0%
HDPE Bottles/Jars:						
12	HDPE Natural Bottles/Jars	2,000	1,000		3,000	3.0%
13	HDPE Colored Bottles	2,000	1,000		3,000	3.0%
	Subtotal of All HDPE Bottles/Jars	4,000	2,000		6,000	6.0%
14	Other Plastic #3-#7 Bottles	1,000			1,000	1.0%
	Subtotal of all Bottles/Jars	12,000	9,000		21,000	21.0%
17	Other Rigid Plastic Packaging	4,000	9,000		13,000	13.0%
	Subtotal of all rigid containers	16,000	18,000		34,000	34.0%
	<i>(Percent by sector)</i>	<i>47.1%</i>	<i>52.9%</i>		<i>100.0%</i>	
Film:						
18	Plastic Shopping Bags, Film	3,000	2,000		5,000	5.0%
	<i>(Percent of total film)</i>	<i>9.4%</i>	<i>6.3%</i>			
19	Plastic Industrial Film Packaging		8,000		8,000	8.0%
20	Agricultural Plastic Film		2,000		2,000	2.0%
21	Other Plastic Film	6,000	11,000		17,000	17.0%
	Subtotal of All Film	9,000	23,000		32,000	32.0%
	<i>(Percent by sector)</i>	<i>28.1%</i>	<i>71.9%</i>		<i>100.0%</i>	
Polystyrene:						
15	Food Polystyrene Foam	2,000	2,000		4,000	4.0%
16	Other Polystyrene Foam	1,000	2,000		3,000	3.0%
	Subtotal of All Polystyrene	3,000	4,000		7,000	7.0%
	<i>(Percent by sector)</i>	<i>42.9%</i>	<i>57.1%</i>		<i>100.0%</i>	
Other Plastics:						
22	Other Plastic	6,000	10,000		16,000	16.0%
23	Composite (with other materials)	2,000	9,000		11,000	11.0%
	Subtotal of Other Plastics	8,000	19,000		27,000	27.0%
	<i>(Percent by sector)</i>	<i>29.6%</i>	<i>70.4%</i>		<i>100.0%</i>	
Total Plastics Diverted per Year		36,000	64,000		100,000	100.0%
	<i>(Percent by sector)</i>	<i>36.0%</i>	<i>64.0%</i>		<i>100.0%</i>	

**5-D Improvement Options:
Potential Implementation Tactics and Potential DNR Role**

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.1		Plastics Recycling Implementation Plan:	<ul style="list-style-type: none"> ◆ Use this study to introduce the concept of an implementation plan ◆ Outreach and PR needs to solicit comments for interested parties as early as possible ◆ Complete the plan by June 1, 2013 	<ul style="list-style-type: none"> ◆ Convener, facilitator and staff support ◆ Identify and secure staff resources
5.3.1.1	1	Establish plastics management hierarchy	<ul style="list-style-type: none"> ◆ Use this study to explore the concept of a plastics management hierarchy. 	<ul style="list-style-type: none"> ◆ Convener, facilitator and staff support ◆ Document comments on option of hierarchy
5.3.1.2	2	Establish new diversion planning targets (e.g., "Divert 100,000 additional tons of plastic by 2020)	<ul style="list-style-type: none"> ◆ Define diversion rates (vs. recycling rates) ◆ Estimate rates for each option/scenario ◆ Estimate rate for 2020 (e.g., 100,000 tons) ◆ Estimate rates by year through 2020 	<ul style="list-style-type: none"> ◆ Set planning targets ◆ Monitor annual progress in terms of program development and waste composition as disposed ◆ Report annual progress and recommend annual work plan or policy changes
5.3.1.3	3	Plan for phased increase in municipal collection of plastics : <ul style="list-style-type: none"> ◆ All plastic bottles by end of 2014 ◆ All rigid plastic containers by end of 2016 	<ul style="list-style-type: none"> ◆ Survey RUs for willingness / ability to meet these interim goals. 	<ul style="list-style-type: none"> ◆ Coordinate planning and development of interim goals
5.3.1.4	4	Plan for enhanced plastic film/bag recycling program. (See also option #14 for implementation work.)	<ul style="list-style-type: none"> ◆ Develop detailed work plan and budget with assistance of FFRG and PlasticFilmRecycling.org. ◆ Scope film/bag characterization study. ◆ Establish goals for retail drop-off service (e.g., largest 25 cities by end of 2014) ◆ Solicit support from potential trade association partners ◆ Solicit RUs and local communities as partners ◆ Consider proposals for mandatory "take back" and recycled content requirements 	<ul style="list-style-type: none"> ◆ Continued leadership as state coordinator of FFRG pilot project. ◆ Secure additional partners, especially for funding. ◆ Other planning and R&D as needed

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.1.5	5	Measure progress towards goals	<ul style="list-style-type: none"> ◆ Develop a detailed work plan and budget for waste characterization and capture rate studies ◆ Develop an "improvement scorecard" for RU program improvements (e.g., plans to expand list of plastics, away from home systems, plastic bag drop-offs, etc.) 	<ul style="list-style-type: none"> ◆ Establish clear goals and measurement plans ◆ Ensure availability of staff and other resources to track metrics
5.3.2		Staffing, Organizing & Communications/PR:		
5.3.2.1	6	Hire a market development specialist		<ul style="list-style-type: none"> ◆ DNR needs to advocate for the position ◆ Creative financing may be available
5.3.2.2	7	Establish a (public - private) Wisconsin plastics recycling council	<ul style="list-style-type: none"> ◆ Membership should include "movers & shakers" (individuals willing to implement) ◆ Council should be more than just "advisory" ◆ Need leaders willing to help move the systems forward ◆ Informal (interim) steering committee could help during formulative period ◆ Steering committee could be one outcome of half-day forum 	<ul style="list-style-type: none"> ◆ Should lead initial development of the council ◆ Council could advise DNR and assist with networking, outreach and PR ◆ DNR to staff Council and provide funds for communication
5.3.2.3	8	Conduct initial outreach, organizing and public relations	<ul style="list-style-type: none"> ◆ Half day forum ◆ Web page ◆ News release ◆ Send out hard copies of Executive Summary to interviewees and other key stakeholders 	<ul style="list-style-type: none"> ◆ Plan and host the forum ◆ Develop and produce the web page ◆ Send out news release ◆ Send out copies of Executive Summary
5.3.3		Feasibility Studies:		
5.3.3.1	9	Conduct rigids PRF feasibility study	<ul style="list-style-type: none"> ◆ Review study scope with existing Wisconsin markets (e.g., types of plastics limited to mixed plastic bales?) ◆ Enlist cooperation of larger MRFs and current Wisconsin markets ◆ May need to conduct pre-feasibility characterization (e.g., audits of mixed plastic bales, etc.) 	<ul style="list-style-type: none"> ◆ Initiate through a RFEI process ◆ Request responders to itemize the information they need to submit a full proposal ◆ Develop a example state / local assistance package ◆ Industry financing may be available

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.3.2	10	Film PRF feasibility study	<ul style="list-style-type: none"> ◆ Review study scope with existing Wisconsin markets (e.g., types of beyond PE film?) ◆ Enlist cooperation of larger MRFs and current Wisconsin markets ◆ May need to conduct pre-feasibility characterization (e.g., audits of larger film generators, etc.) 	<ul style="list-style-type: none"> ◆ Initiate through a RFEI process ◆ Request responders to itemize the information they need to submit a full proposal ◆ Develop a example state / local assistance package ◆ Industry financing may be available
5.3.4		Enhance Collection and Processing:		
5.3.4.1	11	Expand single stream recycling systems	<ul style="list-style-type: none"> ◆ Additional info exchange between public and private MRFs in Wisconsin. 	<ul style="list-style-type: none"> ◆ Continued info & technology exchange (e.g., case studies)
5.3.4.2	12	Enhance away from home recycling systems. (See also option #18 for technical assistance efforts.)	<ul style="list-style-type: none"> ◆ Continue to research and pilot "best practices" (e.g., RAM's "Message in a Bottle" program) ◆ Seek partnering opportunities 	<ul style="list-style-type: none"> ◆ R&D on "best practices" ◆ Info & technology exchange ◆ Document case studies
5.3.4.3	13	Increase use of automated sorting equipment	<ul style="list-style-type: none"> ◆ Continue to assess needs of MRFs for automated sorting equipment. ◆ Seek alternative funding sources. ◆ Propose capital assistance program. 	<ul style="list-style-type: none"> ◆ Leadership in identifying needs and cost estimates. ◆ Development of funding options. ◆ Solicit advice and support from funding sources.
5.3.4.4	14	Enhance plastic bag and film recycling. (See also option #4 for planning work.)	<ul style="list-style-type: none"> ◆ Characterize film/bag volumes as disposed and as recycled ◆ Implement FFRG pilots ◆ Require environmental preferable purchasing of recycled products (e.g., plastic lumber, etc.) by public entities 	<ul style="list-style-type: none"> ◆ Planning, coordination ◆ Supervise FFRG pilot project ◆ Monitor and report on progress towards goals
5.3.5		Enhance Technical Assistance to RUs, MRFs + Other Suppliers:	<ul style="list-style-type: none"> ◆ DNR web site becomes a communication hub. 	
5.3.5.1	15	Promote standardized definitions and bale specs	<ul style="list-style-type: none"> ◆ Reference industry specs (e.g., APR, ISRI, etc.) [i.e., Do NOT create WI unique definitions or specs!] ◆ Promote and link to industry trade groups 	<ul style="list-style-type: none"> ◆ Disseminate industry specs ◆ Monitor industry spec developments (e.g., APR)

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.5.2	16	Promote standardized public education outreach messaging	<ul style="list-style-type: none"> ◆ Reference other "state-of-the-art" public education tool kits, examples, etc. (e.g., photos, short descriptions, etc.) ◆ Develop public education requirements ◆ Work with industry and RUs as advisors to develop guidelines 	<ul style="list-style-type: none"> ◆ Coordinate development of guidelines ◆ Use Wisconsin plastics recycling council as sounding board
5.3.5.3	17	Promote recyclable materials directories and exchanges	<ul style="list-style-type: none"> ◆ Add new listings identified in this study ◆ Split "markets" (i.e., reclaimers + end-use manufacturers) from "suppliers" (i.e., MRFs, scrap dealers, and other plastic handlers) 	<ul style="list-style-type: none"> ◆ Advise, direct and help finance enhancements to SHWEC's <i>Directory</i> ◆ Continue to use the <i>Directory</i> as a communications tool (e.g., solicit corrections, improvements and new listings)
5.3.5.4	18	Promote enhanced away from home recycling systems (See also option #12 for collection enhancements.)	<ul style="list-style-type: none"> ◆ Continue to research and pilot "best practices" (e.g., RAM's "Message in a Bottle" program) ◆ Seek partnering opportunities 	<ul style="list-style-type: none"> ◆ R&D on "best practices" ◆ Info & technology exchange ◆ Document case studies
5.3.6		Enhance Financing, Supply Assurance and Siting		
5.3.6.1	19	Leverage Existing Financial Assistance	<ul style="list-style-type: none"> ◆ Partner with WEDC. Develop a specific package of proposed initiatives. 	<ul style="list-style-type: none"> ◆ Referrals to appropriate funding agencies. ◆ Outreach to specific individuals at key organizations.
5.3.6.2	20	Provide Additional Financial Assistance to Markets	<ul style="list-style-type: none"> ◆ Develop a detailed work plan and budget for new plastics recycling capital assistance fund. ◆ Meet with WEDC to discuss alternative financing tools and determine if a dedicated account is feasible 	<ul style="list-style-type: none"> ◆ Schedule a summit meeting with WEDC and DNR Commissioner
5.3.6.3	21	Promote Enhanced Supply Assurance Mechanisms	<ul style="list-style-type: none"> ◆ Interview additional existing and potential new markets about need for supply assurance. ◆ Propose mandate links to other options (e.g, financial assistance option #17). 	<ul style="list-style-type: none"> ◆ Seek better understanding of current market dynamics and if government intervention is needed and/or appropriate.
5.3.6.4	22	Promote Eco-Industrial Parks	<ul style="list-style-type: none"> ◆ Meet with City of Milwaukee. ◆ Continue discussions with Waukesha County. 	<ul style="list-style-type: none"> ◆ Continued research, communications, and referrals.

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.7		Promote development of domestic market capacity (especially in Wisconsin):		
5.3.7.1	23	Develop new plastics sorting & reclamation capacity in Wisconsin	<ul style="list-style-type: none"> ◆ Develop an RFEI for sorting & reclaiming capacity for mixed plastic bales. ◆ Use responses from RFEI to secure funding partners. ◆ If funding is secured, release an RFP for a specific facility scope. 	<ul style="list-style-type: none"> ◆ Market development lead, but partner with economic development authorities at the state (e.g., WEDC) and local levels.
5.3.7.2	24	Promote APR's "Fit for Use" initiative	<ul style="list-style-type: none"> ◆ Reference and promote APR's "Fit for Use" guidelines 	<ul style="list-style-type: none"> ◆ Review & comment on APR's guidelines ◆ Assist in outreach and education
5.3.7.3	25	Promote recycled content strategies	<ul style="list-style-type: none"> ◆ Identify current or potential recycled content products 	<ul style="list-style-type: none"> ◆ Promote recycled content strategies ◆ Assist in outreach/education
5.3.7.4	26	Promote "buy recycled"	<ul style="list-style-type: none"> ◆ Identify current recycled content products made in Wisconsin. 	<ul style="list-style-type: none"> ◆ Promote Wisconsin - made recycled products.
5.3.8		Promote Other Voluntary Producer Responsibility Options:		
5.3.8.1	27	Form a private Wisconsin plastics recycling corporation (WPRC)	<ul style="list-style-type: none"> ◆ Propose an executive committee to serve as Wisconsin's formulative organization ◆ Use "Carton Council" as model ◆ 	<ul style="list-style-type: none"> ◆ Float the concept among private plastics recyclers ◆ Suggest that an independent, private corporation may be able to better respond to market dynamics ◆ Propose private funding / investments will be needed to accomplish goals
5.3.8.2	28	Promote reverse vending machines (e.g., <i>Dream Machines</i>)	<ul style="list-style-type: none"> ◆ Contact PepsiCo and WM and ask for coverage/distribution and tonnage performance data. 	<ul style="list-style-type: none"> ◆ Support and encourage through referrals and web links
5.3.8.3	29	Promote design for recyclability	<ul style="list-style-type: none"> ◆ Review and comment on APR's design for recyclability (DFR) guidelines. ◆ Provide info & technology exchange on DFR 	<ul style="list-style-type: none"> ◆ DNR could provide technical assistance and encourage DFR. ◆ Monitor and publish links to any updates to APR's DFR guidelines (e.g, for film/bags).
5.3.9		Develop Alternative Recovery Technologies:		

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.9.1	30	Waste to energy	<ul style="list-style-type: none"> ◆ Further case study work on use of plastic pellets as a fuel supplement ◆ Estimate current and potential diversion 	<ul style="list-style-type: none"> ◆ Identify current permitted operations ◆ Extrapolate under encouraged growth scenario to estimate state-wide potential
5.3.9.2	31	Plastics to oil	<ul style="list-style-type: none"> ◆ Detailed case study write-ups on current status of PTO facilities. ◆ Estimate potential diversion and costs 	<ul style="list-style-type: none"> ◆ Continue R&D and monitoring of technology
5.3.10		Enhance Disposal Bans:		
5.3.10.1	32	Enhance enforcement of existing disposal bans	<ul style="list-style-type: none"> ◆ Itemize state and local resources needed ◆ Provide additional technical assistance to RUs to help improve local enforcement of Compliance Assurance Plans ◆ Enhance technical assistance to RUs to improve effective recycling program standards and performance 	<ul style="list-style-type: none"> ◆ Continued planning on a voluntary basis ◆ Develop specific proposal if legislation is needed.
5.3.10.2	33	Expand disposal bans to include additional plastics	<ul style="list-style-type: none"> ◆ Phased approach to disposal bans, including (but not limited to): ◆ Non-bottle PET and HDPE by end of 2014 ◆ All bottles by end of 2014 ◆ All rigid containers by end of 2016 ◆ Bags and other PE film by end of 2016 ◆ Bulky rigid materials by end of 2016 ◆ Schedule based on diversion targets as triggers 	<ul style="list-style-type: none"> ◆ Assist in developing proposal
5.3.11		Propose New Mandatory Options:		
5.3.11.1	34	Consider Container deposits	<ul style="list-style-type: none"> ◆ Plan for integrated deposits + curbside systems ◆ Unredeemed deposits managed by third-party, non-profit (e.g., WPRC, see option #35) ◆ Dedicated, revolving funds ◆ Put deposit on <u>all</u> beverage <u>and</u> food containers 	<ul style="list-style-type: none"> ◆ Assist in developing pre-conditions: ◆ Must be integrated with and provide financial support to municipal / RU curbside and drop-off collections and MRFs ◆ Funds from unredeemed deposits must be dedicated ◆ (c) Managed by a third party non-profit

Report Section Number	Option ID Number	Option	Implementation Tactics	Potential DNR Role
5.3.11.2	35	Consider extended producer responsibility mandates	<ul style="list-style-type: none"> ◆ Determine specific plastic containers and bags to target ◆ Require specific actions (e.g., development of mixed bale and film/bag sorting/processing capacity) ◆ If actions are not taken, impose sales tax and required WPRC (see option #35) to implement mandated actions 	<ul style="list-style-type: none"> ◆ Research case study models ◆ Assist in developing more detailed concept to Wisconsin situation
5.3.11.3	36	Consider additional landfill surcharges	<ul style="list-style-type: none"> ◆ Set clear and measurable goals for use of funds (e.g., developing a rigid PRF; developing a film/bag PRF) ◆ Increase current landfill surcharge to pay for expanded market development efforts, or ◆ Dedicate a greater share of existing surcharge funds to market development 	<ul style="list-style-type: none"> ◆ Assist in development of a specific proposal ◆ Assist in working with prospective partners (e.g., private plastics recyclers; WEDC; etc.)
5.3.11.4	37	Consider advanced disposal fees	<ul style="list-style-type: none"> ◆ State product sales taxes dedicated to fund recycling programs ◆ Placed on items with largest contribution to waste stream as disposed ◆ Require formation of WPRC (option #35) to manage funds 	<ul style="list-style-type: none"> ◆ Assist in development of a specific proposal ◆ Assist in working with prospective partners (e.g., private plastics recyclers; manufacturers; etc.)
5.3.11.5	38	Consider sales bans	<ul style="list-style-type: none"> ◆ E.g., "bag bans" ◆ Ban of non-recyclable items per industry design for recyclability (DFR) standards (e.g., replace contaminating labels with suitable non-contaminating alternatives) 	<ul style="list-style-type: none"> ◆ Assist in working with prospective partners (e.g., private plastics recyclers; manufacturers; etc.) ◆
5.3.11.6	39	Consider mandatory recycled content policies	<ul style="list-style-type: none"> ◆ Review previous attempts to mandate recycled content ◆ Identify alternatives to mandates 	<ul style="list-style-type: none"> ◆ Assist in development of a specific proposal ◆ Assist in working with prospective partners (e.g., private plastics recyclers; manufacturers; etc.)
5.3.11.7	40	Consider mandatory film/bag "take back" requirements	<ul style="list-style-type: none"> ◆ E.g., require ag bag film installers to take back used film ◆ Require all retailers to take back bags ◆ Require all pallet wrap distributors to take back their material 	<ul style="list-style-type: none"> ◆ Assist in development of a specific proposal ◆ Assist in working with prospective partners (e.g., private plastics recyclers; manufacturers; etc.)

**5-E Improvement Options:
Preliminary Evaluation and Estimates of Tons, Costs and Jobs**

Note: these are preliminary estimates to be used for high level planning purposes. More detailed analyses would be need to conducted for options selected for further consideration

Report Section Number	Option ID Number	Option	Estimated New Tons/Year Diverted	State's Estimated Start-Up Cost	State's Estimated Annual Operating Cost (or Revenue)	Estimated Potential New Jobs
IMPLEMENTATION PLANNING PHASE (INCLUDING ORGANIZING AND FEASIBILITY STUDIES)						
5.3.1		Plastics Recycling Implementation Plan:				
5.3.1.1	1	Establish plastics management hierarchy	NA	Assign to existing staff.	\$0	NA
5.3.1.2	2	Establish new diversion targets (e.g., "Divert 100,000 additional tons of plastic by 2020)	NA	Assign to existing staff.	\$0	NA
5.3.1.3	3	<ul style="list-style-type: none"> ◆ Plan for phased increase in municipal collection of plastics : ◆ All plastic bottles by end of 2014 ◆ All rigid plastic containers by end of 2016 	NA	\$5,000	\$0	NA
5.3.1.4	4	Plan for enhanced plastic film/bag recycling program. (See also option #14 for implementation work.)	NA	\$5,000	\$0	NA
5.3.1.5	5	Measure progress towards goals: <ul style="list-style-type: none"> ◆ Waste characterization studies (every two years) ◆ Program reviews 	NA	Assign to existing staff.	\$100,000	2
5.3.2		Staffing, Organizing & Communications/PR:				
5.3.2.1	6	Hire a market development specialist	NA	\$90,000	\$90,000	NA

Report Section Number	Option ID Number	Option	Estimated New Tons/Year Diverted	State's Estimated Start-Up Cost	State's Estimated Annual Operating Cost (or Revenue)	Estimated Potential New Jobs
5.3.2.2	7	Establish a Wisconsin plastics recycling council	NA	Performed by market development specialist	\$10,000	NA
5.3.2.3	8	Conduct initial outreach, organizing and public relations	NA	Performed by market development specialist	\$10,000	NA
5.3.3		Feasibility Studies:				
5.3.3.1	9	Rigids PRF feasibility study	NA	\$25,000	\$0	NA
5.3.3.2	10	Film PRF feasibility study	NA	\$25,000	\$0	NA
STATUS QUO SCENARIO						
5.3.4		Continued Rate of Growth of Collection and Processing Systems:				
5.3.4.1	11	Continued growth of single stream recycling systems	5,000	\$0	\$0	25
5.3.4.2	12	Continued growth of away from home recycling systems. (See also option #18 for technical assistance efforts.)	1,000	\$0	\$0	50
5.3.4.3	13	Continued growth of use of automated sorting equipment	3,000	\$0	\$0	25
5.3.4.4	14	Continued growth of plastic film & bag recycling. (See also option #4 for planning work.)	3,000	\$0	\$0	50
PARTNERSHIP-ORIENTED SCENARIO						
5.3.5		Enhance Technical Assistance to RUs, MRFs + Other Suppliers:				
5.3.5.1	15	Promote standardized definitions and bale specs	1,000	Performed by market development specialist	\$10,000	5
5.3.5.2	16	Promote standardized public education outreach messaging	1,000	Refocus existing public education efforts.	\$10,000	5

Report Section Number	Option ID Number	Option	Estimated New Tons/Year Diverted	State's Estimated Start-Up Cost	State's Estimated Annual Operating Cost (or Revenue)	Estimated Potential New Jobs
5.3.5.3	17	Promote recyclable materials directories and exchanges	1,000	Performed by market development specialist	\$10,000	5
5.3.5.4	18	Promote enhanced away from home recycling systems. (See also option #12 for collection enhancements.)	5,000	\$50,000	\$10,000	100
5.3.6		Enhance Financing, Supply Assurance and Siting				
5.3.6.1	19	Leverage Existing Financial Assistance	NA	Assign to existing staff.		NA
5.3.6.2	20	Provide Financial Assistance to Markets	NA	Assign to existing staff.		NA
5.3.6.3	21	Enhance Supply Assurance Mechanisms	NA	\$10,000		NA
5.3.6.4	22	Promote Eco-Industrial Parks (EIPs)	NA	Assign to existing staff.		NA
5.3.7		Promote development of domestic market capacity (especially in Wisconsin):				
5.3.7.1	23	Develop new plastics sorting & reclamation capacity in Wisconsin	NA	\$75,000		NA
5.3.7.2	24	Promote APR's "Fit for Use" initiative	NA	Assign to existing staff.		NA
5.3.7.3	25	Promote recycled content strategies	NA	Assign to existing staff.		NA
5.3.7.4	26	Promote "buy recycled"	NA	Assign to existing staff.		NA
5.3.8		Promote Other Voluntary Producer Responsibility Options:				
5.3.8.1	27	Form a Wisconsin plastics recycling corporation	NA	\$75,000		NA
5.3.8.2	28	Promote reverse vending machines (e.g., <i>Dream Machines</i>)	700	Assign to existing staff.		20
5.3.8.3	29	Promote design for recyclability (DFR)	4,000	Assign to existing staff.		NA

Report Section Number	Option ID Number	Option	Estimated New Tons/Year Diverted	State's Estimated Start-Up Cost	State's Estimated Annual Operating Cost (or Revenue)	Estimated Potential New Jobs
5.3.9		Develop Alternative Recovery Technologies:				
5.3.9.1	30	Waste to energy (WTE)	50,000	\$75,000	\$30,000	50
5.3.9.2	31	Plastics to oil (PTO)	50,000	\$40,000	\$20,000	50
POLICY-ORIENTED SCENARIO						
5.3.10		Enhance Disposal Bans:				
5.3.10.1	32	Enhance enforcement of existing disposal bans	15,000	\$200,000	\$150,000	55
5.3.10.2	33	Expand disposal bans to included additional plastics	10,000			40
5.3.11		Propose New Mandatory Options:				
5.3.11.1	34	Container deposits	8,000	\$50,000		200
5.3.11.2	35	Extended producer responsibility mandates	50,000	\$50,000	\$10,000	30
5.3.11.3	36	Consider additional landfill surcharges	Negligible	\$50,000	\$10,000	NA
5.3.11.4	37	Consider advanced disposal fees	Negligible	\$50,000	\$10,000	NA
5.3.11.5	38	Consider sales bans	5,000	\$50,000	\$10,000	NA
5.3.11.6	39	Consider mandatory recycled content policies	5,000	\$50,000	\$10,000	NA
5.3.11.7	40	Consider mandatory film/bag "take back" requirements	25,000	\$50,000	\$10,000	50